



Airsoft



Name \_\_\_\_\_

All Airsoft activities must be done under the safety requirements of the *Trail Life USA Health and Safety Guide* and the *Shooting Sports Guidebook*.

**Do all of the following requirements (1-5)**

- \_\_\_\_1. Complete the Navigator or Adventurer Shooting Sports Orientation.
- \_\_\_\_2. Participate in an Airsoft orientation that covers the following:
  - \_\_\_\_a. Description of Airsoft and basic rules
  - \_\_\_\_b. Safe Zones
  - \_\_\_\_c. Field Conduct including:
    - \_\_\_\_i. Expected behavior when a player is Hit
    - \_\_\_\_ii. Expected behavior by Deadmen
    - \_\_\_\_iii. Appropriate action against players fighting over a disputed call
    - \_\_\_\_iv. All hits against the body and gear, except the gun, are considered Hits
    - \_\_\_\_v. **Calling "Blind Man" to stop the game for an** emergency or inability to see
  - \_\_\_\_d. When to call Surrender and at what distance
  - \_\_\_\_e. Maximum BB velocity in feet per second (FPS) or meters per second (MPS) for indoor and outdoor games including close quarters combat(CQB) based on BB weight for the following weapons:
    - \_\_\_\_i. Standard Airsoft gun
    - \_\_\_\_ii. Sniper Rifle
    - \_\_\_\_iii. Claymore mines
    - \_\_\_\_iv. Hand Grenades (Spring or Gas)
    - \_\_\_\_v. M203 launched Grenades
    - \_\_\_\_vi. Exotic Weapons
- \_\_\_\_3. Participate in an Airsoft safety orientation and do the following:

- \_\_\_\_\_a. Recite from memory the three rules of the *Gold Standard in Gun Safety* guidelines in the Shooting Sports Guidebook or Shooting Sports Supplement.
  - \_\_\_\_\_b. List the Six Rules for Safe Airsoft Gun Handling and describe similarities to and differences from the three rules of the *Gold Standard in Gun Safety* guidelines.
  - \_\_\_\_\_c. Describe or identify the parts of an Airsoft Gun including: Gear Box, Battery or Gas cartridge, Hop-Up, Motor for an AEG Gun, Piston and Air Chamber, and Stock.
  - \_\_\_\_\_d. Explain how Airsoft Guns differ from actual firearms and list at least three examples.
  - \_\_\_\_\_e. Describe how to properly transport an Airsoft Gun.
  - \_\_\_\_\_f. Explain and demonstrate the proper safety gear for Airsoft game play and describe the following face protection options:
    - \_\_\_\_\_i. ANSI Z87.1 Goggles or face mask and anti-fogging methods
    - \_\_\_\_\_ii. Mesh face mask (Non-Eye protection)
    - \_\_\_\_\_iii. Helmets
    - \_\_\_\_\_iv. Balaclavas
  - \_\_\_\_\_g. Explain and demonstrate proper Trigger control.
  - \_\_\_\_\_h. Demonstrate how to safely Load, Unload, and CLEAR the following Airsoft Gun types:
    - \_\_\_\_\_i. Airsoft Electric Gun (AEG) rifle
    - \_\_\_\_\_ii. Gas Power/High Pressure Air-tank (HPA) rifle or pistol
    - \_\_\_\_\_iii. Manual Action Spring rifle or pistol
  - \_\_\_\_\_i. Describe proper handling and use of the following:
    - \_\_\_\_\_i. Batteries
    - \_\_\_\_\_ii. Gas (Green Gas)
    - \_\_\_\_\_iii. High Pressure Air Tanks
  - \_\_\_\_\_j. Explain and demonstrate how to clear a jammed BB
- \_\_\_\_\_4. Do the following to prepare to Be Responsible, Respect Your Community, Obey the Law:
- \_\_\_\_\_a. Read the laws in your state for the purchase of Airsoft guns and regulations for their use in your community. Then do the following:

- \_\_\_\_\_i. List at least three criteria required for Airsoft gun purchases (example, be 18 years old), list the code citation for your state if applicable.
- \_\_\_\_\_ii. List at least two laws governing Airsoft play in the Community. (Example, orange tips must be visible at all times)
- \_\_\_\_\_b. Describe how you should respond if approached by a law enforcement officer during Airsoft play.
- \_\_\_\_\_c. Describe how you should respond if a neighbor asks you to stop playing in your neighborhood.
- \_\_\_\_\_5. For each of the following game scenarios, participate in a game scenario and rules orientation and then play the game scenario:
  - \_\_\_\_\_a. Capture the Flag
  - \_\_\_\_\_b. Escort Mission
  - \_\_\_\_\_c. Death Match
  - \_\_\_\_\_d. Deliver the Package
  - \_\_\_\_\_e. Medical Mission

**Do Three of the following optional requirements (6-12)**

- \_\_\_\_\_6. Describe Blind Fire; when it should and should not be used; and why it is not permitted at some commercial Airsoft fields.
- \_\_\_\_\_7. Describe the following Batteries and what the advantages and disadvantages:
  - \_\_\_\_\_a. Nickel Metal Hydride (NiMH)
  - \_\_\_\_\_b. Lithium-ion Polymer (LiPo)
- \_\_\_\_\_8. Explain the differences between and the uses and benefits for the following:
  - \_\_\_\_\_a. Airsoft Electric Gun (AEG) rifle
  - \_\_\_\_\_b. Gas Power/High Pressure Air-tank (HPA) rifle or pistol
  - \_\_\_\_\_c. Manual Action Spring Guns rifle or pistol
- \_\_\_\_\_9. Explain the difference between a tight bore barrel and a standard barrel. Describe how both of these impact performance.

- \_\_\_\_10. Explain what an Airsoft's caliber is and show how to ensure you have the correct caliber BB for a tight bore barrel and a standard barrel
- \_\_\_\_11. Describe and Demonstrate how to safely clean and maintain an Airsoft Gun
- \_\_\_\_12. Design your own game, including the following:
- \_\_\_\_a. Format: indoor or outdoor
  - \_\_\_\_b. Type of game or scenario
  - \_\_\_\_c. Field layout design including designated safe zones
  - \_\_\_\_d. Game rules (All safety guides must be considered) including: game duration, respawn rules (if any respawns), and how to win.

For Recommended Resources: See the Shooting Sports Supplement

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Date

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# Apologetics I

Name \_\_\_\_\_

While the word apologetics is related to the word apology, apologetics does not mean being sorry or apologizing for what you believe. Rather apologetics is a defense of the Christian Faith; answering the objections or questions of an unbeliever. The Apologetics I Trail Badge focuses on the existence of God, truth, and the problem of evil.

## Do all of the following requirements (1-5)

- \_\_\_\_\_1. Study apologetics in the Bible by doing the following:
  - \_\_\_\_\_a. Read 1 Peter 3:15-16 which contains the Greek root word for apologetics, apologia; which is translated in versions of the Bible as answer, defense, or reason.
  - \_\_\_\_\_b. Read Acts 17:16-31 which contains one of the clearest recorded uses of apologetics in Christianity.
  - \_\_\_\_\_c. Read 2 Corinthians 10:4-5; 1 Thessalonians 5:21; and Jude 3. Explain how these versions related to apologetics.
  - \_\_\_\_\_d. Participate in a discussion of using reason in contending or defending our faith.
- \_\_\_\_\_2. Research and explain the difference between Evidential Apologetics, (articulated by men such as Hugo Grotius, John Locke, John Warwick Montgomery, Gary Habermas) and Presuppositional Apologetics (articulated by men such as Cornelius Van Til, Gordon Clarke, Edward Carnell, and Scott Oliphint. Compare and contrast these two general approaches; discuss the strengths and weaknesses of each and tell which appeals to you the most, the least, and why.
- \_\_\_\_\_3. Research and explain the two-step approach to the Classical Approach to Apologetics (articulated by such men as St. Augustine, Thomas Aquinas, John Gerstner, R.C. Sproul, C.S. Lewis, Norm Geisler, and William Lane Craig) and tell how this approach uses some of the Classical and some of the Presuppositional approaches.
- \_\_\_\_\_4. Research and explain why the logical principle or the **“law of non-contradiction”** is so important to apologetics or any clear thinking.
- \_\_\_\_\_5. Present a defense of your faith using one or more of the above three approaches based on what you learned from completing all other requirements for this badge.



Do one (1) requirement in each of the three different topics below (6-19)

### Existence of God

Atheists deny the existence of any god, let alone the Triune God of scripture. How can Christians present a case for God?

- \_\_\_\_\_6. Find and read the article "Twenty Arguments for the Existence of God" by Peter Kreeft. Present your favorite three arguments (see Apologetics Resources).
- \_\_\_\_\_7. Summarize the "Five Ways" of Thomas Aquinas.
- \_\_\_\_\_8. Research and explain how the Latin phrase "ex nihilo nihil fit" is both a proof for God's existence and God as creator of the universe.
- \_\_\_\_\_9. Create a skit or presentation about the "Argument from Desire."
- \_\_\_\_\_10. Summarize St. Bonaventure's demonstration from Love in "The Soul's Journey into God."
- \_\_\_\_\_11. Summarize and discuss Jonathan Edward's argument from experience in his sermon titled "That Divine and Supernatural Light."

### Truth

When we defend the Christian Faith, we are making claims about what is true. Many nonbelievers claim not to believe in truth. What is truth?

- \_\_\_\_\_12. Do a Bible study on truth.
  - \_\_\_\_\_a. Read Proverbs 12:19; Ephesians 6:14; 1 Corinthians 5:8; 1 Peter 1:22; 3 John 4. Tell what we are to do with truth.
  - \_\_\_\_\_b. Read John 18:37-38. Psalm 119:160; John 14:6; Ephesians 4:21. Tell what Jesus has to do with the truth.
  - \_\_\_\_\_c. Read Ephesians 4:15; 1 Corinthians 13:1-2. Tell if being right and truthful is all that matters.
- \_\_\_\_\_13. Create a presentation explaining:
  - \_\_\_\_\_a. A propositional statement,
  - \_\_\_\_\_b. The principle of identity, and
  - \_\_\_\_\_c. The principle of the excluded middle.
- \_\_\_\_\_14. Define objective truth and the competing views of relativism, pragmatism, materialism and skepticism.

### Problem of Evil

The existence of evil and suffering is a stumbling block for many.

- \_\_\_\_\_15. Define omnipotent, omniscient, omnibenevolent, and theodicy.

- \_\_\_\_\_16. Do a Bible study involving the following:
- \_\_\_\_\_a. Read Matthew 19:26; Psalm 139:7-10; Psalm 136:1; Isaiah 5:20; and Psalm 5:4
  - \_\_\_\_\_b. Define sin and how we are affected by sin.
  - \_\_\_\_\_c. Read Genesis 50:20; Romans 8:28; James 1:13-15
  - \_\_\_\_\_d. **Discuss God's character and the consequences of living in a fallen world.**
- \_\_\_\_\_17. Read an overview of the book of Job. Then read Job 42:1-6. **Discuss Job's answer to the problem of evil.**<sup>1</sup>
- \_\_\_\_\_18. Define:
- \_\_\_\_\_a. Irenaean theodicy
  - \_\_\_\_\_b. Augustinian theodicy
  - \_\_\_\_\_c. Free Will Defense
  - \_\_\_\_\_d. Create a presentation of your favorite answer to the problem of evil.
- \_\_\_\_\_19. **Read C. S. Lewis' "The Problem of Pain" and create a presentation or skit explaining Lewis' arguments from this book.**

## Apologetics Activities

Do two (2) of the six (6) following optional requirements (20-25):

- \_\_\_\_\_20. Attend a debate between a Christian and a non-Christian or watch a recorded debate. Note the arguments used.
- \_\_\_\_\_21. Interview a missionary, pastor, church teacher, or church volunteer. Ask about apologetics in the life of the church and in ministry. Discuss the relation of apologetics to evangelism and to Christian education.
- \_\_\_\_\_22. Watch an apologetics movie and discuss the arguments (see Activity Resources for some suggestions).
- \_\_\_\_\_23. Research an apologetics ministry and present your findings to your mentor or Patrol (see Activity Resources for some suggestions).
- \_\_\_\_\_24. Research an apologist agreed upon with your mentor (see Activity Resources for some suggestions). Present an oral or written biography.
- \_\_\_\_\_25. Read an apologetics book agreed upon by your mentor and parents. Present an oral report or write a short essay discussing the key points.

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<sup>1</sup> For further consideration and study, consider St. John Paul II apostolic letter *On the Christian Understanding of Human Suffering*.



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## Apologetics Resources

*If your specific faith tradition relies on a Catechism or similar published teaching instrument that is viewed within your tradition as authoritative inasmuch as it clarifies, reinforces, and supplements the lessons of Holy Scripture, consult that published resource. Discuss these teachings with a Trail Badge Mentor who shares your faith tradition.*

### Existence of God Resources:

As of April 2018, "Twenty Arguments for God's Existence" can be found on Dr. Peter Kreeft's website at [http://www.peterkreeft.com/topics-more/20\\_arguments-gods-existence.htm](http://www.peterkreeft.com/topics-more/20_arguments-gods-existence.htm)

### Historicity of Jesus Resources:

As of April 2018, the presentation "Why Jesus?—The Historical Jesus" can be found at [http://www.apologetics315.com/2013/07/free-essential-apologetics-powerpoint\\_29.html](http://www.apologetics315.com/2013/07/free-essential-apologetics-powerpoint_29.html)

### Activity Resources:

Some possible apologetics movies include: *The Case for Christ* or one of the *God's not Dead* movies.

Some possible apologetics ministries include:

Ravi Zacharias Ministries - <http://rzim.org>

Reasonable Faith (William Lane Craig) - <http://www.reasonablefaith.org>

Josh McDowell Ministry - <http://www.josh.org>

Stand to Reason (Greg Koukel, et. al.) - <https://www.str.org>

Some possible apologists include: Justin Martyr, Thomas Aquinas, Blaise Pascal, C. S. Lewis, or Francis Schaeffer.



Some possible apologetics books include:

*Mere Christianity* by C. S. Lewis

*More than a Carpenter* by Josh McDowell

*The Reason for God* by Tim Keller

*The God Who is There* by Francis Schaeffer

*Orthodoxy* by G. K. Chesterton

### General Resources:

There are many handbooks and reference books on apologetics. A few popular ones are:

*Handbook of Christian Apologetics* by Kreeft & Tacelli

*Holman QuickSource Guide to Christian Apologetics* by Doug Powell

*Baker Encyclopedia of Christian Apologetics* by Norman Geisler

[www.Formed.org](http://www.Formed.org), [www.Catholic.com](http://www.Catholic.com), and the *Catechism of the Catholic Church*

*New Dictionary of Christian Apologetics* by Evans, Campbell-Jack, McGrath

*Christian Apologetics: A Comprehensive Case for Biblical Faith* by Douglas Groothuis

*This Elective Badge has been reviewed and approved by the National Catholic Committee for Trail Life USA.*





## Apologetics II

Name \_\_\_\_\_

While the word apologetics is related to the word apology, apologetics does not mean being sorry or apologizing for what you believe. Rather apologetics is a defense of the Christian Faith; answering the objections or questions of an unbeliever. The Apologetics II Trail Badge focuses on the accuracy of the Bible and the historicity, divinity and resurrection of Jesus. It also requires some active use or application of apologetics with another person/s.

### Do all of the following requirements (1-3)

- \_\_\_\_\_1. Determine what the Bible claims about itself by researching these scriptures: 2 Timothy 3:16; 2 Peter 1:21; Exodus 34:27; 2 Peter 3:15-16; John 5:39-40.
- \_\_\_\_\_2. Explain why attitude, listening, self-control, wisdom, humility, and most especially love are important characteristics to develop and use when engaging a non-Christian or a skeptic in an apologetic communication.
- \_\_\_\_\_3. Present a defense of your faith based on what you learned from completing all other requirements for this badge.

### Do one (1) requirement in each of the four (4) different topics below (4-18)

#### Bible

Trail Life USA believes “the Holy Scriptures (Old and New Testaments) to be the inspired and authoritative Word of God.” This statement is often under attack.

- \_\_\_\_\_4. Research how many copies of ancient manuscripts of the New Testament and Old Testament exist compared to how many ancient manuscripts of Homer, Plato, and Aristotle exist.
- \_\_\_\_\_5. Tell the story of the finding of the Dead Sea Scrolls to a younger Patrol or your Patrol including how many Old Testament books were found and their condition.
- \_\_\_\_\_6. Copy a chapter of the Bible by hand, doing so prayerfully and thinking about the words. Have a parent review and find your mistakes. Research how the scribes of the past prevented such errors.
- \_\_\_\_\_7. Tell why it is reasonable to assume the Old Testament was written early. Research the Code of Hammurabi.



## Historicity of Jesus

Christianity claims that Jesus is a real person who lived in a specific place at a specific time.

- \_\_\_\_8. Do the following:
  - \_\_\_\_a. Look up and read the following passages: Luke 2:1-7; Matthew 2:1, 22; Luke 3:1-2; John 19:15-16; Matthew 26:3-5; Matthew 27:1-2.
  - \_\_\_\_b. Discuss why understanding the historical setting when Jesus lived was important to reading and understanding to the New Testament writers.
  - \_\_\_\_c. Discuss what you learned about the time and culture that Jesus lived in and how that is different from today.
- \_\_\_\_9. Other ancient texts make reference to Jesus and his followers. Among these are Josephus, Tacitus, and Pliny the Younger. Find three ancient references to Jesus or Christians. Write a one-page essay or create a presentation quoting these sources.
- \_\_\_\_10. Read the presentation, "Why Jesus?—The Historical Jesus." (see Apologetics Resources) Tell what you found most convincing.

## Divinity of Jesus

Christianity traditionally teaches that Jesus was more than just a man; they believe that Jesus is both fully God and fully man.

- \_\_\_\_11. Do a Bible Study.
  - \_\_\_\_a. Read Titus 2:13; 2 Peter 1:1; Philippians 2:5-8; John 10:30; John 1:1, 14; John 20:28; Matthew 14:33.
  - \_\_\_\_b. List all those who took Jesus to be divine.
- \_\_\_\_12. Create a presentation for the Liar, Lunatic, or Lord argument.
- \_\_\_\_13. Create a skit discussing the divinity of Jesus.

## Resurrection

The resurrection of Jesus is a key belief and doctrine of the Christian faith.

- \_\_\_\_14. Research passages for the resurrection: Matthew 27:62-66; Matthew 28:1-7; Mark 16:1-7; Luke 24:1-7; John 20:1-9; 1 Corinthians 15:17. Tell what you learned regarding the resurrection.
- \_\_\_\_15. Research what is known about how each of the following of Jesus disciples died: Andrew, Bartholomew, James Alphaeus, James Zebedee, Jude, Mathew, Peter, Simon, and Thomas. Discuss if they would have died in these manners if Jesus was not resurrected.





- \_\_\_\_\_16. Research how many eyewitnesses the New Testament says saw the resurrected Christ. List the passages.
- \_\_\_\_\_17. Read Deut. 19:15. Are eyewitnesses considered “direct evidence” at court? Create a court room skit with witnesses.
- \_\_\_\_\_18. Doubters propose various alternatives to resurrection. Among these are the swoon, hallucination, and theft theories. Research what they are and form an apologetic response to these arguments.

### Direct Apologetic Engagement:

Perform any one (1) of the below (19-25) direct uses of apologetics and write a one-page paper regarding your experiences.

- \_\_\_\_\_19. Engage in a formal debate or informal debate with a non-Christian.
- \_\_\_\_\_20. Spend one hour on a high school or college campus doing evangelistic surveys and dialogue with the students.
- \_\_\_\_\_21. Describe any conversation you have had in the past with an unbelieving friend, neighbor or family member and recount how the conversation went. What occurred, what arguments were exchanged and what would you have done differently if you had to do it over again.
- \_\_\_\_\_22. **Share the Four Spiritual Laws, Evangelism Explosion’s Two Question Test or some other evangelistic tool that shares the Gospel with another person.**
- \_\_\_\_\_23. Stage a mock debate with another Christian who pretends to make the arguments of an atheist or skeptic before some group of people.
- \_\_\_\_\_24. Research and discuss with a Trail Badge Mentor who shares your faith tradition three areas of Theological disagreement among Christian faith traditions. Discuss the opposing viewpoints, how the differences arose, and what can be done to promote unity among the Church.
- \_\_\_\_\_25. Under the supervision of your parent or adult guardian and Trail Badge Mentor, research an apologetics question of interest to you from a credible source. Discuss why you researched that particular question and what you learned.



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Some possible apologists include: Justin Martyr, Thomas Aquinas, Blaise Pascal, C. S. Lewis, or Francis Schaeffer.



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**TRAIL  
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USA**

# Archery

Name \_\_\_\_\_

All archery activities must be done under the safety requirements of the Trail Life USA Health and Safety Guide. In particular, all archery shooting, whether for score or for practice, must be done on a properly controlled and supervised archery range.

Do all of the following requirements (1-4)

- \_\_\_\_1. Participate in an archery safety orientation and do the following:
  - \_\_\_\_a. List the safety rules of the archery range.
  - \_\_\_\_b. Demonstrate the proper use of an arm guard, finger tab, and quiver.
  - \_\_\_\_c. Describe or demonstrate the range voice and whistle commands.
  - \_\_\_\_d. Summarize the state and local laws in your area that address the use and regulation of archery equipment.
- \_\_\_\_2. Describe proper care of archery equipment including maintenance, storage, and transportation of arrows and a compound bow, recursive bow, or longbow. Do the following:
  - \_\_\_\_a. List tools an archer needs.
  - \_\_\_\_b. Identify the parts of an arrow.
  - \_\_\_\_c. Identify the parts of a compound bow, recursive bow, or longbow.
  - \_\_\_\_d. Properly string a bow.
- \_\_\_\_3. Under the supervision of an experienced archer, participate in an archery skill orientation and do the following:
  - \_\_\_\_a. Demonstrate the nine steps of a good shooting method.
  - \_\_\_\_b. Shoot at least 60 arrows at a target.
  - \_\_\_\_c. Correctly score one round of arrows using a score sheet.



- \_\_\_\_\_d. Demonstrate the proper way to pull your arrows out of the target.
- \_\_\_\_\_e. Demonstrate safely carrying arrows.
- \_\_\_\_\_4. Practice archery and then complete one of the following qualifying options. The option and requirements will depend on your archery range and bow types. Your rangemaster will provide the qualification criteria based on whether it is an indoor or outdoor scoring matrix; the bow type (barebow/basic compound, Olympic recurve, or compound bow); and the program.
  - \_\_\_\_\_a. Meet or exceed the qualifying score for the Green JOAD Pin-One Star or higher.
  - \_\_\_\_\_b. Meet or exceed the qualifying score for the WA (FITA) White Arrow Award or higher,

**Do three optional requirement from any topic below (5-15)**

#### **Bowyer**

- \_\_\_\_\_5. Make a bow.
- \_\_\_\_\_6. Make a bowstring.
- \_\_\_\_\_7. Make an arrow.

#### **Knowledge**

- \_\_\_\_\_8. Teach someone new to archery the following:
  - \_\_\_\_\_a. Safety rules of the archery range
  - \_\_\_\_\_b. Proper use of an arm guard, finger tab, and quiver
  - \_\_\_\_\_c. Archery range voice and whistle commands
  - \_\_\_\_\_d. How to correctly hold a bow and arrow
- \_\_\_\_\_9. With permission of your parents, go to the web sites of WA, USAA, and NFAA to familiarize yourself with the different programs they offer and sponsor (see resources at the bottom). Explain to your Mentor one of the following:
  - \_\_\_\_\_a. WA Beginners Arrow Awards Program
  - \_\_\_\_\_b. 1440 Round, formerly called a FITA Round, for indoors, outdoors, or the Olympics
  - \_\_\_\_\_c. JOAD Award Program and the closest JOAD club

- \_\_\_\_\_d. Any upcoming international, US, or field archery competitions or tournaments
- \_\_\_\_\_10. Attend and report on an archery tournament sponsored by WA, USAA, or NFAA.
- \_\_\_\_\_11. The following are terms commonly used in the sport of archery. Define each one:  
Anchor Point, Broad Head, Cat Whisker, Compound Bow, Crossbow, Draw, Draw Weight, End, Field Point, Fletching or Vane, Limb, Nock, Recurve Bow, Release, Rest, Round, Shooting Line, Sight, Sight Pin, Stabilizer, String Wax

### **Experience**

- \_\_\_\_\_12. Practice archery after completing requirement 4 and then complete one of the following qualifying options based on the same constraints in requirement 4.
  - \_\_\_\_\_a. Meet or exceed the qualifying score for the Purple JOAD Pin-Two Stars or higher.
  - \_\_\_\_\_b. Meet or exceed the qualifying score for the WA (FITA) Black Arrow Award or higher,
- \_\_\_\_\_13. Set up at least three field targets and shoot at least fifteen arrows at each target.
- \_\_\_\_\_14. Participate in an archery tournament with standard targets.
- \_\_\_\_\_15. Participate in an archery shooting arcade contest with fun targets.

## Resources

World Archery (WA), formerly FITA, oversees the Olympics and other international archery competitions: <http://www.worldarchery.org/>

USA Archery (USAA), formerly, NAA, oversees the US Olympic archery team and the Junior Olympic Archery Development (JOAD) program for youth: <http://www.usarchery.org/>

National Field Archery Association (NFAA) is a national allied organization of USAA with a focus on field archery: <https://www.nfaausa.com/>

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# Art History

*God is the ultimate artist. His color combinations, forms and texture are without comparison. He created many of us with a love and talent for creating art. Even without a pronounced talent, we can enjoy art. We can glean knowledge of cultures through their art. Take a peek back in time to see what history has to say about art through the ages. For convenience you may capture your work and answers in an electronic or paper-based notebook or portfolio.*

Name \_\_\_\_\_

## Do all of the following requirements (1-9)

1. God is the greatest artist. Think of one example of God's art and describe the example.
2. Just like books, artwork has a certain way of being referred to beyond its title. Find three famous paintings that you like from three different centuries. List each painting's description using the commonly used format given below:
  - The artist's name,
  - The name of the artwork,
  - The medium used,
  - The size of the artwork,
  - The date the artwork was created and the place where it was created,
  - The collection it is part of currently or museum where it is now displayed.
3. Art is described by special terms. It is helpful to learn these terms. Define the following basic principles and elements of art: line, shape, space, value, texture, color, repetition, balance, contrast, emphasis, and unity.
4. The earliest known paintings are found in caves. Learn about the famous cave paintings found in Lascaux, France and answer the following questions:
  - a. How were these paintings found?
  - b. What do these paintings show?
  - c. What did they use for paints?
5. Study the art of the ancient Egyptians, Greeks, or Romans. Answer the following questions.

- a. How was their artwork tied in with religion?
  - b. What do you like or dislike about the artwork from this period?
  - c. Who was a famous artist from this period?
6. Study the art of the Middle Ages (AD300-AD1400) and answer the following questions:
- a. What was the greatest influence on art in these times?
  - b. What are icons, triptychs, and frescos?
  - c. Who was Giotto?
  - d. What importance did sculpture have during this period?
  - e. How was art incorporated into churches built during this time period?
7. Study the art of the Renaissance (AD1400-AD1600) and answer the following questions:
- a. Who were the great painters of this time period?
  - b. What countries did they represent?
  - c. Who was Giorgio Vasari and why was he important?
8. Study the art from AD1600 to AD1900, the Baroque, Rococo, Neoclassical, Romantic, Realism, Impressionist and Post-impressionist styles. The Dutch and English also had their own styles and growth in paintings during this time. Do one of the following and include characteristics of the style as well as examples:
- a. Do a comprehensive study and presentation of one of these styles.
  - b. Do a study and presentation outlining five of these styles.
9. Study the works of art in the 20th and 21st centuries. Find examples of Cubism, Expressionism, Regionalism, Op art, Surrealism, and Pop art. Answer the following questions:
- a. What is your favorite painting?
  - b. Describe any strong feelings you have about any of these styles?

Do three of the following optional requirements (10-22)

10. Watch four hours of programming on art history or art appreciation. These can be found in the local library or on many art museum websites.

11. Explore careers in the field of Art History. Choose one that interest you most and investigate the day-to-day tasks of that career, as well as any education required. List your findings.
12. Visit a place where art is displayed, such as an art gallery, an art museum, an art fair, **or an artist's studio. Choose a favorite piece of art and write a paragraph about it or** discuss it with your Mentor using the principles and elements in Requirement 3.
13. In the 1800s, the Impressionist movement began. Make a poster, showing the works and life of one of these painters: Manet, Monet, Degas, Renoir, Pissaro or Sisley.
14. Make a replica of a cave painting on brown or gray paper. Use paints made from the same kinds of plants and minerals the early artists used or use crayon, pastels, or modern paints.
15. **With your parents' permission, visit websites of modern-day artists.** Choose two artists.
  - a. Categorize the kind of art each artist produces. One artist might produce more than one kind of art. List as many as you feel best describes the artist.
  - b. If available, report the price of their art.
  - c. Tell where they show their art in galleries, art shows, or some other way.
  - d. Tell whether the artists give workshops.
  - e. Create a brochure advertising this information.
16. Choose a country. Find artwork, ancient, historic or modern, from this country. Make a small notebook or poster of what you find including the name of the artists and the dates of the works.
17. Make a sculpture that is inspired by a famous sculpture. You may use any sculpture medium such as soap, salt dough, paper-Mache, air-dry clay, oven-dried clay, soapstone, wood, metal, or something else.
18. Visit a building designed by a famous architect.
  - a. Take pictures and make a display.
  - b. Tell the biography of this architect and any other notable buildings that he or she designed.
19. Take photos or gather pictures showing different styles of buildings.

- a. Explain the characteristics of each type of building.
  - b. Make a poster.
20. After completing the requirements 4 through 8, choose one of the requirements to present to the younger members of your Troop. Be sure to have your presentation approved by both Unit Leaders prior to presenting.
21. Organize and set up a small art museum. Display posters that Trailmen have made or prints that have been found. Arrange these according to time periods, styles, and countries. Invite others to view your museum and take them on tours, giving interesting explanations of the artwork and their artists.
22. With a group of Trailmen working on this badge, display the notebooks, posters, and artwork produced for the badge in the manner of a museum.

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# Aviation

Name \_\_\_\_\_

Do the following two requirements (1-2):

\_\_\_\_1. Draw a diagram showing the four forces of flight and explain the following terms:

\_\_\_\_a. Stall speed

\_\_\_\_b. Mach number

\_\_\_\_c. Aircraft angles or axes of rotation: Pitch, Yaw and Roll

\_\_\_\_2. Explain Universal Time Coordinated (UTC), also called Zulu Time, and its uses in aviation.

Do one of the following requirements for an Aircraft Category (3-6).

\_\_\_\_3. Airplane - Using a diagram, picture, model, or airplane:

\_\_\_\_a. Identify and explain the following aircraft parts:

\_\_\_\_i. Main structural components: engine nacelle, engine cowling, fuselage, empennage, wings, vertical stabilizer, horizontal stabilizer, wind screen

\_\_\_\_ii. Controls: control yoke or control column, rudder pedals, throttle, flaps, slats, ailerons, elevator, trim tab, rudder

\_\_\_\_iii. Braking devices: ground spoilers, wheel brakes, thrust-reversers

\_\_\_\_b. Explain what V, H and T tail design configurations mean.

\_\_\_\_c. Explain what winglets are used for and why aircraft companies are now adding them to aircraft.

\_\_\_\_d. Describe what effect winglets have on any of the four forces of flight.

\_\_\_\_4. Glider - Using a diagram, picture, model, or glider:

\_\_\_\_a. Identify and explain the following modern sailplane parts:

- \_\_\_\_\_i. Main structural components: fuselage, wings, empennage, horizontal stabilizer, vertical stabilizer, canopy
- \_\_\_\_\_ii. Controls: control column or stick, rudder pedals, airbrakes, ailerons, flaps, elevator, rudder
- \_\_\_\_\_iii. Landing gear: retractable main wheel, tail wheel, skids
- \_\_\_\_\_b. Define aspect ratio, lift-to-drag ratio, and glide ratio. Explain how they are related.
- \_\_\_\_\_c. Explain the benefits of glider training for aircraft pilots.
- \_\_\_\_\_d. Research and report the glide ratios for the following:
  - \_\_\_\_\_i. Modern sailplane
  - \_\_\_\_\_ii. Hang glider
  - \_\_\_\_\_iii. Paraglider
  - \_\_\_\_\_iv. Boeing 767 (e.g. Gimli Glider)
  - \_\_\_\_\_v. Space Shuttle on approach
- \_\_\_\_\_5. Rotorcraft - Using a diagram, picture, model, or rotorcraft:
  - \_\_\_\_\_a. Identify and explain the following helicopter parts:
    - \_\_\_\_\_i. Main structures: fuselage, cowling, tail boom, cockpit, landing skid
    - \_\_\_\_\_ii. Rotor system: main rotor, tail rotor, swash plate, engine, mast,
    - \_\_\_\_\_iii. Flight controls: cyclic, collective, throttle, anti-torque pedals
  - \_\_\_\_\_b. Describe Autorotation and explain when it is used.
  - \_\_\_\_\_c. List the three main flight controls of a helicopter and what movements they control.
  - \_\_\_\_\_d. Explain the purpose of a tail rotor and what rotorcraft movement it is controlling.
  - \_\_\_\_\_e. Learn why a CH-47 helicopter has counter rotating blades and why it doesn't need a tail rotor.
- \_\_\_\_\_6. Lighter than Air - Using a diagram, picture, model, or hot air balloon:

- \_\_\_\_\_a. Identify and explain the following hot air balloon parts and:
1. Main structures: Gondola, burners, load tapes, scoop/skirt, mouth/throat
- \_\_\_\_\_ii. Control: turning vents, deflation port, ballast
- \_\_\_\_\_b. Explain how hot air balloons become airborne.
- \_\_\_\_\_c. Describe how the Montgolfier brothers contributed to balloon flight.
- \_\_\_\_\_d. Describe the difference between a balloon and an airship.

**Do two of the following Air Traffic Control requirements (7-12)**

- \_\_\_\_\_7. Tour an Air Traffic Control Tower and explain their purpose.
- \_\_\_\_\_8. Listen to some live or recorded air traffic control dialog. Describe the type of information exchanged on the ground and in flight.
- \_\_\_\_\_9. Explain the use of the following aircraft devices; cockpit voice recorder (CVR), emergency locator transmitter (ELT), and flight data recorder (FDR).
- \_\_\_\_\_10. Explain what an aircraft N-number is and describe how to register one.
- \_\_\_\_\_11. Look over an aeronautical chart for your area and do the following:
- \_\_\_\_\_a. Identify the various types of airfields/airports, controlled airspace, obstructions, and geographical features.
  - \_\_\_\_\_b. Explain the term military operations area (MOA).
  - \_\_\_\_\_c. Locate the lines of latitude and longitude.
- \_\_\_\_\_12. Describe or demonstrate how to file a flight plan.

**Do five optional requirements in at least two different topics (13-41)**

**Airplanes**

- \_\_\_\_\_13. Explain how both the propeller and jet engines provide thrust for an aircraft. Explain the differences in the operation of piston, turbojet, turboprop, and turbofan engines.
- \_\_\_\_\_14. Research and explain the importance of proper aircraft weight and balance and explain the following:
- \_\_\_\_\_a. What can happen when the center of gravity (CG) is too far forward or aft.
  - \_\_\_\_\_b. Maximum takeoff weight (MTOW)
  - \_\_\_\_\_c. The consequences of exceeding MTOW

- \_\_\_\_\_d. How ballast is used in aircraft
- \_\_\_\_\_15. Research the specifications for the aircraft listed below. List the length, wingspan, gross weight, max ceiling, max range, max speed, and dates of production of each. Using lines to represent the lengths and wingspans, layout on paper a scaled representation of each.
- \_\_\_\_\_a. Boeing 747-400
- \_\_\_\_\_b. Lockheed P-38
- \_\_\_\_\_c. Douglas DC-3
- \_\_\_\_\_d. Cessna 208
- \_\_\_\_\_e. Wright Flyer
- \_\_\_\_\_16. List the types of landing gear available for each aircraft listed below. Identify which one can land on water with the proper landing gear installed.
- \_\_\_\_\_a. Boeing 747-400
- \_\_\_\_\_b. Lockheed P-38
- \_\_\_\_\_c. Douglas DC-3
- \_\_\_\_\_d. Cessna 208
- \_\_\_\_\_e. Wright Flyer

### Aviation Careers

- \_\_\_\_\_17. Research pilot training and describe the following:
- \_\_\_\_\_a. Requirements to become a pilot
- \_\_\_\_\_b. Changes in pilot training due to the introduction of modern flight simulators and flight training software
- \_\_\_\_\_c. What it means for a pilot to be instrument rated
- \_\_\_\_\_18. Describe five career options in aviation.
- \_\_\_\_\_19. Interview someone involved in a profession related to aviation (pilot, flight instructor, air traffic controller, flight attendant, aircraft technician, an engineer in the aerospace industry, etc.) Find out the age when they became interested in aviation. List what education and skills are required for their profession.
- \_\_\_\_\_20. Talk with the operator of a flight school or with a flight instructor about the steps to **earning a pilot's license and the different types of aircraft that fly in and out of their facility.**



## Aviation Fun

- \_\_\_\_\_21. Fly in a commercial or general aviation airplane. Record the date, place, type of airplane and duration of your flight.
- \_\_\_\_\_22. Fly in a glider. Record the date, place, type of airplane and duration of your flight.
- \_\_\_\_\_23. Fly in a rotorcraft. Record the date, place, type of rotorcraft and duration of your flight.
- \_\_\_\_\_24. Fly in a balloon or airship. Record the date, place, balloon or airship type and duration of your flight.
- \_\_\_\_\_25. Plan a commercial air trip of at least 3,000 miles starting from the commercial airport nearest your home. Plan adequate time for layovers and changing planes en route.
  - \_\_\_\_\_a. Draw the approximate flight route of this trip on a map.
  - \_\_\_\_\_b. Using airline timetables, look up and record all arrivals and departures at the start, all connection points, and the final destination for this trip.

## History

- \_\_\_\_\_26. Visit an aviation museum. Record at least five different types of aircraft you see and the unique abilities of each.
- \_\_\_\_\_27. Visit an aviation landmark, such as Kitty Hawk, and record the significance of what happened there, including the date, activities and people involved.
- \_\_\_\_\_28. Read a book on some aspect of aviation history and explain what you learned.
- \_\_\_\_\_29. Read a book about Wilbur and Orville Wright and their experiments to make the first airplane. Explain some key factors that led them to success.
- \_\_\_\_\_30. Create and present a video or presentation to your troop, unit, or other group about the first successful airplane flight including the history, technical challenges, and impact to life.
- \_\_\_\_\_31. Research the Gimli Glider incident. Explain what happened including the aircraft model involved, the unique experiences of the aircrew that aided them, the estimated glide ratio of the aircraft, and the findings, punishments and awards that resulted from the incident.

## Learning to Fly

- \_\_\_\_\_32. Take an introductory flying lesson with a certificated flight instructor.
- \_\_\_\_\_33. Pilot a simulated flight in a flight simulator or training device.

- \_\_\_\_\_34. Read the FAA guide: Conducting an Effective Flight Review (see References below) and conduct an XC Flight Plan Review as described on pp. 4-5 of the FAA guide using the checklist provided in Appendix 4 on p. 20.
- \_\_\_\_\_35. Explain the following pilot safety methods:
- \_\_\_\_\_a. PAVE checklist
  - \_\_\_\_\_b. IMSAFE checklist
  - \_\_\_\_\_c. DECIDE Analytical Decision-Making
- \_\_\_\_\_36. Under supervision, perform a preflight inspection of a typical general aviation airplane, including:
- \_\_\_\_\_a. Check the oil
  - \_\_\_\_\_b. Check the lights
  - \_\_\_\_\_c. Check fuel quantity
  - \_\_\_\_\_d. Check for water in the gasoline
  - \_\_\_\_\_e. Clean the windscreen
- \_\_\_\_\_37. Tour a cockpit or using a poster or diagram of a cockpit, identify and explain the functions of the six primary flight instruments: airspeed indicator, artificial horizon, altimeter, turn coordinator, heading indicator, and vertical speed indicator.

### **Mentoring**

- \_\_\_\_\_38. Organize and lead a paper airplane-flying contest for a younger unit. Assist the Trailmen in making their paper airplanes. Possible contests include: longest flight, longest hang time, straightest flight, greatest stunt, and aircraft carrier landing (inside a rectangle marked with tape on the floor).
- \_\_\_\_\_39. Teach aviation basics to a younger unit or patrol including:
- \_\_\_\_\_a. The four forces of flight
  - \_\_\_\_\_b. The Wright brothers, the Wright Flyer, and the first successful flight
  - \_\_\_\_\_c. Where the Wright Flyer is today
- \_\_\_\_\_40. Organize and lead a paper airplane design and test session for a younger unit. Assist the Trailmen in making and testing a variety of basic and inventive paper airplane configurations such as ring wing, helicopters and basic gliders for aerobatic loops or turns.

- \_\_\_\_\_41. Explain basic aircraft structures to a younger unit. Guide them through drawing their own airplane design. Help them label the following:
- \_\_\_\_\_a. Fuselage, wings, wind screen, and landing gear
  - \_\_\_\_\_b. Empennage or tail assembly, vertical and horizontal stabilizers
  - \_\_\_\_\_c. Propeller(s) or jet engine(s)

## References

FAA Guide: *Conducting an Effective Flight Review*, Revised November 2013. Available at: <[www.faa.gov/pilots/training/media/flight\\_review.pdf](http://www.faa.gov/pilots/training/media/flight_review.pdf)>

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# Backpacking

Name \_\_\_\_\_

Do all of the following requirements (1-3):

- \_\_\_\_\_1. Review and explain or demonstrate the following material from Camping, Outdoor Cooking, and Trail Skills Trail badges:
  - \_\_\_\_\_a. Good stewardship and the Low Impact Camping method as it applies to backpacking
  - \_\_\_\_\_b. Wilderness sanitation
  - \_\_\_\_\_c. Water purification
  - \_\_\_\_\_d. Washing dishes and personal hygiene
  - \_\_\_\_\_e. Food storage and protection from animals
  - \_\_\_\_\_f. Lightweight stove safety and use
  - \_\_\_\_\_g. Trail ethics
  - \_\_\_\_\_h. Trail safety
- \_\_\_\_\_2. For the area(s) and climates in which you will hike and backpack, do the following:
  - \_\_\_\_\_a. List any animal hazards where you plan to hike (venomous snakes, bears, insects, etc.) and for each one either show a picture or point out the animal hazard in nature. Explain how to avoid the listed animals and what to do if you come in contact with them.
  - \_\_\_\_\_b. List any poisonous plants where you plan to hike (poison ivy, poison oak, poison sumac, stinging nettle, sticky nama, etc.) and for each one either show a picture or point out the plant in nature. Explain how to avoid the listed poisonous plants and what to do if you touch them.
  - \_\_\_\_\_c. Using your personal equipment list(s) developed as part of Camping Trail badge, make an individual equipment list and a group equipment list for backpacking.
  - \_\_\_\_\_d. Make a list of the key safety precautions for backpacking in your area(s).



- \_\_\_\_\_e. Restock your personal first aid kit made for First Aid Trail badge.
- \_\_\_\_\_3. Complete backpacking experience that includes:
  - \_\_\_\_\_a. At least 4 nights backcountry camping on backpack trips. Includes nights in tent, improvised shelter, permanent trail shelter open on one side, or under the stars while in the backcountry on a backpack trip. These nights may also count towards the 15 nights camping required for Camping Trail Badge and the 40 nights for the Outdoor Life Trail Badge Camping Trail requirements, but not for the Outdoor Life Trail Badge Backpacking Trail backcountry nights camping requirement.
  - \_\_\_\_\_b. At least 5 days of backpacking
  - \_\_\_\_\_c. A total BTM experience total of at least 20 hours (40 miles on level ground)

Note: See the *Backpacking Metrics* section below for the metric definitions.

## Backpacking Metrics

Metrics are used in the route and camp planning process to lay out reasonable-effort days of hiking and interesting places to camp. Guidebooks for your hiking area are also helpful for planning a trip. In order to use the metrics, you will need to read off the topographic map distances along the trail and the high and low point elevations of each up and down along the trail. The total elevation gain increases the hiking time and the aerobic effort involved in the hike whereas the total elevation loss increases the leg strain and the hiking time for steep descents.

The Backpack Time Metric (BTM) is computed as the sum of ½ hour for each mile and 1 hour for each 1,000 feet of total elevation gain and is used to estimate backpacking time to complete a particular segment of the trip.

$$BTM = \frac{1}{2} \left( \frac{\text{hour}}{\text{mile}} \right) \times \text{Distance}(\text{miles}) + 1(\text{hour}) \frac{\text{Total Elevation Gain}(\text{feet})}{1,000(\text{feet})}$$

The Backpack Effort Metric (BEM) is computed as the sum of the BTM and ½ hour for each 1,000 feet of total elevation loss and is used to estimate the overall effort or impact to the body to complete a particular segment of the trip. This metric is primarily used for trips longer than a week to ramp up and equalize effort over the duration of the trip.

$$BEM = BTM + \frac{1}{2} \left( \text{hour} \right) \frac{\text{Total Elevation Descent}(\text{feet})}{1,000(\text{feet})}$$

**Example:** Overnight in and out backpack trip that does the following over 5 miles (1-way) and then returns the same way (where the descents become the climbs and vice versa)

1.1 miles - gain 600'  
 0.5 miles - loss 300'  
 1.9 miles - gain 1,000'  
 0.9 miles - loss 700'  
 0.6 miles - gain 400'

The total elevation gain for day 1 is (600 + 1,000 + 400) = 2,000 feet and the total elevation gain for day 2 is (300 + 700) = 1,000 feet. Using the equation for BTM:

$$BTM = \frac{1}{2} \left( \frac{\text{hour}}{\text{mile}} \right) \times \text{Distance}(\text{miles}) + 1(\text{hour}) \frac{\text{Total Elevation Gain}(\text{feet})}{1,000(\text{feet})}$$

The BTM for day 1 is calculated as follows:

$$BTM(\text{day 1}) = (0.5) \times (5) + (1) \times (2,000/1,000) = 4.5 \text{ hours}$$

And the BTM for day 2 is calculated as follows:

$$BTM(\text{day 2}) = (0.5) \times (5) + (1) \times (1,000/1,000) = 3.5 \text{ hours}$$

The total elevation descent for day 1 is (300 + 700) = 1,000 feet and the total elevation descent for day 2 is (600 + 1,000 + 400) = 2,000 feet. Using the equation for BEM:

$$BEM = BTM + \frac{1}{2} \left( \frac{\text{hour}}{\text{mile}} \right) \frac{\text{Total Elevation Descent}(\text{feet})}{1,000(\text{feet})}$$

$$BEM(\text{day 1}) = 4.5 + (0.5) \times (1,000/1,000) = 5.0 \text{ hours}$$

$$BEM(\text{day 2}) = 3.5 + (0.5) \times (2,000/1,000) = 4.5 \text{ hours}$$

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# Baseball (Softball)

*This badge is targeted towards a boy in a boys baseball or a boys softball league.*

Name \_\_\_\_\_

\_\_\_\_\_ 1. Do all of the following to learn about baseball (softball):

- \_\_\_\_\_ a. Explain the basic rules of baseball (softball).
- \_\_\_\_\_ b. Demonstrate at least seven umpire signals and explain what they mean.
- \_\_\_\_\_ c. Describe basic safety rules to follow when playing baseball (softball).
- \_\_\_\_\_ d. Draw a diagram of a baseball (softball) field, labeling the dimensions, foul line, baselines and all positions. Know the area of the field you play for each position.
- \_\_\_\_\_ e. List the different ball sizes, when they are used, and for what age groups.
- \_\_\_\_\_ f. List the bat sizes and weights that are legal for different age groups.
- \_\_\_\_\_ g. List the safety equipment used in baseball (softball) for the pitcher, batter, and catcher.
- \_\_\_\_\_ h. Describe how the field, batter's box and on-deck circle are lined and what equipment is used.

\_\_\_\_\_ 2. Do one (1) of the following:

- \_\_\_\_\_ i. Research and report on the life of a famous baseball player.
- \_\_\_\_\_ j. Attend or watch a high school, college, adult, or professional baseball (softball) game.

\_\_\_\_\_ 3. Demonstrate three (3) of the following skill sets:

- \_\_\_\_\_ k. Batting: strike, ball, foul ball, bunt, grounder, line drive, and fly ball
- \_\_\_\_\_ l. Fielding: fielding a grounder, catching a line drive, catching a fly ball, and throwing to first base
- \_\_\_\_\_ m. Base running: single, double triple, leading off, base stealing, running after a caught fly ball, feet first slide, and head first slide.
- \_\_\_\_\_ n. Pitching: several different pitches such as curveball, fastball, knuckleball, slider, spin pitch. etc.
- \_\_\_\_\_ o. Catching: Catching pitches, catching foul pop-ups, throwing out base stealers

\_\_\_\_\_ 4. Over a period of at least six weeks, participate in at least twenty sessions on different days where a session can be any of the following:

- Team practice for an organized team
- A game for an organized team
- A professionally coached skills session, lesson, or class
- At least one hour of pick-up games, skill improving games, or skills practice

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# Basketball

Name \_\_\_\_\_

- \_\_\_\_1. Do the following to learn about basketball:
  - \_\_\_\_a. List the thirteen rules of basketball as developed by founder James Naismith.
  - \_\_\_\_b. Define or demonstrate the following: jump ball, traveling, three second rule, shot clock, goal tending, foul, possession arrow, rebounding, slam dunk, double dribble, and free throw.
  - \_\_\_\_c. Demonstrate at least eight referee signals and explain what they mean.
  - \_\_\_\_d. Draw a basketball court diagram showing measurements, the free-throw line, the three-point field goal area, and the sidelines.
  - \_\_\_\_e. State the size of the metal safety ring that holds the net
  - \_\_\_\_f. State the size and weight of an officially approved NBA ball and a junior sized ball.
  - \_\_\_\_g. Describe these team positions: point guard, shooting guard, forward, and center.
- \_\_\_\_2. Do 1 of the following:
  - \_\_\_\_a. Research and report on the life of a famous basketball player.
  - \_\_\_\_b. Attend or watch a high school, college, or professional basketball game.
- \_\_\_\_3. Demonstrate effectiveness in the following skills:
  - \_\_\_\_a. Passing: chest pass, bounce pass, and over the head pass.
  - \_\_\_\_b. Dribbling techniques: dribble, low dribble, and combination dribble.
  - \_\_\_\_c. Shooting: lay-up, set-shot, jump-shot, free throw, and use of the backboard
- \_\_\_\_4. Over a period of at least six weeks, participate in at least twenty sessions on different days where a session can be any of the following:

- Team practice for an organized team
- A game for an organized team
- A professionally coached skills session, lesson, or class
- At least one hour of pick-up games, shot improving games, or skills practice

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## Bible Basics

*God has given us a powerful tool – an instruction manual on how to know Him, know ourselves, and live according to His will. This manual is the Bible. As you explore the Bible, you will strengthen your knowledge of its purpose, structure, and content. You will also deepen your understanding of who God is, who you are, and who God wants you to become.*

Name \_\_\_\_\_

This Trail badge may be completed in a group setting with members of your Unit or individually with your family. The Trailman working with his family is expected to provide a summary of all discussions to his Mentor either as a written set of notes or an oral description, if the Mentor is not part of those discussions.

### Do all of the following requirements (1-3)

- \_\_\_\_1. Look at a Bible overall, including the table of contents. Open to each book of the Old and New Testaments in order, one after another, and read the title of each book. Also look at how each book is divided into chapters and verses. Then do the following:
  - \_\_\_\_a. Determine how many books there are in the Old Testament and in the New Testament.
  - \_\_\_\_b. Recite from memory or memorize and sing a song that lists the names of the books of the Old Testament, the New Testament, or both.
  - \_\_\_\_c. Read 2 Timothy 3:16-17. **Participate in a discussion of the meaning of “All Scripture is inspired by God or God-breathed” and how the Scripture (Bible) is useful to us.**
  - \_\_\_\_d. Read Mark 12:28-31. Participate in a discussion of the most important thing we must do and the second most important thing we must do.
  - \_\_\_\_e. Read James 1:22. Participate in a discussion of its meaning and make a list of several things you want to do to obey the Bible.
  - \_\_\_\_f. Describe why it is important to spend time studying the Bible.

- \_\_\_\_\_2. Participate in a group or individual Bible study covering the following verses: Genesis 1-3; Psalm 23; John 3:16-17; Romans 3:22-24; Romans 8:37-39; Matthew 28:18-20; 1 Corinthians 13; James 5:13-16; 1 Peter 1:13-16; 1 John 4:7-11; Galatians 5:22-23; and Revelation 21-22. Participate in a discussion of each of these passages and their meaning. In your discussion, answer these questions:
- What do these passages tell us about God?
  - What do these passages tell us about people?
  - What do these passages tell us about pleasing God, letting Him live in us, and living our lives for Him?
- \_\_\_\_\_3. Ask a parent or other adult to describe the character and attributes of God, as he has learned over the years from specific Bible passages and from his own experience of God's **guidance and works**.

**Do Four of the following optional requirements (4-16)**

- \_\_\_\_\_4. Create a prayer journal to record your prayer requests. Write in your journal for at least three weeks. At the end of these three weeks, look back at your requests. Explain how God answered prayers, and how He knows what we really need and always has our best in mind.
- \_\_\_\_\_5. For at least three weeks, spend 10 or more minutes per day reading from the Bible using a Bible study to direct your reading. Report what God teaches you, in writing or in another format such as video or pictures.
- \_\_\_\_\_6. For at least three weeks, read a chapter per day from a book or books of the Bible. Report what God teaches you, in writing or in another format such as video or pictures.
- \_\_\_\_\_7. Learn to use a Bible concordance such as one in your Bible, a separate book, or a version on the Internet. Find and read verses in the New Testament that address the following concepts: love, truth, works, grace, salvation, death, new life, worship, holiness. Also, think of a topic you would like to explore, and use a concordance to **learn about it in God's word**.
- \_\_\_\_\_8. Learn how to use reference study guides when reading the Bible. Demonstrate how to use one of these guides, and participate in a Bible study using a reference study guide approved by your Mentor.

- \_\_\_\_\_9. Study servant leadership (see Resources below) by doing the following:
- \_\_\_\_\_a. Discuss how you can apply principles of servant-leadership in your own life and in your Troop.
  - \_\_\_\_\_b. Read John 13:1-17 and Philippians 2:1-8. Explain who the prime example of servant leadership is and the key examples of servant leadership he performed. Discuss the significance of those acts.
  - \_\_\_\_\_c. Read Matthew 20:25-28; Mark 10:42-45; and Luke 22:24-27. Look also at the preceding verses for the context of the story. Discuss the circumstances of this event and the meaning of the response by Jesus.
  - \_\_\_\_\_d. Read the qualifications and expectations for church leadership in 1 Timothy 3:1-13; Titus 1:5-9; and 1 Peter 5:1-4. Explain what personal character traits are represented by these leadership qualifications.
  - \_\_\_\_\_e. Compare the qualifications for church leadership with what every Christian is called to (See, e.g., Matthew 6:19-20; Romans 12:13; Galatians 5:13, 22-23; Ephesians 5:18; 1 Peter 3:15; 4:8-11). Discuss the significance of this comparison.
- \_\_\_\_\_10. Pick three books of the Bible and research the context of each book by doing the following:
- \_\_\_\_\_a. List the author(s).
  - \_\_\_\_\_b. List to whom the books were written (target audience).
  - \_\_\_\_\_c. List relevant known facts about the lives of the authors.
  - \_\_\_\_\_d. Describe the historical events at the time and relevant to the writing.
  - \_\_\_\_\_e. Describe the purpose of the book.
- \_\_\_\_\_11. Working with your parents, pastor, Sunday school teacher, or other spiritual mentor, create a list of at least ten Bible verses or passages to memorize. Recite the verses from memory and explain the meaning of each verse.
- \_\_\_\_\_12. With the approval of your Mentor, select one of the great men of God in the Bible (e.g., Abraham, Moses, David, Daniel, Peter, Paul, John, etc.) and prepare a report on his life. The report may be a paper, slide presentation, speech, skit, film, video, or an alternate presentation type of your choice. The report should include the following:

- Description of his Godly character and accomplishments, how God used him, how he failed and succeeded, and how he can be a role model in your life
- Explanations of any tangible items such as maps, buildings, weapons, scrolls, clothing, animals, instruments, staffs, and stones that were noteworthy in his life
- Show such tangible items by drawing, pictures, sculpting, building models, or any other method of your choice
- Explanation of how each tangible item represents the man and might remind you of his character or accomplishments

\_\_\_\_13. After preparing the report in the requirement above, present your report to your Troop, Unit, or patrol.

\_\_\_\_14. Choose one of Jesus' parables to share with a younger Unit.

\_\_\_\_a. Create a puppet show, skit, learning game, building brick structure, collage, or any similar method of your choice, to help you present the parable to the younger Unit.

\_\_\_\_b. Read the actual parable from the Bible to the younger Unit.

\_\_\_\_15. Under the supervision of your Mentor, use the following approach to teach one or more Woodlands Trailman about God:

\_\_\_\_a. Help them create at least five structures from toy building bricks or any other material or building system to represent the mighty works of God throughout **Biblical history (e.g., Noah's Ark, Tower of Babel, Walls of Jericho, Ark of the Covenant, Tabernacle, Temple, Empty Tomb, etc.)**.

\_\_\_\_b. Display the structures on a table, with a card or label for each citing the Bible references used to build them.

\_\_\_\_c. Coach the Woodlands Trailman so he can present to his Unit what God did in each situation and why.

\_\_\_\_16. Lead a Bible study on identity in Christ for a younger Unit or patrol using material that is approved by your Mentor and their parents, age-appropriate, and Biblically based.

## Resources



**Servant Leaders.** Servant-leaders aspire to be great only in their service to others. They are committed to serving others with integrity; humility; sincere concern; a generous, forgiving and giving heart; and self-discipline. They relate to others by investing, empowering, caring for, and consulting others. They are willing to sacrifice personally for the well being of others.

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# Blacksmithing

*Knowledge and experience in the way things used to be done develops an interest in the pioneer history of our country. The blacksmithing trail badge introduces the Trailman to the history of metal working, as well as an appreciation of hand-made tools and metal art.*

Name \_\_\_\_\_

## Do all of the following requirements (1-5)

- \_\_\_\_1. Participate in individual or group blacksmith learning activities that cover at least the following:
  - \_\_\_\_a. History of blacksmithing
  - \_\_\_\_b. Different types of metals and their uses in blacksmithing
  - \_\_\_\_c. Commonly used blacksmithing equipment and tools
  - \_\_\_\_d. Blacksmithing terms: iron, steel, cast iron, mild steel, slag, clinkers, coal, coke, scale, charcoal, anvil, forge, drawing, and upsetting
- \_\_\_\_2. Participate in a blacksmith safety orientation so that you know the injury risks, safety rules, safety gear, and safe clothing for blacksmithing.
- \_\_\_\_3. Participate in one of the following blacksmithing skills learning activities:
  - \_\_\_\_a. Blacksmithing class or workshop
  - \_\_\_\_b. Blacksmith apprentice volunteer or worker
  - \_\_\_\_c. Other hands-on learning blacksmithing experience
- \_\_\_\_4. Make three different items by blacksmithing. Preserve each item from oxidation by cleaning and applying a finish. Suggested items to make include: a tent stake, a wall hook, a fire poker, a candleholder, and a key fob. Include the following techniques:
  - \_\_\_\_a. U-shaped bend in at least one item
  - \_\_\_\_b. L-shaped bend in at least one item
  - \_\_\_\_c. Decorative twist in at least one item
- \_\_\_\_5. Share your projects by doing one of the following:
  - \_\_\_\_a. Display your completed items at a troop meeting.
  - \_\_\_\_b. Enter your completed items in a local or county fair.
  - \_\_\_\_c. Use your completed items at home or on a camping trip.

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# Boating Safety

Name \_\_\_\_\_

Safety, navigation, skills, emergencies, or equipment operation courses or seminars from a provider listed on the US Coast Guard Boating Safety Resource Center that applies to powerboats or sailboats (not personal watercraft or paddle craft) and that requires at least three hours to complete may be used for any course requirements listed below. Combinations of related courses or seminars may be used to meet the minimum time requirement. Some online courses are free and only charge for a boater education card or boating license (in a small number of states). It is not necessary to purchase the card to complete the requirement. Print a copy of the page that states that you qualified to purchase such a card and that is sufficient to verify successful participation in the class.

Do all of the following requirements (1-6)

- \_\_\_\_1. Complete the Aquatics trail badge or do the following:
  - \_\_\_\_a. Complete the Swimming Competency Test at the Swimmer level.
  - \_\_\_\_b. Demonstrate the proper way to put on a personal flotation device (PFD)
  - \_\_\_\_c. Demonstrate that the PFD is properly fitted for your use.
  - \_\_\_\_d. Explain why a PFD should always be worn while boating.
  - \_\_\_\_e. Demonstrate throwing a floatable object to a distressed person in the water.
- \_\_\_\_2. Participate in a Safe Aquatics Method and boating safety orientation that includes the following:
  - \_\_\_\_a. Discussion with your Mentor about your personal swimming abilities, comfort with being near or in the water, and their impact on your boating choices.
  - \_\_\_\_b. Presentation on the five types of PFDs and their uses.
  - \_\_\_\_c. Explanation of weather conditions that preclude boating activities
- \_\_\_\_3. Using pictures or actual boats:

- \_\_\_\_\_a. Identify the port, starboard, aft, and forward directions.
- \_\_\_\_\_b. Identify the stern, bow, deck, gunwales, cockpit, transom, keel, stem, and sole.
- \_\_\_\_\_c. Identify and explain the function of the companionway, locker, mast, boom, cleat, chock, hatch, porthole, and bilge.
- \_\_\_\_\_4. Complete a boating safety course.
- \_\_\_\_\_5. Demonstrate your ability to tie a cleat hitch, and to secure a line with an eye splice to a pile or dolphin, and the eye splice to a horn cleat.
- \_\_\_\_\_6. Learn the following emergency responses:
  - \_\_\_\_\_a. Demonstrate appropriate visual signals for communicating vessel distress or an emergency situation to a passing boater.
  - \_\_\_\_\_b. Describe the procedures for vessel occupants to follow during a vessel capsizing or sinking.
  - \_\_\_\_\_c. Describe the best procedures to avoid the capsizing or sinking, especially for vessel capacity, vessel trim and hazardous weather.
  - \_\_\_\_\_d. Verbally demonstrate how to complete a vessel distress call on a VHF marine radio for a sinking or capsized vessel. For this example distress call, use the following details for your observations:
    - Distressed vessel: 16-foot runabout; 40 horsepower outboard engine
    - Persons aboard: two adults and two children ages 4 and 10
    - Water location: pick a familiar location in your geographic area

**Do three of the following optional requirements (7-17)**

- \_\_\_\_\_7. Complete an additional boating safety, navigation, skills, emergencies, or equipment operation course different from others previously completed.
- \_\_\_\_\_8. Complete an additional boating safety, navigation, skills, emergencies, or equipment operation course different from others previously completed.
- \_\_\_\_\_9. Complete an additional boating safety, navigation, skills, emergencies, or equipment operation course different from others previously completed.
- \_\_\_\_\_10. Demonstrate your ability to tie the following knots and explain their uses in boating: square (reef) knot, figure eight, two half hitches, sheet bend, and bowline.

- \_\_\_\_11. Explain the advantages and disadvantages of the following:
- \_\_\_\_a. Manila, nylon, polypropylene, and Dacron rope materials.
  - \_\_\_\_b. Twisted and braided rope construction.
- \_\_\_\_12. Through the use of diagrams, models, drawings or a boat, demonstrate the proper use of spring lines and breast lines for making a vessel fast in both of the following situations:
- \_\_\_\_a. Stern of vessel secured to pier or wharf, and bow secured to piles or dolphins.
  - \_\_\_\_b. Port of vessel secured to pier or wharf, with additional vessels forward and aft **of your vessel's berth area.**
- \_\_\_\_13. Create or replenish a first aid and emergency kit for your boat that prepares you to respond to at least the following:
- \_\_\_\_a. Cuts, scrapes, insect bites or stings, blisters
  - \_\_\_\_b. Dehydration, heat exhaustion, and heatstroke
  - \_\_\_\_c. Burns (superficial, partial-thickness, and full-thickness)
  - \_\_\_\_d. Severe bleeding, breathing emergencies, heart attack, and stroke
  - \_\_\_\_e. Person in water in distress or drowning
  - \_\_\_\_f. Engine failure and fires
  - \_\_\_\_g. Rough seas due to storms
- \_\_\_\_14. Complete either of the following as appropriate to your situation:
- \_\_\_\_a. Inspect a vessel for proper safety equipment prior to having the vessel undergo a passing vessel safety check.
  - \_\_\_\_b. Outline on paper specific steps and contacts to make to arrange for a vessel safety check by a trained Vessel Examiner. Prepare a list of the required safety equipment as necessary to successfully pass a vessel safety check for a hypothetical vessel consisting of a 16-foot runabout with a 40 horsepower outboard engine.
- \_\_\_\_15. Explain the differences between aerial and hand-held flares and the advantages and disadvantages of each.

- \_\_\_\_\_16. Explain the procedural steps and methods to extinguish a small fire using a hand-held fire extinguisher.
- \_\_\_\_\_17. Demonstrate extinguishing a small fire using a hand-held fire extinguisher.

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# Bowling

Name \_\_\_\_\_

- \_\_\_\_\_ 1. Do all of the following to learn about bowling:
- \_\_\_\_\_ a. Explain the bowling rules of play.
  - \_\_\_\_\_ b. Explain the bowling scoring system and the difference between scoring a spare and a strike.
  - \_\_\_\_\_ c. Explain league play, handicapping, and scoring.
  - \_\_\_\_\_ d. Describe the different ball weights and materials, and explain the reason different materials are used.
  - \_\_\_\_\_ e. Explain the reasons for using two different balls during the same game.
  - \_\_\_\_\_ f. Describe the bowling lane and explain why there are arrows on the lanes.
  - \_\_\_\_\_ g. List and explain at least four different types of modern era pins.
  - \_\_\_\_\_ h. Explain the difference in bowling styles and approaches.
  - \_\_\_\_\_ i. Explain what pin is to be hit, and where to properly hit it to pick up a split.
- \_\_\_\_\_ 2. Do one (1) of the following requirements
- \_\_\_\_\_ j. Describe the early origins of bowling and what event standardized the game.
  - \_\_\_\_\_ k. Describe several major professional bowling tours.
  - \_\_\_\_\_ l. Read a biography of a famous professional bowler.
  - \_\_\_\_\_ m. Attend or watch a professional bowling tournament.
- \_\_\_\_\_ 3. Demonstrate the five-step and the three-step approach.
- \_\_\_\_\_ 4. Over a period of at least six weeks, participate in at least twenty sessions on different days where a session can be any of the following
- Team practice for an organized team
  - League or team game (at least three games)
  - A professionally coached skills session, lesson, or class
  - Bowling on your own with family or friends (at least three games)

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# Camp Counselor

Name \_\_\_\_\_

Note: You must be an Adventurer to complete this Trail Badge.

Do all of the following requirements (1-4)

- \_\_\_\_\_1. Complete the nine required Trail Badges for Ready Trailman and the Emergency Preparedness Trail Badge.
- \_\_\_\_\_2. Volunteer for a total of six hours as a helper for a Woodlands Trail patrol, Sunday school class, vacation Bible school (VBS), or any combination of these.
- \_\_\_\_\_3. Read the Trail Life USA Health and Safety Guide. Do the following:
  - \_\_\_\_\_a. Make a list of camp safety rules for Woodlands Trail, Navigators, and Adventurers ages.
  - \_\_\_\_\_b. Explain the progressive outdoor activities appropriate to the ages of Trailmen.
  - \_\_\_\_\_c. List the required adult leader/camper ratios
  - \_\_\_\_\_d. Review the Trailman Oath and explain how you can model the behaviors described in each of the five lines to a younger Trailman.
- \_\_\_\_\_4. Make a facility plan a summer camp facility for Woodlands Trailmen, Navigators, Adventurers, or any combination thereof. Include the following:
  - \_\_\_\_\_a. Floor plan sketches for buildings that could include play and quiet areas, kitchen/dining areas, toilet and shower rooms, and sleeping areas.
  - \_\_\_\_\_b. Tent areas including camp layout, sleeping capacity,
  - \_\_\_\_\_c. Emergency procedures

- \_\_\_\_\_d. Maximum number of children and adults allowed
- \_\_\_\_\_e. Required employees

Do three of the following optional requirements (5-13)

- \_\_\_\_\_5. **Read Chapter One Leadership in The Trailmen's Handbook. Explain the following:**
  - \_\_\_\_\_a. The four selves and how each is important for modeling positive behaviors for campers.
  - \_\_\_\_\_b. The proper attitude for a camp counselor
  - \_\_\_\_\_c. How to be a good role model
- \_\_\_\_\_6. **Read Chapter Five Fitness in The Trailmen's Handbook. Describe each of the four types of fitness and list ways to provide positive camp experiences in each type of fitness.**
- \_\_\_\_\_7. Under the supervision of appropriate adult leaders, plan a field trip for a Woodlands Trailmen or another group of younger children. Go on the field trip with them.
- \_\_\_\_\_8. Plan and run a Woodlands Trail patrol meeting using a standard meeting plan approved by your Mentor and the Woodlands Trail Ranger.
- \_\_\_\_\_9. Select a Woodlands Trail or Navigators patrol. Do the following:
  - \_\_\_\_\_a. Teach them a fun campfire song and perform it with them.
  - \_\_\_\_\_b. Teach them a funny campfire skit and perform it with them.
  - \_\_\_\_\_c. Teach them a game, sport, or other activity and do it with them.
- \_\_\_\_\_10. Choose a Trail Badge you have earned that would work to teach at a summer adventure. Make a plan to teach the badge so that a qualified Trailman can complete the badge during a weeklong summer adventure. Assume you have a minimum of four blocks of time two hours long.
- \_\_\_\_\_11. Make a camp activities kit containing materials for quick activities for youth waiting for their turn on equipment or trapped inside by a thunderstorm.

\_\_\_\_\_12. Childhood developmental disorders affect the growth of a child in several ways. Pick three of the disorders below and list the signs and symptoms of each. Explain methods of helping a child with each disorder have a positive camp experience.

- Attention Deficit/Hyperactivity Disorder
- Autism
- Dyslexia
- Down's syndrome
- Cerebral Palsy
- Tourette's Disorder
- Obsessive - Compulsive Disorder

- \_\_\_\_\_13. Explore a career in camp program implementation or management and the qualifications necessary for members of camp staff, by interviewing a Camp Program Director or other senior staff member at a camp. Locate the closest Institution to provide the training for this career.

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# Canoeing

Name \_\_\_\_\_

The purpose of this badge is to learn the basic terminology and skills to safely control a canoe on flat-water in preparation for a river trip or mixed river and lake back country trip. All canoeing activities in the water or at the waterfront require wearing of a properly fitted personal flotation device (PFD) and must follow the Safe Aquatics Method and the Trail Life USA Health and Safety Guide. All persons participating in Canoeing Trail badge for credit or as a canoe partner, must have completed requirement one or the equivalent prior to working on the in canoe portion of the Trail Badge starting at requirement 5.

Do all of the following requirements (1-11)

## Preparation

- \_\_\_\_1. Complete the Aquatics Trail Badge or do the following before doing in canoe requirements:
  - \_\_\_\_a. Complete the Swimming Competency Test at the Swimmer level.
  - \_\_\_\_b. Demonstrate the proper way to put on a personal flotation device (PFD)
  - \_\_\_\_c. Demonstrate that the PFD is properly fitted for your use.
  - \_\_\_\_d. Explain why a PFD should always be worn while canoeing.
  - \_\_\_\_e. Demonstrate throwing a floatable object to a distressed person in the water.
- \_\_\_\_2. Participate in a Safe Aquatics Method and canoeing safety orientation that includes the following:
  - \_\_\_\_a. Discussion with your Mentor about your personal swimming abilities, comfort with being near or in the water, and their impact on your canoeing choices
  - \_\_\_\_b. Explanation of the importance of sun protection while on the water
  - \_\_\_\_c. Explanation of weather conditions that preclude canoeing activities

- \_\_\_\_\_d. Explanation of appropriate clothing for canoeing at the water front and for canoeing in the back country
  - \_\_\_\_\_e. Explanation of the benefits of kneeling in a canoe and conditions under which it may be appropriate to sit in a canoe
  - \_\_\_\_\_f. Discussion of the basic safety procedures in canoeing for: someone who has fallen overboard, being caught in a sudden storm or in the dark, a capsized canoe.
- \_\_\_\_\_3. Using pictures or a paddle and a canoe:
- \_\_\_\_\_a. Identify the parts of a canoe: keel, gunwales, bow, stern, seats, and thwarts.
  - \_\_\_\_\_b. Identify the parts of a paddle: grip, shaft, neck, blade and tip.
  - \_\_\_\_\_c. Identify and explain what keeps the canoe afloat.
  - \_\_\_\_\_d. Demonstrate or explain how to pick the proper paddle for your height.

### **Strokes and Paddling**

- \_\_\_\_\_4. On dry land or kneeling on a dock, practice and demonstrate on both sides the following:
- \_\_\_\_\_a. Properly holding a paddle
  - \_\_\_\_\_b. Feathering a paddle
  - \_\_\_\_\_c. Straight: forward stroke, hold water, reverse stroke (back paddle)
  - \_\_\_\_\_d. Turning: J stroke (stern only), forward sweep, reverse sweep, draw, push away
- \_\_\_\_\_5. While positioned in the bow of the canoe with a partner in the stern, comfortably demonstrate the following on both sides:
- \_\_\_\_\_a. Properly holding a paddle
  - \_\_\_\_\_b. Feathering a paddle
  - \_\_\_\_\_c. Straight: forward stroke, hold water, reverse stroke (back paddle)
  - \_\_\_\_\_d. Turning: forward sweep, reverse sweep, draw, push away



- \_\_\_\_\_e. Pivot your canoe in a full circle to the starboard and a full circle to the port.
- \_\_\_\_\_f. Paddle in a straight line for 150 yards using strokes commanded by partner in stern
- \_\_\_\_\_6. Demonstrate how to properly change positions while in a canoe.
- \_\_\_\_\_7. While positioned in the stern of the canoe with a partner in the bow, comfortably demonstrate the following on both sides:
  - \_\_\_\_\_a. Properly holding a paddle
  - \_\_\_\_\_b. Feathering a paddle
  - \_\_\_\_\_c. Straight: forward stroke, hold water, reverse stroke (back paddle)
  - \_\_\_\_\_d. Turning: J stroke (stern only), forward sweep, reverse sweep, draw, push away
  - \_\_\_\_\_e. Pivot your canoe in a full circle to the starboard and a full circle to the port.
  - \_\_\_\_\_f. Using J-stroke and any others in combination with strokes commanded for the partner in the bow, paddle in a straight line for 150 yards
- \_\_\_\_\_8. With a partner, demonstrate how to safely do the following:
  - \_\_\_\_\_a. Carry a canoe from storage to the launch site.
  - \_\_\_\_\_b. Launch a canoe from a dock and from shore.
  - \_\_\_\_\_c. Properly hold the canoe for your partner to enter.
  - \_\_\_\_\_d. Get in and out of a canoe.
  - \_\_\_\_\_e. Kneel properly in a canoe for the best stability and power.
  - \_\_\_\_\_f. Stow your paddle.
  - \_\_\_\_\_g. Secure your gear using square knots.
  - \_\_\_\_\_h. Land a canoe at a dock and at the shore.
  - \_\_\_\_\_i. Remove the canoe from the water; carry it back and put it away.

### Rescues

- \_\_\_\_\_9. Demonstrate how to rescue someone who has fallen out of a canoe.

- \_\_\_\_\_a. While in deep water with a partner and an empty canoe, demonstrate that you can enter the canoe while the partner remains in the water holding the gunwale for stability.
- \_\_\_\_\_b. Once in the canoe, use your weight to stabilize the canoe while your partner in the water also enters.
- \_\_\_\_\_10. Learn and then demonstrate how to properly capsize your canoe.
  - \_\_\_\_\_a. Once capsized, turn the swamped canoe over and get into it. Hand paddle the canoe for a minute.
  - \_\_\_\_\_b. Get out of the swamped canoe and turn it upside down again and swim the canoe at least 15 yards to shallow water.
  - \_\_\_\_\_c. Now, stand and empty the canoe.
- \_\_\_\_\_11. Working with another canoe, demonstrate how to do a canoe-over-canoe rescue. Then do the following:
  - \_\_\_\_\_a. While in deep water with two canoes and two people in each canoe, demonstrate how to rescue an adult-sized person in the water while one person in your canoe holds the gunwales of the second canoe for stability, and the other assists the person getting into the canoe.
  - \_\_\_\_\_b. Demonstrate how the canoe can be tilted toward a person having difficulty to help them get out of the water, and then tilted to assist lifting them out of the water.
  - \_\_\_\_\_c. Describe procedures for warming a person who has been rescued from cold water.

**Do three of the following optional requirements (12-23)**

- \_\_\_\_\_12. Create a basic first aid and emergency kit that for a one-day river trip that prepares you to respond to at least the following: blisters, sunburn, cuts, heat stroke, dehydration, insect bites or stings, heat exhaustion.
  - \_\_\_\_\_a. Cuts, scrapes, insect bites or stings, blisters, sunburn
  - \_\_\_\_\_b. Hypothermia, dehydration, heat exhaustion, and heatstroke
  - \_\_\_\_\_c. Severe bleeding, breathing emergencies, heart attack, and stroke

- \_\_\_\_\_d. Person in water in distress or drowning
- \_\_\_\_\_e. Rough waters due to storms
- \_\_\_\_\_13. Design a course and have a canoe race while following all safety procedures.
- \_\_\_\_\_14. Participate in a canoe scavenger hunt with clues that take you to different landing points around the lakeshore.
- \_\_\_\_\_15. With other canoes, have a splash ball game. Toss the splash balls between the canoes and retrieve them. This will help you learn to maneuver your canoe.
- \_\_\_\_\_16. With other canoes on a large lake, use landmarks to sight a course that would require a half-hour of paddling and then follow it.
- \_\_\_\_\_17. In still water over your head, while a canoe is capsized and upside-down there is an air pocket underneath it. Go underneath a capsized canoe and come up into the air pocket and do the following:
  - \_\_\_\_\_a. While under the canoe you can breathe normally and talk to your partner. Coordinate which direction you will flip the canoe.
  - \_\_\_\_\_b. Place your hands on opposite gunwales and count to three.
  - \_\_\_\_\_c. On three, kick hard to lift your chest out of the water and raise your arms to lift and drain the canoe.
  - \_\_\_\_\_d. Then quickly flip the canoe over. If done properly, much of the water will be out.
  - \_\_\_\_\_e. Climb in without letting any additional water in and paddle to shore.
- \_\_\_\_\_18. Learn and demonstrate how to portage a canoe. Explain the situations under which this might be necessary.
- \_\_\_\_\_19. Define painter and do the following
  - \_\_\_\_\_a. Point out the attachment points on the bow and stern for painters.
  - \_\_\_\_\_b. Use a bowline to tie painters to the bow and stern of a canoe and demonstrate lining a canoe through a section of river.
- \_\_\_\_\_20. Using the **taut-line hitch**, **two half hitches**, and **truckers' hitch as needed**, secure a canoe for transport on a trailer, canoe rack, or car roof (using pads).

- \_\_\_\_\_21. Take a canoe out solo and demonstrate the following:
- \_\_\_\_\_a. Proper solo kneeling position
  - \_\_\_\_\_b. Full circle pivots to starboard and port
  - \_\_\_\_\_c. Guide the canoe in a straight line for 150 yards.
- \_\_\_\_\_22. Create a float plan for your next paddling trip and do the following:
- \_\_\_\_\_a. Explain why is a float plan important and who should have a copy.
  - \_\_\_\_\_b. List the personal and group equipment needed for an overnight paddle trip.
  - \_\_\_\_\_c. Demonstrate the proper way to stow and secure equipment.
  - \_\_\_\_\_d. Demonstrate the use of waterproof dry bags for canoe expeditions.
- \_\_\_\_\_23. Learn about canoe and paddle designs and do the following:
- \_\_\_\_\_a. List at least four materials used to make canoes and their advantages and disadvantages.
  - \_\_\_\_\_b. List the kind and amount of repair materials and tools you should keep or carry on trips for each canoe material.
  - \_\_\_\_\_c. Describe proper maintenance and upkeep for canoes including storage, transportation and repairs.
  - \_\_\_\_\_d. Explain how length, beam and shape of canoes affect their handling and how to choose a canoe design best for trip type and water characteristics.
  - \_\_\_\_\_e. Explain which type of paddle should be used based on type of trip, water conditions and whether you are solo or paddling with a partner.

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## Christian Faith Activities

These requirements may be done in the family, unit, or church setting at the discretion of the boy's family.

Name \_\_\_\_\_

### Do all of the following requirements (I-2)

- \_\_\_\_1. Describe the concept of the Trinity and each person of the Triune God.
- \_\_\_\_2. Make a list of religious practices and do them for four weeks.
  - Practices could include praying, singing, daily Bible reading, participating in a Bible study, attending church or Sunday school, or treating others with respect, love and kindness.
  - The number of practices is left to the youth and his parent or Mentor to select.

### Do five of the following requirements (3-14) with at least one from each topic

#### Faith (Do at least one)

- \_\_\_\_3. Invite a religious leader to your home or unit meeting. Possible leaders include those from your church or from your troop's church and may be either professional staff (ministers, pastors, priests, bishops, etc.) or lay leaders (Sunday school teachers, elders, deacons, etc.). Participate in a faith discussion using the following suggested discussion questions:
  - What is faith?
  - Who are some people who have publicly demonstrated their faith?
  - What good qualities do people of strong Christian faith possess?
  - What are some ways we can incorporate those qualities into our lives?
  - What problems do people of faith face and how do they overcome them?

- What challenges might you encounter in exercising your faith?
- Who can help you with those challenges?

\_\_\_\_ 4. Participate in a family faith discussion using the suggested discussion questions above and discuss the following with your family:

\_\_\_\_ a. The importance of faith in God

\_\_\_\_ b. How your family demonstrates your faith

\_\_\_\_ 5. Discuss with your Mentor, Chartered Organization Representative, or Troop Chaplain the values Christian religious faith has in common with the Trail Life USA Oath and Motto.

\_\_\_\_ 6. Explain the difference between believing in Jesus and actually living the Christian lifestyle.

#### **Community (Do at least one)**

\_\_\_\_ 7. In addition to any church services attended as part of requirement 2, attend a special Christmas, Easter, or other church holiday service and discuss what you learned about the specific holiday message with your family or Mentor.

\_\_\_\_ 8. Learn the words to a new worship song or hymn, or teach your family or unit a prayer or song for grace before a meal.

\_\_\_\_ 9. Perform the invocation or benediction for a troop awards ceremony or special event, or perform or lead grace before two meals on a campout.

\_\_\_\_ 10. Coordinate with your pastor to perform an act of service for your church, your troop's church, or through one of their ministries.

#### **Church History (Do at least one)**

Church history resources include:

- "The 100 Most Important Events in Christian History," AK Curtis, JS Lang and R Petersen, Grand Rapids, MI: Fleming H. Revell, 1991.
- "Famous Men of the Renaissance and Reformation," RG Shearer, Lebanon, TN: Greenleaf Books, 1996.
- National Catholic Committee on Scouting (NCCS) religious activities, including:

- The Rosary Series
- The Footsteps of American Saints

\_\_\_\_\_II. Explain the following for the phrase "Forgive us our debts (trespasses) as we forgive our debtors (those who trespass against us)."

- \_\_\_\_\_a. Where it is found in the Bible
- \_\_\_\_\_b. Who said it
- \_\_\_\_\_c. What famous prayer contains it
- \_\_\_\_\_d. What the phrase means in the context of that prayer

\_\_\_\_\_I2. Learn about and describe an important event or person in the history of Christianity or complete an NCCS Religious Activity.

\_\_\_\_\_I3. Repeat requirement I2 with a different event, person or NCCS Religious Activity than that used to complete requirement I2.

\_\_\_\_\_I4. Repeat requirement I2 with a different event, person or NCCS Religious Activity than those used to complete requirements I2 and I3.

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# Cinematography

Name \_\_\_\_\_

Do all of the following requirements (1-3)

- \_\_\_\_1. Learn the parts and functions of your video camera and basic video camera techniques. Do the following:
  - \_\_\_\_a. Identify the listed video camera parts and demonstrate their use: power connector, power button, battery, microphone, lens, zoom buttons, focus, and controls (start, stop, play, record)
  - \_\_\_\_b. Using a tripod, pan the camera left and right and in and out several times at different speeds to learn what is too fast or too slow. Practice panning and then demonstrate panning smoothly.
  - \_\_\_\_c. Explain when you would want to use a tripod, and when you would want to hand hold the camera. Shoot a scene both ways, and explain the difference.
  - \_\_\_\_d. Learn about shot composition, and demonstrate how to position a person in the video image. Explain what happens when a person is not properly framed such as cutting off tops of heads, looking off screen, too much area over the head, etc.
  - \_\_\_\_e. Practice zooming the image in and out, and describe when you would want to zoom fast or slow. Determine if the image shakes more when you are zoomed in or zoomed out. Explain why it might be a better idea to move the camera closer than to use the zoom function.
- \_\_\_\_2. Using a Trail Life Ceremony (e.g. opening or closing of a meeting, flag ceremony), learn how to create storyboards, and then shoot video using them as a guide.
  - \_\_\_\_a. Create a storyboard of how you intend to videotape the event. The storyboard should include pictures of what you are going to shoot, how you plan to shoot them (camera angle, close up shots, etc.) and descriptions of what is happening in the segments.



- \_\_\_\_\_b. Videotape the ceremony using the storyboard as your guide.
- \_\_\_\_\_c. Explain how the storyboard helped you plan the videotaping, and describe what you wished you had included in the storyboard.
- \_\_\_\_\_3. By yourself or with a buddy, create a short film of at least 5 minutes duration, and show it.
  - \_\_\_\_\_a. Develop a story concept.
  - \_\_\_\_\_b. Write a script for the show and include, as appropriate, music, costumes, props and sound effects.
  - \_\_\_\_\_c. Create storyboards of how you will film it.
  - \_\_\_\_\_d. Film the story using a video camera and then edit it using video editing software.

To be a good citizen, you must live in the past, present and future. Do three of the following optional requirements (4-11)

- \_\_\_\_\_4. Research the film ratings system.
  - \_\_\_\_\_a. Explain what the symbols mean.
  - \_\_\_\_\_b. Explain when the system was developed and why.
  - \_\_\_\_\_c. Explain how the system has changed over the years.
  - \_\_\_\_\_d. Describe your opinion of the helpfulness and accuracy of the rating system.
- \_\_\_\_\_5. Find out what the terms “blue screen” and “green screen” refer to and describe how it works. Watch a documentary on the making of a movie that uses this technology.
- \_\_\_\_\_6. Watch a movie and notice the special effects, including makeup. Learn about how and when special effects are added.
- \_\_\_\_\_7. Watch a silent movie. Discuss the accommodations filmmakers made for lack of sound. Choose a campfire skit or write one of your own, turn it into a silent movie, and present it.
- \_\_\_\_\_8. Choose a product. Write and videotape a thirty-second commercial. Edit your commercial using a computer program.

- \_\_\_\_\_9. Learn about different careers in the movie or video fields. Give a brief explanation of the following jobs: actor, director, producer, cinematographer, key grip, gaffer, best boy, film editor, sound designer, costume designer and set designer. Choose three of these careers and find out what kind of education is required and what salary one might expect.
- \_\_\_\_\_10. Tour a video production facility or TV station to learn about sets, lighting, editing and the people that work there.
- \_\_\_\_\_11. Practice making different sound effects (for example, twist a thin cookie sheet for thunder). Demonstrate ways to make at least three more sounds.

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## Climb On!

Name \_\_\_\_\_

Do all of the following requirements (1-3)

- \_\_\_\_1. Participate in a climbing safety orientation covering safety rules for indoor and outdoor climbing and do the following:
  - \_\_\_\_a. Explain the five classes and the subclasses of class 5 in the Yosemite Decimal System (YDS) rock climbing difficulty classification system. The novice may find the descriptions of the subclasses of class 5 from Mountaineering, Freedom of the Hills helpful. It is available on numerous web sites.
  - \_\_\_\_b. List the safety equipment needed for rock climbing.
  - \_\_\_\_c. Demonstrate the proper way to inspect, put on, and fit a harness and helmet.
  - \_\_\_\_d. List the clothing appropriate for rock climbing indoors and outdoors.
  - \_\_\_\_e. Demonstrate proper rope choice, care, inspection, coiling in a butterfly coil, and management. Explain why these are crucial.
  - \_\_\_\_f. Explain how to identify wear in a rope and determine when it is appropriate to retire a rope.
  - \_\_\_\_g. Explain the difference between static and dynamic rope and when it is most appropriate to use each.
- \_\_\_\_2. Demonstrate tying the following knots using a climbing rope, webbing, and harness as appropriate. Explain the use and importance of each knot.
  - \_\_\_\_a. Figure eight and figure eight on a bight
  - \_\_\_\_b. Rewoven figure eight and safety knot



- \_\_\_\_\_c. Water knot and safety knot for webbing
- \_\_\_\_\_d. Double fisherman's knot
- \_\_\_\_\_3. Demonstrate the climbing verbal signals used between (see Resources below):
  - \_\_\_\_\_a. Climber and Belay
  - \_\_\_\_\_b. Rappeller and Belay
  - \_\_\_\_\_c. Boulderer and Spotter

### **Do seven optional requirements with at least three from Climbing Experience**

#### **Climbing Experience (Do at least three)**

Each of the requirements in the Climbing Experience topic must be done under appropriate adult supervision and any of the requirements taking place at a natural rock-climbing site must also be done under the supervision of a certified guide. For further information and guidance, please see the Health and Safety Guide.

- \_\_\_\_\_4. Participate in belaying training to be able to belay and do the following:
  - \_\_\_\_\_a. Demonstrate the appropriate way to use and fasten a carabiner and belay device.
  - \_\_\_\_\_b. Demonstrate the appropriate use of belayer commands.
  - \_\_\_\_\_c. Perform a belaying equipment check.
  - \_\_\_\_\_d. Demonstrate the appropriate way to take up slack and lower a climber.
  - \_\_\_\_\_e. Demonstrate the proper reactions for a fall.
  - \_\_\_\_\_f. Belay at least 5 climbs.
- \_\_\_\_\_5. At a climbing wall or rock gym, climb at least five routes using a properly trained belayer, safety equipment, and verbal signals.
- \_\_\_\_\_6. Climb at least five different classified routes to estimate your YDS climbing level.
- \_\_\_\_\_7. Take part in an outdoor climbing adventure at a natural climbing site.

- \_\_\_\_\_a. Ask for and list the estimated YDS rating and any hints for each climb route.
- \_\_\_\_\_b. Climb at least 5 routes.
- \_\_\_\_\_8. Learn and demonstrate the following moves:
  - \_\_\_\_\_a. Flag
  - \_\_\_\_\_b. Gaston
  - \_\_\_\_\_c. Heal hook
  - \_\_\_\_\_d. Mantle
  - \_\_\_\_\_e. Match
  - \_\_\_\_\_f. Side pull
  - \_\_\_\_\_g. Sit start
  - \_\_\_\_\_h. Smearing
  - \_\_\_\_\_i. Toe hook
- \_\_\_\_\_9. Using a belayer, rappel down five different routes on a climbing wall or natural rock face. Each rappel should cover at least thirty feet vertically.
- \_\_\_\_\_10. Using a spotter and crash pad, go bouldering and complete ten different bouldering problems (climbs) at a climbing wall, rock gym, natural bouldering site, or combination thereof.
- \_\_\_\_\_11. Join a climbing club or team and participate for at least two months.
- \_\_\_\_\_12. Participate in a climbing competition.
- \_\_\_\_\_13. Participate in five different **climbing training games** such as “Add-on” – see the Resources for the rules to Add-on and other climbing games.
- \_\_\_\_\_14. Take an organized climbing lesson or class offered to the public (see Resources below).

### Climbing Knowledge

- \_\_\_\_\_15. At a natural climbing site, evaluate the appropriateness of a climbing area and identify potential climbing hazards.

- \_\_\_\_\_16. Demonstrate the proper prevention and responses to common climbing injuries and illnesses and describe how to summon aid.
- \_\_\_\_\_17. Define the following climbing terms:
- Anchor      Dyno
  - Arête      Flash
  - Chimney      Quickdraw
  - Clipping in      Traverse
  - Crimper      Undercling
  - Crux
- \_\_\_\_\_18. Attend a climbing competition as a spectator.
- \_\_\_\_\_19. Explain the difference between an ATC and gri-gri belay device and the conditions under which the use of each is appropriate.
- \_\_\_\_\_20. Explain the difference between top rope climbing and lead climbing including differences in equipment and the conditions under which each is appropriate. Explain the difference between traditional climbing and sport climbing including differences in equipment and the conditions under which each is appropriate.
- \_\_\_\_\_21. Take a course in how to set top rope anchors.
- \_\_\_\_\_a. Demonstrate the keys to a safe anchor system.
  - \_\_\_\_\_b. Demonstrate the appropriate ways to use natural anchors when in an outdoor setting.
- \_\_\_\_\_22. Design your own climbing route. Describe your planned holds, moves you expect the climber to use on the route, the expected YDS classification, and a name for the route.

## Resources

Note: Each activity done for Climbing Experiences may count towards only one requirement. For example, the five climbs in requirement 5 may not be used for 6 or 7.b and any activities in an organized climbing class may be used only for requirement 14 or for another requirement, but not both.



Class 5 subclass descriptions: <http://www.climber.org/data/decimal.html#fifth>

Climbing games: [http://www.indoorclimbing.com/climbing\\_games.html](http://www.indoorclimbing.com/climbing_games.html)

Example of climbing lesson or class: <http://www.yosemitepark.com/rock-climbing-lessons.aspx>

Climber and Belayer verbal signals:

On Belay ... Belay On

Climbing ... Climb On

Slack

Up Rope

Falling

Tension ... Got You

Ready to Lower ... Lowering

Rock ... Rock

Rope ... Rope

Off Belay ... Belay Off

Rappeller and Belayer verbal signals:

On Belay ... Belay On

Rappelling ... Rappel On

Falling

Rock ... Rock

Off Belay ... Belay Off

Off Rope

Boulderer and Spotter verbal signals:

Spotters Ready ... Ready

Climbing ... Climb On

Falling

Rock ... Rock

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# Communications Technology

Name \_\_\_\_\_

Do all of the following requirements (1-5)

- \_\_\_\_1. Identify 5 kinds of communication technology, list examples of devices in your home that use each kind and do the following:
- \_\_\_\_a. Explain the difference between wired and wireless communications devices.
  - \_\_\_\_b. Explain the difference between broadcast and private communications.
  - \_\_\_\_c. Explain how 911 dispatch service works and when is it used.
  - \_\_\_\_d. Explain the use of the emergency broadcast services such as National Weather Service Radio and the Emergency Alert Service.
- \_\_\_\_2. Using a chart and/or text list of the US Radio Frequency Allocation from the US Department of Commerce <http://www.ntia.doc.gov/>, and information on the electromagnetic spectrum from NASA <http://imagine.gsfc.nasa.gov/>, do the following:
- \_\_\_\_a. Define electromagnetic radiation, frequency, radio frequency (RF) and spectrum.
  - \_\_\_\_b. Draw your own spectrum chart showing at least the following frequencies:
    - human hearing (audio)
    - human eyesight (visible light)
    - alternating current (electric power for your home)
    - AM and FM commercial broadcast radio
    - citizens' band radio, television
    - public service (police and fire)
    - and a least one amateur radio band

- \_\_\_\_\_3. Make a drawing showing how cell phone systems work and do the following:
- \_\_\_\_\_a. Explain the principles behind cell phone communications.
  - \_\_\_\_\_b. Explain why they are called cell phones.
  - \_\_\_\_\_c. Describe cell phone coverage gaps.
  - \_\_\_\_\_d. Describe the functions of the cellular data networks including at least: texting, Internet access, location services, and other smart phone/mobile device apps.
  - \_\_\_\_\_e. Compare the traditional landline telephone system, cellular system, and Internet telephony.
- \_\_\_\_\_4. Encryption of electronic communication signals use coding techniques so that no one other than the intended recipient can decode the message.
- \_\_\_\_\_a. Read a book or several articles about the history and methods of encryption.
  - \_\_\_\_\_b. Show an example code including encoding and decoding key(s).
  - \_\_\_\_\_c. Demonstrate encoding and decoding messages with another person.
  - \_\_\_\_\_d. **Learn who the wartime “code talkers” were and how they used encrypted, or secret communication.**
- \_\_\_\_\_5. **Read a study guide for an amateur radio technician license (e.g. “Now You’re Talking” or the newer “Ham Radio License Manual” published by ARRL).**
- \_\_\_\_\_a. Learn about the FCC, ITU, radio licenses, call signs, basic safety precautions for working with radio gear, the phonetic alphabet, and how the phonetic alphabet helps to communicate more clearly.
  - \_\_\_\_\_b. Answer at least 2 questions from each question group in the study guide.

**Do three of the following optional requirements from any topic (6-22)**

### **Amateur Radio**

- \_\_\_\_\_6. Acquire an FCC amateur radio license by taking and passing the Technician Class License exam. After you receive your license, contact someone on amateur radio using your new call sign.

- \_\_\_\_7. Participate in an amateur radio field day and learn about the purpose of this event. Make at least 5 contacts over a radio with the help of an experienced radio operator.
- \_\_\_\_8. Attend the National Weather Service severe weather Storm Spotter training in your area. Explain how amateur radio operators help safety officials during severe weather conditions.
- \_\_\_\_9. Describe how amateur radio operators provide emergency communications when catastrophic disasters happen.

### Technology

- \_\_\_\_10. Learn about the history of communication technology by doing the following:
  - \_\_\_\_a. Make a timeline showing at least five types of communication technologies and the people who are credited with inventing them.
  - \_\_\_\_b. Read a biography of a communications and broadcasting pioneer such as Alexander Graham Bell, Samuel Morse, Guglielmo Marconi and Edward R. Murrow.
- \_\_\_\_11. Learn about Samuel Morse and the Morse code and do the following:
  - \_\_\_\_a. Explain when Morse code was developed and why it was used.
  - \_\_\_\_b. Explain how Morse code is still used today.
  - \_\_\_\_c. Make a simple telegraph and practice using it with a partner.
  - \_\_\_\_d. Use Morse code to send and decode a telegraph message.
- \_\_\_\_12. Build an AM crystal radio or some other type of radio receiver and:
  - \_\_\_\_a. Determine what factors affect the quality of your reception.
  - \_\_\_\_b. Experiment to find which techniques result in the best reception on your radio.
- \_\_\_\_13. Investigate the technologies that are used to send information over the Internet.
  - \_\_\_\_a. Make a diagram of how the Internet transfers messages.
  - \_\_\_\_b. Define packets, hubs, routers, switches, and IP addresses.
- \_\_\_\_14. Draw a diagram showing how communication satellites send messages around the world.

- \_\_\_\_15. Draw a diagram showing how GPS satellite signals allow a GPS navigation system to determine where you are in the world.
- \_\_\_\_16. Define the terms pixel, RGB color, and HDTV. Explain how video information is broadcast.
- \_\_\_\_17. Tour a radio or TV station, 911-dispatcher facility, telephone company, or a radio or broadcasting museum. Discuss what types of equipment you saw and how it was used. Draw a diagram of the basic communications technologies used and how they are connected.

### Media

- \_\_\_\_18. By yourself or with a buddy, create your own radio show of at least 5 minutes duration and present it to your family, unit or troop.
  - \_\_\_\_a. Use KTLU, WTLU or another set of meaningful call letters for your radio station. Note: Call letters start with K or W for stations west or east of the Mississippi River.
  - \_\_\_\_b. Identify your intended audience.
  - \_\_\_\_c. Write a program schedule or script for the show to possibly include news, sports, weather, interviews, music, sound effects, commercials, a short drama, and/or an in-depth report on a subject.
  - \_\_\_\_d. Practice speaking like a radio announcer in a loud clear voice.
- \_\_\_\_19. By yourself or with a buddy, create a video of at least 5 minutes duration and present it to your family, unit or troop.
  - \_\_\_\_a. Develop a show concept such as an informational or entertaining show with a clearly defined purpose and message to communicate. Possible concepts include a video about Trail Life USA to present at your church or a Troop recruiting night, a video letter to encourage someone overseas, or an informational video to share with a younger unit.
  - \_\_\_\_b. Write a script for the show.
  - \_\_\_\_c. Make the video using a video camera and video editing software.

- \_\_\_\_20. Research how communications technology is helpful to missionaries in remote areas. Read a biography of a missionary in a remote area and explain how communications technology helped them.

### Leadership/Careers

- \_\_\_\_21. Lead one of the following activities for a younger unit:
- \_\_\_\_a. Teach the rules and etiquette that should be followed when using communication technology such as Instant Messenger or text messaging including: when it is and is not appropriate to use such technology, why it is important to follow family rules for these items, and what to do if someone is bullying or doing other inappropriate things while using this technology. Have them role-play communications following the rules and etiquette.
  - \_\_\_\_b. Teach to a younger unit several age appropriate secret codes and then have them split into pairs to exchange encoded messages with each other.
  - \_\_\_\_c. Lead a younger unit in the telephone game. Then lead a discussion with them on how technology has helped messages to be transmitted more quickly and more accurately.
  - \_\_\_\_d. Lead a younger unit in making tin-can phones. Have them test and tell what happens to the phone if the string is loose or is touching something else. Explain to them how a real telephone works and how it is different from a tin can phone.
  - \_\_\_\_e. Explain the rules for operating a citizen band (CB) radio and why are there rules for using the airwaves. Lead the younger unit in communicating via walkie-talkies or other two-way radios while following the rules.
- \_\_\_\_22. Research careers in the development or use of communication technology. Choose one career and interview or shadow for part of a day someone in that career. List the education and skills required to work in this field.

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# Competitive Rock Climbing

Name \_\_\_\_\_

Do all of the following requirements (1-5)

- \_\_\_\_\_1. Do the following to learn about competitive rock climbing in a rock gym setting:
  - \_\_\_\_\_a. List the safety and courtesy rules at your rock gym.
  - \_\_\_\_\_b. Explain the proper clothing and required safety equipment for bouldering and sport climbing in a rock gym.
  - \_\_\_\_\_c. Explain the strategy, scoring, and rules for bouldering competitions.
  - \_\_\_\_\_d. Explain the strategy, scoring, and rules for sport and speed climbing competitions.
  - \_\_\_\_\_e. Explain or demonstrate recovering from a fall.
  - \_\_\_\_\_f. Attend or watch a rock climbing competition.
- \_\_\_\_\_2. Become an approved or certified belayer at your rock gym.
- \_\_\_\_\_3. Demonstrate basic skills for your level by doing one of the following:
  - \_\_\_\_\_a. Climb a rock-wall top-rope route rated at 5.9 or higher on the Yosemite Decimal System (YDS)
  - \_\_\_\_\_b. Climb a rock-wall bouldering route rated VO or higher on the Hueco V-scale.
  - \_\_\_\_\_c. Successfully try out for a competitive team.
- \_\_\_\_\_4. Over a period of at least six weeks, participate in at least eighteen practice sessions on different days where a session can be any of the following:
  - \_\_\_\_\_a. Team practice
  - \_\_\_\_\_b. A professionally coached climbing skills session, lesson, or class
  - \_\_\_\_\_c. Individual rock climbing skills practice of at least one hour in duration at a rock climbing gym
- \_\_\_\_\_5. Participate in at least two rock climbing competitions of either type listed below:
  - \_\_\_\_\_a. Organized and run by a local rock climbing gym
  - \_\_\_\_\_b. Sanctioned by USA Climbing (Local, Regional, Divisional, or National)



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# Competitive Swimming

Name \_\_\_\_\_

- \_\_\_\_1. Do the following to learn about competitive swimming:
  - \_\_\_\_a. List at least five safety rules to follow while on the pool deck and while you are swimming.
  - \_\_\_\_b. Explain the etiquette rules for lap swimming.
  - \_\_\_\_c. Explain the importance of warming up and stretching before you swim and cooling down and stretching after you swim.
  - \_\_\_\_d. Explain the rules for each of the four racing strokes (butterfly, backstroke, breaststroke, and freestyle), relays, and the individual medley (IM) including the rules for legal starts, turns, and finishes.
  - \_\_\_\_e. Explain the process for a disqualification during a race.
  - \_\_\_\_f. Describe how events, heats, and lanes are determined based on seeding for timed finals and for preliminary heats.
  - \_\_\_\_g. List the dimensions of an Olympic-sized pool and other lengths that are used in competitive swimming.
  - \_\_\_\_h. Explain the purpose of lane lines, starting blocks, backstroke flags, and the touchpad.
- \_\_\_\_2. Do one of the following:
  - \_\_\_\_a. Explain how competitive swimsuits, goggles and other swim equipment have changed over the years to help athletes improve their time and technique.
  - \_\_\_\_b. Attend or watch a high school or college swim meet.
  - \_\_\_\_c. Attend or watch an international swimming competition.
  - \_\_\_\_d. Read a biography of a famous swimmer.
- \_\_\_\_3. Demonstrate the proper technique for each of the following:



- \_\_\_\_\_a. Racing starts: forward, backstroke, and relay.
- \_\_\_\_\_b. Racing turns for butterfly, backstroke, breaststroke, and freestyle.
- \_\_\_\_\_c. Swimming 50 meters (or 50 yards) of each of the four racing strokes (butterfly, backstroke, breaststroke, and freestyle).
- \_\_\_\_\_4. Over a period of at least six weeks, participate in at least eighteen practice sessions on different days where a session can be any of the following:
  - Team practice for an organized team
  - A professionally coached skills session, lesson, or class
  - Individual swim practice of at least 1800 yards
- \_\_\_\_\_5. Participate in at least four organized swim meets or competitions and swim in at least two different events in each.

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# Computing

Name \_\_\_\_\_

Do all of the following requirements (1-4)

- \_\_\_\_1. Explain what the following terms mean or what they tell you about your computer:
  - \_\_\_\_a. Storage: ROM, RAM, flash drive, hard drive
  - \_\_\_\_b. Processor: cores, speed, cache
  - \_\_\_\_c. Units: Gigahertz (GHz), Megahertz (MHz), Terabyte (TB), Gigabyte (GB), Megabyte (MB)
  - \_\_\_\_d. Input/Output: keyboard, mouse, touch pad, liquid crystal display (LCD), touch screen, camera, speakers, headphones, microphones, universal serial bus (USB), Ethernet, Wi-Fi
  - \_\_\_\_e. Peripherals: printer, cloud storage, external hard drives, optical drives, USB thumb drives, scanners
- \_\_\_\_2. Explain your rules and safety guidelines for online computing and social media, and do the following:
  - \_\_\_\_a. Explain the types of malicious software (malware: e.g. virus, Trojan horse, worm, spyware) and how each is transmitted.
  - \_\_\_\_b. Explain how to prevent malware infections and what to do if your computing device has malware infecting it.
- \_\_\_\_3. Demonstrate loading a software application on your computing platform and:
  - \_\_\_\_a. Verify you have the legal right to load and use the software.
  - \_\_\_\_b. Demonstrate the use of the software.
  - \_\_\_\_c. Explain and demonstrate how music you purchase online can be transferred to your computer, mobile device, smart phone or portable media player.
  - \_\_\_\_d. Explain why it would be wrong to install and use an illegal copy of the software, music, or other media.



- \_\_\_\_\_4. Create a table comparing brands, features, compatibility and prices of a particular type of computing platform or printer such as a desktop, laptop, tablet, mobile device, laser printer, or inkjet printer.
- \_\_\_\_\_a. Include the following in your comparison table:
- For Computers: processor type and speed, RAM size and speed, hard or flash disk size and read/write speeds, communication methods, included features, software, and price
  - For printers: printer type, print speed, printer price, and cost of supplies.
- \_\_\_\_\_b. Explain your comparison chart and which computer or printer is the best value (not necessarily the cheapest).

**Do three of the following optional requirements (5-16)**

- \_\_\_\_\_5. Help conduct a demonstration of three or more age-appropriate, educational, and enjoyable computer games to younger boys in your Troop.
- \_\_\_\_\_6. Look at careers in the computer field and what they involve. Interview two people in the computer field to determine what they studied in college, how they prepared for their careers and what advice they might have for you.
- \_\_\_\_\_7. With others and under the supervision of a qualified adult, take a look inside a desktop computer. Look for the power supply, motherboard, processor and disk drives. Look at the back of the computer to see how the cables are connected and how you might figure out which cables connect where.
- \_\_\_\_\_8. Create a computer presentation that tells about your experiences in Trail Life USA and any other similar character development programs in which you participated. Include at least three of the following in the document:
- A list of trail badges you have already earned including transfer credit.
  - A table showing the years that you have been involved and the service projects and hours you completed
  - A scanned picture or digital picture of something you did on an outing or campout
  - A list of your favorite activities

- A table showing activities you did and what you learned while doing this activity

- \_\_\_\_9. Read two computer magazines to find out about new products, reviews of existing products and buying information.
- \_\_\_\_10. Demonstrate how to change inkjet or laser toner cartridges in your printer.
- \_\_\_\_11. Make a collection of digital pictures and/or digital video and produce a slide show/movie and show it at a meeting.
- \_\_\_\_12. Explain the importance of backing up your files, and demonstrate your back-up system and procedure.
- \_\_\_\_13. Write a simple software application for your computing platform.
  - \_\_\_\_a. Specify the software with a drawing of the user interface and a set of software requirements (what it will do).
  - \_\_\_\_b. Design the software with a block diagram or other software method with brief descriptions of each block or function.
  - \_\_\_\_c. Code the software with Java, C++ or another appropriate language.
  - \_\_\_\_d. Compile and install the software. Then demonstrate the software.
- \_\_\_\_14. Write a second more complex software application for your computing platform using steps a-d above.
- \_\_\_\_15. Think of an Internet domain name that you might like to register and do the following:
  - \_\_\_\_a. Check to see if it is available.
  - \_\_\_\_b. List the registration costs for one-year and five-year registration
  - \_\_\_\_c. List the cost of a hosting package for your domain name that includes email and webpage hosting.
- \_\_\_\_16. Select one of the following methods and explain how it allows advertisers to track your online browsing activities and identify you personally:
  - \_\_\_\_a. Cookies
  - \_\_\_\_b. Third party cookies
  - \_\_\_\_c. Browser fingerprinting

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## Creeds

*Our Christian faith is not just a faith of the 21<sup>st</sup> century. It is an ancient faith. It is a faith that connects followers of our Lord Jesus Christ over thousands of years. The Church is who she is because of those faithful saints of old. We stand on the shoulders of those that have gone before us.*

*Throughout history the church and the people of God have needed to concisely summarize their beliefs in the face of false beliefs. These summaries are known as creeds and have inspired, grounded, and educated generations of Christians. The creeds are truth statements of the Christian Faith.*

Name \_\_\_\_\_

Do all of the following requirements (1-4)

\_\_\_\_\_1. The word creed comes from the Latin “credo” which means ‘I believe.’ Complete the following two studies individually or in a group setting:

\_\_\_\_\_a. Participate in a word study of ‘believe’.

\_\_\_\_\_i. Read Romans 10:9; James 2:19; John 14:1; Genesis 15:1-6; Exodus 4:27-31; Jonah 3:5.

\_\_\_\_\_ii. Look up the definitions of believe, faith, and confess in an English dictionary. Look up pisteuo (believe) and homologeo (confess) in a Greek dictionary, and aman (believe) in a Hebrew dictionary.

\_\_\_\_\_iii. In your study answer the following questions:

1. What is belief?
2. What does it mean to believe?
3. What role does profession or confession of belief play in the Christian’s life?

\_\_\_\_\_b. Participate in a study of what the Bible says about itself.

\_\_\_\_\_i. Read Matthew 4:4; II Timothy 3:16; I Peter 1:22-25; II Peter 1:20-21

\_\_\_\_\_ii. In your study, answer the following questions:

1. What do these verses teach about the Bible?
2. How is a creed judged by the Bible?

\_\_\_\_\_2. Read the Apostles’ Creed and the Nicene Creed.

\_\_\_\_\_a. List the truth statements in the Apostles’ Creed.

\_\_\_\_\_b. List the truth statements of the Apostles’ Creed that are expanded in the Nicene Creed.

- \_\_\_\_\_c. List the truth statements in the Nicene Creed that are not in the Apostles' Creed.
- \_\_\_\_\_3. The creeds were written in response to heresy. Research and explain one of the heresies below.
  - \_\_\_\_\_a. Gnosticism
  - \_\_\_\_\_b. Sabellianism
  - \_\_\_\_\_c. Marcionism
  - \_\_\_\_\_d. Arianism
  - \_\_\_\_\_e. Docetism
  - \_\_\_\_\_f. Nestorianism
  - \_\_\_\_\_g. Apollinarianism
- \_\_\_\_\_4. Reflect upon the Apostles' and Nicene Creeds and do the following:
  - \_\_\_\_\_a. Explain how they reflect the beliefs of all Christians.
  - \_\_\_\_\_b. Explain how the creeds confront problems the church has faced.

**Do four of the following optional requirements (5-22)**

- \_\_\_\_\_5. Read the Trail Life USA Statements of Faith and Values. Discuss the Statements of Faith and Values with your mentor including explaining how those statements:
  - \_\_\_\_\_a. Affect Trail Life USA
  - \_\_\_\_\_b. Guide your troop
  - \_\_\_\_\_c. Make Trail Life USA unique among male youth character development organizations
  - \_\_\_\_\_d. Change you and your behavior
- \_\_\_\_\_6. Research the Trinity by doing the following and then explain the Trinity to your mentor.
  - \_\_\_\_\_a. Look up the definition of the Trinity.
  - \_\_\_\_\_b. Find a picture of the *Shield of the Trinity* and determine what relations are represented.
  - \_\_\_\_\_c. Read Deuteronomy 6:4; Isaiah 44:6; Genesis 1:26; Matthew 3:16-17; John 1:1-5,17; Matthew 28:19; 2 Corinthians 13:14; and 1 Thessalonians 1:2-5.
- \_\_\_\_\_7. Create a poster or presentation of the Attributes of God using at least the following readings:
  - \_\_\_\_\_a. Read Psalm 90:2; 1 Kings 8:27; Rev 1:8; John 4:24; 1 Peter 1:16; Psalm 99:9; Psalm 145:17; John 4:8; Ephesians 2:4; Isaiah 55:8-9; Acts 17:27-28.

- \_\_\_\_\_ 8. Read Psalm 90:2; 1 Kings 8:27; Rev 1:8; John 4:24; 1 Peter 1:16; Psalm 99:9; Psalm 145:17; John 4:8; Ephesians 2:4; Isaiah 55:8-9; and Acts 17:27-28. Look up the definition of *Christology*, and create a poster or presentation on the person and nature of Jesus Christ that includes the truth statements about Christ from the Nicene Creed.
- \_\_\_\_\_ 9. Create a poster or presentation of the Life of Christ including the events cited in the Nicene Creed and other key events from the life of Christ described in the Gospel accounts.
- \_\_\_\_\_ 10. Create a poster or presentation about the Holy Spirit using at least the following readings:
- \_\_\_\_\_ a. Read Galatians 5:22–23; Isaiah 11:1-2; and Romans 12:6-8.
- \_\_\_\_\_ 11. Read 2 Corinthians 3:17; John 6:63; John 14:16-17; John 4:24; 2 Peter 1:21; 1 Corinthians 12:12-13; Acts 1:8; and Romans 8:11. A key term in the Nicene Creed is the Greek word *homoousios*, which is translated as *consubstantial* or *of the same substance*. Research this term and report your findings.
- \_\_\_\_\_ 12. Read the Chalcedon definition. List the truth statements of the Chalcedon definition that are not explicitly stated in the Nicene Creed.
- \_\_\_\_\_ 13. Read the Athanasian Creed. List the truth statements of the Athanasian Creed that are not explicitly stated in the Nicene Creed.
- \_\_\_\_\_ 14. Research one of the following early church figures. Present a three-minute oral biography of him and explain how he contributed to the writing of the Creeds.
- \_\_\_\_\_ a. Constantine
- \_\_\_\_\_ b. Athanasius
- \_\_\_\_\_ c. Eusebius of Caesarea
- \_\_\_\_\_ d. Cyril of Alexandria
- \_\_\_\_\_ 15. Repeat requirement 14 with a different person.
- \_\_\_\_\_ 16. Repeat requirement 3 with a different heresy.
- \_\_\_\_\_ 17. Find a song based on one of the creeds and sing it in a worship service at your church, chapel, or campout.
- \_\_\_\_\_ 18. Memorize and recite the Apostle’s Creed.
- \_\_\_\_\_ 19. Memorize and recite the Nicene Creed.
- \_\_\_\_\_ 20. If your church has a statement of faith, compare it to the creeds and describe what is different.

- \_\_\_\_\_ 21. Create a Responsive Reading either from the Apostle's Creed, Nicene Creed, or other creedal document approved by your Pastor. Lead the recitation of your Responsive Reading during a worship service at your church, chapel, or campout.
- \_\_\_\_\_ 22. Describe how three other churches or denominations use the creeds.

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## Driving Safety

Name \_\_\_\_\_

Automobiles are an important part of life today. For most people they are simply a way to get from one place to another; however, there are many safety challenges that make driving a serious endeavor. In order to decrease the chances of becoming involved in a collision there are several areas of concern you should understand:

- The rules of the road that provide a uniform approach to driving in all fifty states
- Common factors that contribute to collisions
- Special concerns of youthful drivers
- Onboard safety equipment

Do all of the following requirements in each of the four topics (1-10)

### Rules of the Road

- \_\_\_\_1. Obtain a copy of the new driver manual for your state and describe the content of each major section or chapter. Find five rules that drivers must obey when driving and explain why they're important to safety. Note: state driver manuals are often available online or for free at the local department of motor vehicles office.
- \_\_\_\_2. Explain how color and shape are used to promote consistency in the design of traffic signs and control devices. Similarly, road markings use a consistent theme throughout the USA to keep drivers moving in the correct direction and lane. Provide a description of the most common road markings in your area and what they indicate to drivers.
- \_\_\_\_3. Describe a turn lane and explain how a right or left turn lane differs from the turn lane in the center of the road. Then explain each of the following:



- \_\_\_\_\_a. Conditions under which you have the right of way when turning or at an intersection
  - \_\_\_\_\_b. Conditions under which you may pass another vehicle
  - \_\_\_\_\_c. Conditions under which you may not pass
  - \_\_\_\_\_d. Conditions under which you should use your emergency brake
- \_\_\_\_\_4. Explain the meaning and who has the right of way for the following traffic signals:
- \_\_\_\_\_a. Red light
  - \_\_\_\_\_b. Yellow light
  - \_\_\_\_\_c. Green light
  - \_\_\_\_\_d. Flashing yellow light
  - \_\_\_\_\_e. Flashing red light
  - \_\_\_\_\_f. Green arrow mean and how it differs from a green light

### **Common factors that contribute to collisions**

- \_\_\_\_\_5. **Drowsy Driving:** According to the National Sleep Foundation's Sleep in America poll, 60% of Americans have driven while feeling sleepy and 37% admit to actually having fallen asleep at the wheel in the past year. However, many people cannot tell if or when they are about to fall asleep.
- \_\_\_\_\_a. Research and identify signs that a driver is drowsy and should stop and rest.
  - \_\_\_\_\_b. Identify factors that contribute to drowsiness.
  - \_\_\_\_\_c. Identify ways to prevent and deal with drowsiness.
- \_\_\_\_\_6. **Distracted Driving:** There are three types of distraction – physical (taking hands off of the wheel), cognitive (taking your mind/attention off of the road), and visual (looking away from the road).
- \_\_\_\_\_a. List five common distractions, explain how driver distractions contribute to traffic accidents, and describe how drivers can minimize distractions.

- \_\_\_\_\_b. Describe the laws of your home state regarding: texting while driving, talking hands-free while driving, using a hand held phone while driving.

\_\_\_\_\_7. **Impaired Driving: Almost 30% of each year's traffic fatalities are related to drunk or drugged driving.**

- \_\_\_\_\_a. Describe how alcohol and other drugs affect the human body and why a person should never drink and drive, or drive while under the influence of any mind-altering substances including prescription drugs, cold medications, and illicit drugs.
- \_\_\_\_\_b. **Explain your state's laws on drunk driving and the consequences for driving while intoxicated or driving under the influence including penalties for younger drivers if they are different.**
- \_\_\_\_\_c. Describe the open-container law for your state.

### **Special concerns of youthful drivers**

\_\_\_\_\_8. Describe the top ten mistakes new drivers/teen drivers frequently make. Discuss ways to prevent making those mistakes as a youthful or inexperienced driver.

### **Onboard safety equipment**

- \_\_\_\_\_9. Demonstrate how to properly wear a lap or shoulder belt. Explain why it is important for drivers and passengers to wear safety belts at all times.
- \_\_\_\_\_10. List five safety features found in motor vehicles besides occupant restraint systems. Describe each safety feature, how each works, and how each contributes to safety.

### **Do one of the following optional requirements (11-16)**

- \_\_\_\_\_11. Explain the safety responsibilities of drivers and those that ride as passengers including: seat belts, car seat regulations, age requirements of the driver, noise and distractions, and safe operation of the car.
- \_\_\_\_\_12. Riding safely in a vehicle is important for all ages. Small children depend on their elders to keep them safe.

- \_\_\_\_\_a. Explain the safety regulations for car seats and booster seats in your state.
- \_\_\_\_\_b. Demonstrate the correct way to install a five-point child safety seat and buckle a doll, infant, or toddler into the child seat properly.
- \_\_\_\_\_13. With your parent's permission enroll in, and complete, a driver's safety course.
- \_\_\_\_\_14. List at least five ways your family could use its vehicles to help others. With a parent's help, put one of your ideas into action and report on the results and any safety issues.
- \_\_\_\_\_15. Interview a traffic law enforcement officer in your community to identify what three traffic safety problems the officer is most concerned about. Discuss possible ways to solve one of those problems.
- \_\_\_\_\_16. Accompanied by an adult and a buddy, pick a safe place to observe traffic at a controlled intersection (traffic signal or stop sign). Then do the following:
  - \_\_\_\_\_a. Observe traffic on three separate days and at three different times of the day, for 30 minutes on each visit.
  - \_\_\_\_\_b. Record the total number of vehicles observed so that you can determine the percentage of compliance vs. violations.
  - \_\_\_\_\_c. At this intersection, count the number of drivers not wearing a seat belt. Record if the driver was young or old, male or female.
  - \_\_\_\_\_d. At this intersection, count the number of failure to stop at red light or stop sign violations. Record if the driver was young or old, male or female.
  - \_\_\_\_\_e. Discuss your findings with your Mentor.

### Online Resources

<http://www.nhtsa.gov/>

<http://www.cdc.gov/motorvehiclesafety/index.html>

<http://www.iihs.org/iihs/topics>



<https://www.aaafoundation.org/>

<http://www.distracted.gov/>

<http://teendriving.aaa.com/DE/system/files/18/file/10DeadlyTeenDriverMistakesTipCard.pdf>

<http://drowsydriving.org/>

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# Electrical Engineering

Name \_\_\_\_\_

## Do requirement 1

- \_\_\_\_1. Explain the conventional and electron flow theories for current. Explain how Ohm's law is used to solve for each V, I, and R. Ohm's law is , where V is voltage in volts (V); I is current in amps (A); and R is resistance in ohms ( $\Omega$ )

## Do eight requirements (2-31) with at least two each from the first three topics

(Electricity and Magnetism, Energy Storage and Power Conversion, and Projects)

### Electricity and Magnetism (Do at least two)

- \_\_\_\_2. Explain the differences in series and parallel circuits and do the following:
- \_\_\_\_a. Draw circuit diagrams showing the difference between series and parallel circuits.
  - \_\_\_\_b. Build the circuits using low voltage direct current (DC).
  - \_\_\_\_c. Measure DC voltage, current and resistance of the two DC circuits using a multimeter.
  - \_\_\_\_d. Under appropriate adult supervision, safely measure wall outlet voltage (rms VAC).
- \_\_\_\_3. Construct an electromagnet and do the following:
- \_\_\_\_a. Test how many paper clips or washers you can pick up with different configurations constructed by varying:
    - Number of turns or length of coil
    - Battery voltage or batteries in series to increase DC voltage across the coil
    - Battery size, type, or batteries in parallel to increase the DC current in the coil
  - \_\_\_\_b. Explain the results of your tests.



- \_\_\_\_\_c. List ways you could improve your device.
- \_\_\_\_\_4. Speakers are electromagnetic devices. Under appropriate adult supervision, hook up speakers to a home stereo system and explain the following:
- \_\_\_\_\_a. Why there are two wires for each speaker and why is one marked or shaped differently.
- \_\_\_\_\_b. Changes to the speaker operation when the wires are reversed.
- \_\_\_\_\_5. Lead a younger patrol in the following static electricity experiment:
- \_\_\_\_\_a. Inflate several balloons.
- \_\_\_\_\_b. Rub one of the balloons on your hair and then slowly pull it away from your head.
- \_\_\_\_\_c. Have someone else observe what happens. Explain what is happening.

### **Energy Storage and Power Conversion (Do at least two)**

- \_\_\_\_\_6. Learn the basic electro-chemical technologies behind the following batteries, their energy densities (Wh/kg) and other advantages and disadvantages they have when compared.
- Nickel-cadmium (NiCd)
  - Nickel-metal hydride (NiMH)
  - Lithium-ion (Li-ion)
  - Lithium polymer (LiPo)
- \_\_\_\_\_7. Under appropriate adult supervision, locate the battery under the hood of a vehicle and do the following:
- \_\_\_\_\_a. Identify the positive (+) and negative (-) terminals.
- \_\_\_\_\_b. Explain how the battery gets recharged while the engine is running.
- \_\_\_\_\_c. Explain how the vehicle continues to run if the battery is disconnected.
- \_\_\_\_\_8. A typical mobile device comes with a power brick for charging that is powered by household alternating current (AC). The simplest power brick is a transformer-based AC/DC converter made up of at least a transformer, a rectifier, and an output filter. Do the following:
- \_\_\_\_\_a. Describe the difference between AC and DC.

- \_\_\_\_\_b. Explain the three basic functions: transformer, rectifier, and output filter.
- \_\_\_\_\_c. Explain why the power brick gets warm during use.
- \_\_\_\_\_d. Copy the input and output specifications from the back or side of the power brick and compute the power loss of the brick.
- \_\_\_\_\_e. Using a multimeter under appropriate adult supervision, safely measure the DC output voltage (open circuit) of an inexpensive power brick. Explain why it is higher than the listed output voltage.
- \_\_\_\_\_9. Learn and explain to your unit how electric motors and generators work. Explain **how car alternator produces AC current and how it's converted to DC**. Explain this by drawing an AC current wave and an AC rectified DC waveform.
- \_\_\_\_\_10. List the most common methods we use to generate electricity. Describe what natural resources and mechanisms are used and the advantages and disadvantages of each. List several new technologies that are being used compared to 100 years ago.
- \_\_\_\_\_11. Lead a younger patrol in the following activities:
  - \_\_\_\_\_a. Replace **batteries in a device using the "+" and "-" symbols to position the battery**.
  - \_\_\_\_\_b. Discuss the common battery sizes (AA, AAA, 9V, C, D) shapes and names. Give examples of where you might use each type and how to safely store them.

### Projects (Do at least two)

- \_\_\_\_\_12. Build a circuit containing a battery made from a lemon or potato. List ways you could improve your device.
- \_\_\_\_\_13. Build a solar powered circuit from scratch or a kit from a hobby store. Experiment with different light sources and document your experimental results.
- \_\_\_\_\_14. Build a wind-powered circuit from scratch or a kit from a hobby store. Experiment with different wind speeds and document your experimental results.
- \_\_\_\_\_15. Describe a breadboard and a printed circuit board (PCB). Then do the following:
  - \_\_\_\_\_a. Explain the uses of each and which requires soldering.

- \_\_\_\_\_b. Explain the different types of soldering tools, solder, the use of solder flux, and proper temperature control.
- \_\_\_\_\_c. Demonstrate how to correctly solder an electrical solder joint and solder a circuit element onto a PCB.
- \_\_\_\_\_16. Identify the electronic symbols for battery, switch, ground, resistor, capacitor, inductor, diode, light-emitting diode (LED), transistor, and integrated circuit. Then do the following:
  - \_\_\_\_\_a. Use the resistor color code to determine the resistance of three resistors.
  - \_\_\_\_\_b. Using a multimeter, measure the resistance value of those three resistors and compare your measured results to the coded value.
  - \_\_\_\_\_c. Draw a schematic of a simple electronic circuit that includes a battery, switch, LED, dynamic element (capacitor or inductor), and a nonlinear element (diode or transistor).
  - \_\_\_\_\_d. Describe the flow of electricity with the switch on and off.
  - \_\_\_\_\_e. Build your circuit and explain the results.
- \_\_\_\_\_17. With a breadboard and logic chips, design and build a half-adder or digital counter.
- \_\_\_\_\_18. Using a kit from a hobby store or equivalent, build a working control or timer circuit.
- \_\_\_\_\_19. Using a kit from a hobby store or equivalent, build a working audio amplifier.
- \_\_\_\_\_20. Using an Arduino microcontroller, make an electronics project of your choice that is approved by your Mentor.
- \_\_\_\_\_21. Make an electronics project of your choice that is approved by your Mentor.

### History

- \_\_\_\_\_22. Create and give a small presentation to your patrol discussing Benjamin Franklin and Thomas Edison and their contributions to electricity.
- \_\_\_\_\_23. **Learn about the “war of currents”** between George Westinghouse, Nikola Tesla and Thomas Edison and explain the following:
  - \_\_\_\_\_a. The different powers systems and the pros and cons of each
  - \_\_\_\_\_b. The purpose and use of rectifiers during this time

- \_\_\_\_\_24. Read about Michael Faraday and his contributions to electromagnetism and do the following:
- \_\_\_\_\_a. Build a simple homopolar motor and explain how it works and draw a diagram showing the magnetic fields to your patrol or unit.
  - \_\_\_\_\_b. Explain how a Faraday cage works and how a microwave uses this technology.
- \_\_\_\_\_25. Research two famous engineers in electrical or electronics engineering and report what engineering degrees these engineers earned, their major accomplishments, and what organizations they led or for which they performed significant engineering.
- \_\_\_\_\_26. Create and present a video or presentation to your troop, unit, or other group about the first light bulb including the history, technical challenges, and impact to life.
- \_\_\_\_\_27. Create and present a video or presentation to your troop, unit, or other group about the first telephone including the history, technical challenges, and impact to life.

### **Professional Activities**

- \_\_\_\_\_28. With a parent, attend a meeting of a local professional engineering society related to electrical or electronics engineering. List any scholarships or special opportunities for youth and young engineers that the Society may sponsor.
- \_\_\_\_\_29. Modern electrical or electronics engineering specialties include agricultural, aerospace, biomedical, computer, control systems, electrical, electronics, industrial, materials, nuclear, power systems, software, and systems engineering. Choose two specialties you have not used for another Science and Technology Trail Badge and do the following:
- \_\_\_\_\_a. Describe what type of work is done in those two engineering specialties and how the work of those two specialties is related.
  - \_\_\_\_\_b. Choose one specialty, and explain the education, training, and experience required to serve successfully in that profession.
- \_\_\_\_\_30. Note: This requirement is listed in multiple Trail Badges, but may only be used for one Trail Badge. Explain what it means to be an Engineer Intern and a Licensed Professional Engineer. List the requirements to become a Licensed Professional Engineer in your state.

\_\_\_\_\_31. Note: This requirement is listed in multiple Trail Badges, but may only be used for one Trail Badge. Read the Code of Ethics or Professional Conduct for Professional Engineers for your state (or NSPE Code of Ethics for Engineers if your state does not have one). One role of the engineer is providing society with accurate facts in order to make the best possible decisions.

\_\_\_\_\_a. Explain how the code you read relates to the Trailman Oath and good stewardship.

\_\_\_\_\_b. List possible consequences to the public if an engineer does not follow this Code.

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Date

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# Electricity

Name \_\_\_\_\_

*Electricity is a useful and efficient means of instantaneous delivery of power to our homes. It also is dangerous and can cause death if you become part of the electrical circuit. Our electrical system uses alternating current (AC) for transmission and distribution except for a few specialized long distance transmission wires using direct current (DC) at very high voltages for efficiency. Electricity is delivered to our homes typically through a three-wire arrangement that provides 120-volt alternating current (VAC) service and 240 VAC service.*

*Near the electrical service entry point to the house, there is a power meter and a circuit breaker box. The power meter measures our consumption of electricity usually expressed in units of kilowatt-hours (kWh). One kWh is consumed when you use a thousand watts of electricity continuously for one hour. The circuit breaker (fuse) box allows us to disconnect parts or the entire house from electricity service.*

*Many of our electronic devices are powered by direct current (DC) service. Our electrical system is designed to provide AC service at higher voltages. Electronic devices then contain transformers to step down the voltage and rectifiers to convert from AC to DC.*

Do all of the following requirements (1-5)

- \_\_\_\_\_1. List the hazards of working with electricity and then do the following:
  - \_\_\_\_\_a. List safety rules for working with electricity.
  - \_\_\_\_\_b. Explain circuit overloading and how to avoid it.
  - \_\_\_\_\_c. Explain the term watt (W), why light bulbs have different wattage ratings, and why lamps and light fixtures limit the wattage of light bulbs to be used.
  - \_\_\_\_\_d. Demonstrate safe rescue of a person being electrocuted by contact with a downed power line or broken appliance.
  - \_\_\_\_\_e. Explain steps to take in response to an electrical fire.
- \_\_\_\_\_2. Describe where lightning comes from and the dangers it poses to people.



- \_\_\_\_\_a. List safety measures to take when lightning is present.
- \_\_\_\_\_b. Explain how a surge suppressor and an uninterruptible power supply (UPS) protect electronics from lightning and other storm related power surges and outages.
- \_\_\_\_\_3. Explain how electricity is transferred to your home and what types are available. Under appropriate adult supervision, do the following:
  - \_\_\_\_\_a. Find the location of your home or meeting place power meter
  - \_\_\_\_\_b. Read the power meter twice about a month apart and compute the power usage (kWh).
  - \_\_\_\_\_c. Find the location of your home or meeting place circuit breaker (fuse) box.
  - \_\_\_\_\_d. Explain the purpose of circuit breakers (fuses).
  - \_\_\_\_\_e. Demonstrate how to shut off power and reset a breaker (or replace a fuse).
  - \_\_\_\_\_f. Describe the function, testing, and resetting of a Ground Fault Interrupter (GFI) receptacle.
  - \_\_\_\_\_g. Draw a circuit breaker (fuse) map of your house or meeting place.
  - \_\_\_\_\_h. Explain color-coding of residential wiring.
- \_\_\_\_\_4. Explain the differences between incandescent, fluorescent and LED lighting, and compare the following about each:
  - Cost factors: price, energy consumption, and lamp life
  - Technology factors: available color temperatures (Kelvin), conversions required to use home 120 Volt AC power, and disposal concerns
- \_\_\_\_\_5. Do three of the following projects under appropriate adult supervision:
  - \_\_\_\_\_a. Rewire a table lamp including proper tying off of the cord using the underwriters knot.
  - \_\_\_\_\_b. Build a rheostat and demonstrate it using flashlight batteries and a flashlight bulb or doorbell.

- \_\_\_\_\_c. Using proper wire color-coding, build models of a house circuit for a light switch and a switch loop using a switch, colored wires, flashlight batteries and a bulb or buzzer.
- \_\_\_\_\_d. Using proper wire color-coding, build a model of a house circuit for a three-way switch using two switches, colored wires, flashlight batteries and a bulb or buzzer.
- \_\_\_\_\_e. Using proper wire color-coding, build a model of a house circuit for a split circuit receptacle (half always on and half switched) using a switch, receptacle, colored wires, flashlight batteries and a bulb or buzzer.

**Do two of the following requirements (6-10)**

- \_\_\_\_\_6. We use electricity in our homes and schools and jobs every day. Make a list of ways you can save electricity at home or school. Implement at least two methods at home.
- \_\_\_\_\_7. Make a list of five electric appliances or devices in your home. Look at the labels, and determine how much energy each will use in a typical day. With your parents' permission, look at your electrical bill and determine the cost of using these appliances for a period of one month.
- \_\_\_\_\_8. List different power types available in other countries. Explain why many devices can use both U.S. and European power with just an outlet adapter.
- \_\_\_\_\_9. Lead a younger patrol in making a list of things that use electricity that you use every day and discussing how your day would change without electricity
- \_\_\_\_\_10. Make a list of careers that involve electricity. Interview two people with careers from this list. Discuss their day-to-day works and what training or education was required for their job. Present what you learned to your unit.

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# Engineering Mechanics

Name \_\_\_\_\_

Do nine of the following requirements from any topic (1-19)

## Engineering Mechanics

- \_\_\_\_1. Many engineers use a computer-aided design (CAD) system to help them design their products. Research a CAD software tool (e.g. SolidWorks, CATiA, AutoCAD) and watch an introductory online tutorial for the CAD system chosen. List five types of products designed with it.
- \_\_\_\_2. Using common materials or a kit, make a catapult or trebuchet. Under adult supervision, demonstrate its use at a Troop or Unit meeting. Explain how potential energy is transformed into kinetic energy and motion.
- \_\_\_\_3. Do the following to demonstrate shear force and moment:
  - \_\_\_\_a. Place a deck of cards on the table, and demonstrate shear force by pushing sideways across the top of the deck. Explain what happens to the cards in the deck.
  - \_\_\_\_b. Have someone hold the end of a stick at least four feet long level with the floor, and hang a weight on the stick six inches from his hand. Then, take the same weight and hang it at the very end. The twisting force that is felt by the person holding the stick is called a moment. Explain why the weight exerts a greater moment when it is hung at the end of the stick than next to the hand of the person holding it.
- \_\_\_\_4. Gears are used to provide an increasing mechanical advantage of increasing torque or a decreasing mechanical advantage of increasing speed. Gears may also be used to change the type or direction of motion. Describe the following gear arrangements and list applications where we might see them used.
  - \_\_\_\_a. Gear Train

- \_\_\_\_\_b. Worm Drive
  - \_\_\_\_\_c. Bevel Gears
  - \_\_\_\_\_d. Planetary Gears
  - \_\_\_\_\_e. Rack and Pinion
- \_\_\_\_\_5. Bicycle gears are called sprockets and are connected with chains. Mechanical advantage can be experienced on a multi-speed bicycle using derailleur gears where a lower mechanical advantage is harder to pedal, but results in a faster speed for a given pedal revolutions per minute (rpm). Most bicycle sprockets sets are designed for a reduction of mechanical advantage because we design them for increasing speed. The mechanical advantage is the number of front sprocket teeth divided by the number of rear sprocket teeth and represents the fraction of a revolution of the pedals needed to turn the back wheel one revolution.
- \_\_\_\_\_a. For each possible front and rear sprocket combination of a multi-gear bicycle, compute the following:
    - \_\_\_\_\_i. Mechanical advantage (ratio of front teeth to rear teeth)
    - \_\_\_\_\_ii. Bicycle speed at 60 rpm pedaling
    - \_\_\_\_\_iii. Bicycle speed at 80 rpm pedaling
  - \_\_\_\_\_b. Test your calculations by maintaining a specified pedaling rpm in one gearing configuration over a specified distance that is accurately timed (e.g. 5th gear at 60 rpm over 1 mile).
- \_\_\_\_\_6. Build and launch a model rocket and explain the following:
- \_\_\_\_\_a. Engine thrust
  - \_\_\_\_\_b. Engine impulse
  - \_\_\_\_\_c. Ejection charge delay
  - \_\_\_\_\_d. The key purpose of the rocket nozzle design

### Fluid Mechanics

- \_\_\_\_\_7. Water Pressure. Cut or Drill three holes ( $\frac{1}{4}$  inch in size) up and down the side of an empty milk carton; then cover them with a single piece of tape. Fill the carton with water. Predict which stream will be strongest when the tape is removed. Explain what you observe.

- \_\_\_\_\_8. An airplane wing has an aerodynamic shape called an airfoil. Do the following:
- \_\_\_\_\_a. Draw a picture of a typical wing cross-section and label the following parts on the airfoil:
- Leading Edge
  - Trailing Edge
  - Chord Line
- \_\_\_\_\_b. Draw a top view of a delta wing and label the following parts. Using your diagram, learn how to graphically find the Mean Aerodynamic Chord (MAC).
- Root Chord
  - Tip Chord
- \_\_\_\_\_c. Explain how airfoils can produce lift for aircraft flight.
- \_\_\_\_\_d. Explain the term angle of attack and stall as they relate to airfoils.
- \_\_\_\_\_9. Participate in a Floatable Moatable troop or unit competition –Using materials, such as a paper bowl, aluminum foil, straws, construction paper, plastic sandwich bags, and masking tape and time provided, construct a free-floating craft. Float the craft in a water-filled container. Without putting your hands over the craft or water surface, load as many marbles as possible into the craft in five minutes.

### Thermodynamics

- \_\_\_\_\_10. Plan and conduct an experiment to demonstrate the differences in heat conductivity between wood, metal and plastic.
- \_\_\_\_\_11. The first law of thermodynamics (law of conservation of energy) states that if we have a certain amount of energy, it can be converted into different types of energy **but energy can't be created or destroyed. Research the fire piston type fire starter** and do the following:
- \_\_\_\_\_a. Identify the kinetic energy (energy of an object in motion) and what other energy types are found when using a fire piston.
- \_\_\_\_\_b. Explain where the heat comes from.

- \_\_\_\_\_12. The second law of thermodynamics states that energy will naturally spread out or disperse unless something keeps it from doing so. Therefore it is not possible to raise the temperature of an object or liquid without doing work. Perform the following experiment:
- \_\_\_\_\_a. Fill a small pot half full with water and bring it to a boil.
  - \_\_\_\_\_b. Carefully drop several ice cubes into the boiling water being very careful not to splash boiling water on yourself or someone else.
  - \_\_\_\_\_c. Explain why all the water stops boiling and when it starts to boil again.
  - \_\_\_\_\_d. Explain where some of the heat from the boiling water was transferred.
- \_\_\_\_\_13. There are three basic ways heat is transferred: conduction, convection, and radiation. Research these three methods and do the following:
- \_\_\_\_\_a. Explain each method of heat transfer and give two examples of each method.
  - \_\_\_\_\_b. Explain why fiberglass used in our home construction is a good insulator.
  - \_\_\_\_\_c. Explain which heat transfer method fiberglass insulation reduces.
  - \_\_\_\_\_d. Explain how a convection oven works using convection heating.
  - \_\_\_\_\_e. Explain why color plays a role in sunlight radiation heat transfer.

### **History and Professional Activities**

- \_\_\_\_\_14. Create and present a video or presentation to your troop, unit, or other group about the first locomotive including the history, technical challenges, and impact to life.
- \_\_\_\_\_15. Research two famous engineers in mechanics and report what engineering degrees these engineers earned, their major accomplishments, and what organizations they led or for which they performed significant engineering.
- \_\_\_\_\_16. With a parent, attend a meeting of a local professional engineering society in your locality related to engineering mechanics. List any scholarships or special opportunities for youth and young engineers that the Society may sponsor.



- \_\_\_\_\_17. Modern engineering mechanics specialties include agricultural, architectural, aerospace, biomedical, ceramic, chemical, civil, construction, control systems, industrial, materials, mechanical, metallurgical, mining, naval architecture and marine, nuclear, petroleum, structural, systems, and transportation engineering. Choose two specialties you have not used for another Science and Technology Trail Badge and do the following:
- \_\_\_\_\_a. Describe what type of work is done in those two engineering specialties and how the work of those two specialties is related.
- \_\_\_\_\_b. Choose one specialty, and explain the education, training, and experience required to serve successfully in that profession.
- \_\_\_\_\_18. Note: This requirement is listed in multiple Trail Badges, but may only be used for one Trail Badge. Explain what it means to be an Engineer Intern and a Licensed Professional Engineer. List the requirements to become a Licensed Professional Engineer in your state.
- \_\_\_\_\_19. Note: This requirement is listed in multiple Trail Badges, but may only be used for one Trail Badge. Read the Code of Ethics or Professional Conduct for Professional Engineers for your state (or NSPE Code of Ethics for Engineers if your state does not have one). One role of the engineer is providing society with accurate facts in order to make the best possible decisions.
- \_\_\_\_\_a. Explain how the code you read relates to the Trailman Oath and good stewardship.
- \_\_\_\_\_b. List possible consequences to the public if an engineer does not follow this Code.

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# Engineering Structures

Name \_\_\_\_\_

Do eight of the following requirements from any topic (1-20)

## Structures

- \_\_\_\_1. Study regional differences in design and construction of facilities. Describe how an engineer might design a house differently for desert, tropical, and arctic climates.
- \_\_\_\_2. **With your parent's permission, look up LEED certification on the Internet. Describe** to your Leader the criteria (sustainable sites, water efficiency, energy and atmosphere, etc.) that are used to assign points to achieve LEED certification. Suggest three ways a facility can be designed to minimize energy usage. Describe why it is important that a project have a LEED goal from the outset.
- \_\_\_\_3. Sometimes when a building is being constructed, parts of the building that were drawn by designers of different disciplines are designed to be in the same place. For example, the ductwork to carry heating air may be shown on the drawings in the same place as the pipes for a fire protection system, creating a conflict on the construction site between installers of the two different systems.
  - \_\_\_\_a. Explain how do you think this sort of problem can be avoided.
  - \_\_\_\_b. **With your parents' permission, go the Internet and look up Building Information Management (BIM). Write a 100-word paper describing how this computer design tool can help engineers reduce or eliminate conflicts, and obtain feedback from a Licensed Professional Engineer.**
- \_\_\_\_4. Participate in a Bridge or Tower design, build and test competition in your area.
- \_\_\_\_5. Participate in a Troop, Unit or local Paper Bridge contest.
  - \_\_\_\_a. **Construct a Paper Bridge between two blocks 6" apart, using only an 8.5 X 11 sheet of paper or card stock, and two paper clips.**

- \_\_\_\_\_b. Load your bridge with pennies, washers, or small toy cars to determine how many your bridge can support.
- \_\_\_\_\_c. Compare your design with others in terms of load capacity and construction.
- \_\_\_\_\_6. Lead a younger unit or patrol in assembling a gumdrop dome and a simple gumdrop cube using gumdrops and toothpicks. Discuss which type of structure will hold the most weight. After allowing the assemblies to dry, test your theory using books as your weight.
- \_\_\_\_\_7. Lead a younger unit or patrol in Making Tunnels Meet. Place a large sheet of cardboard or poster board (at least two feet by two feet) vertically between two heavy books. Have two Trailmen, one on each side of the board, each draw three **3/8" circles on their side of the board, without their partner seeing them.** Then, the Trailmen describe to each other the exact location of their circles; their partner then marks where they think the circles on the other side of the board are located. When both are finished, with adult supervision, each Trailman punches or drills through the board. See how close you came!

### Historical Structures

- \_\_\_\_\_8. Create and present a video or presentation including images to your troop, unit, or other group about the designer and the purpose of one of the following engineering accomplishments, which supported a great work of art or architecture.
- Hagia Sophia (in Turkey)
  - The Sistene Chapel (In Italy)
  - Saint Peters Cathedral (Vatican)
  - Santa Maria Del Fiore cathedral (Florence)
  - The Taj Mahal
  - The theater at Epidaurus and its acoustic engineering
- \_\_\_\_\_9. Create and present a video or presentation about one of the following historic engineering accomplishments, and describe a technological barrier that was **overcome in its construction (see DVD series "Engineering an Empire", published by the History Channel).** Include pictures and/or diagrams as appropriate:
- Pyramids of Egypt

- Colosseum at Rome
- The Tunnel at Samos (Ancient Greece)
- The Parthenon (Ancient Greece)
- The Great Wall of China
- The Road system of the Incas (America)
- The Aquaducts (Ancient Rome)
- The Pantheon (Ancient Rome)
- Tomb of Agamemnon (Corbel Arch - Mycenae, Greece)

\_\_\_\_10. Not everything that is designed and built is a success. Research the Tacoma Narrows Bridge and what caused its collapse. Find and show a video to your patrol. Tell them about the bridge, when it was built and what caused it to collapse.

\_\_\_\_11. Understanding Nehemiah

\_\_\_\_a. Read Nehemiah, Chapters 1 and 2. Describe the condition of the city of Jerusalem, and the condition of the Israelites who lived there.

\_\_\_\_b. Read Nehemiah 8. Explain how the building of the wall and the construction of a platform facilitate the spiritual growth of the Jewish people, and the renewal of their culture.

\_\_\_\_c. Read Nehemiah 12: 27-40. Tell your Leader or parent about the joy of the worship experience the Hebrews felt as they celebrated the completion and dedication of the city wall of Jerusalem.

\_\_\_\_d. Read Nehemiah 12:44. Explain how the rebuilt facility supported storage of food supplies.

### Strength of Materials

\_\_\_\_12. Explain the meaning of tensile, compressive (or compression), and shear as these terms relate to forces and do the following:

\_\_\_\_a. Identify some materials that are used that are to resist tensile, compressive, and shear forces. Explain why some materials do not work well under certain loads.

- \_\_\_\_\_b. Be able to explain which of the following materials and forms are used to resist tensile, compressive, or shear loadings:
- Concrete slab
  - Steel cable
  - Tent guy line
  - Tent pole
- \_\_\_\_\_c. Use a sponge with lines drawn across it, and bend the sponge. Explain to your Unit Leader or parent what part of the sponge is in tension, and what part is in compression.
- \_\_\_\_\_13. The engineering term stress is used to describe the distributed internal forces used to react an applied load of a given material or structural member. Some materials have better stress properties than others making them stronger in resisting certain loads. Estimate the compressive stress by performing doing the below activity with a brick and a bathroom scale:
- \_\_\_\_\_a. Weigh yourself. This will be your applied force.
- \_\_\_\_\_b. Measure the length (l) and width (w) of the brick. The cross sectional area is (l \* w).
- \_\_\_\_\_c. Carefully balance on one foot on top of the brick.
- \_\_\_\_\_d. Compute the stress in pounds per square inch (psi) = Applied Force (pounds) / Area (square inches)
- \_\_\_\_\_e. Brick compressive strengths can range from 1,000 psi to 15,000 psi. Explain how close to crushing the brick you were.
- \_\_\_\_\_14. Using a raw egg, a hard-boiled egg, and several tablespoons of salt, lead a younger unit or patrol in the following experiments:
- \_\_\_\_\_a. Spin a raw and a hard-boiled egg on a table surface. Explain the different results and the term inertia.
- \_\_\_\_\_b. Squeeze a raw egg by gripping it with one hand making sure your fingers are completely wrapped around, applying even pressure towards the center of the egg. (Don't wear a ring while performing this experiment!)

- \_\_\_\_\_c. Using a thumb and forefinger, squeeze the top and bottom of the egg. Explain **why it's difficult to break such a fragile egg and the difference between even and uneven force distribution**. Explain if beaks break eggshells with an even force distribution or a concentrated force.
- \_\_\_\_\_d. Put an uncooked egg in a glass of water. Take note if it floats or sinks. Start adding salt. Explain to them why the change in the water density causes the egg to float.
- \_\_\_\_\_15. Lead a younger unit or patrol in demonstrating the following engineering principles using the materials listed:
  - \_\_\_\_\_a. Using a marshmallow, demonstrate compression by squeezing the marshmallow between your hands. Explain why an engineer would like to build a house on rock, rather than marshmallow or sand.
  - \_\_\_\_\_b. Using a licorice stick, demonstrate torsion by twisting the licorice stick; then demonstrate tension by pulling each end of the licorice sticks. Discuss how an engineer might use a steel cable in tension to hold up a bridge.
  - \_\_\_\_\_c. With a friend holding a pencil at each end, use your finger to put some weight in middle of the pencil. Do you think that if you moved your finger closer to the end of the pencil and then pushed down, your friend could tell? Try it! Do you think engineers can use math to determine how much weight each hand would feel?

### Professional Activities

- \_\_\_\_\_16. Research two famous engineers in civil or structural engineering and report what engineering degrees these engineers earned, their major accomplishments, and what organizations they led or for which they performed significant engineering.
- \_\_\_\_\_17. With a parent, attend a meeting of a local professional engineering society in your locality related to structures. List any scholarships or special opportunities for youth and young engineers that the Society may sponsor.
- \_\_\_\_\_18. Modern structural engineering specialties include architectural, aerospace, civil, construction, control systems, environmental, geotechnical, mechanical, mining, naval architecture and marine, structural, systems, and transportation engineering. Choose two specialties you have not used for another Science and Technology Trail Badge and do the following:

- \_\_\_\_\_a. Describe what type of work is done in those two engineering specialties and how the work of those two specialties is related.
- \_\_\_\_\_b. Choose one specialty, and explain the education, training, and experience required to serve successfully in that profession.
- \_\_\_\_\_19. Note: This requirement is listed in multiple Trail Badges, but may only be used for one Trail Badge. Explain what it means to be an Engineer Intern and a Licensed Professional Engineer. List the requirements to become a Licensed Professional Engineer in your state.
- \_\_\_\_\_20. Note: This requirement is listed in multiple Trail Badges, but may only be used for one Trail Badge. Read the Code of Ethics or Professional Conduct for Professional Engineers for your state (or NSPE Code of Ethics for Engineers if your state does not have one). One role of the engineer is providing society with accurate facts in order to make the best possible decisions.
- \_\_\_\_\_a. Explain how the code you read relates to the Trailman Oath and good stewardship.
- \_\_\_\_\_b. List possible consequences to the public if an engineer does not follow this Code.

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# Engineering Systems

Name \_\_\_\_\_

Do one requirement each from eight of the ten topics below (1-24)

## Industrial and Systems Engineering

Industrial engineering involves the development, and optimization of processes and systems. Originally it was focused on manufacturing industries but now includes any field that uses engineering methods to develop or improve systems or processes.

- \_\_\_\_1. **Research Henry Ford's development and use of the assembly line and do the following:**
  - \_\_\_\_a. Explain when and how the assembly line was used.
  - \_\_\_\_b. Compare a modern assembly line to Henry Ford's version and list some differences.
- \_\_\_\_2. Perform a trade-off study to compare at least three alternatives with consideration of initial cost, maintenance or annualized replacement cost, and at least three performance characteristics. Use a spreadsheet to assign weighting to each trade parameter and assign numeric values to at least three levels of performance (e.g. Good, OK, Bad). For example, you might perform a trade-off study of backpacking tents using performance characteristics: weight per person, stability in storms, and durability.

## System Design and Verification

- \_\_\_\_3. Develop a simple system that you could produce with your patrol, friends, or family by doing the following:
  - \_\_\_\_a. Specify at least three requirements for your system that you can verify by inspection or testing.
  - \_\_\_\_b. Design your system using parts or a kit that you customize in some way.
  - \_\_\_\_c. Build a prototype using the parts or kits specified in your design.

- \_\_\_\_\_d. Verify that your system meets the requirements you specified.
- \_\_\_\_\_4. With parental permission and under appropriate adult supervision, disassemble a battery-powered toy that converts electric power to movement. After explaining its design and function to your Mentor, ensure that all parts are still in place, replace and secure the cover, and operate the toy to ensure it works as it did before you removed the cover. Explain the following:
- \_\_\_\_\_a. How the electric motor uses energy to turn the gears to make the mechanism work
- \_\_\_\_\_b. How the gears are held in place, and how they are positioned to either transfer motion or change the mechanical advantage
- \_\_\_\_\_c. The material from which the gears are made
- \_\_\_\_\_d. The material trade-off between durability, cost, and ease of manufacturing

### **Engineering Economics**

- \_\_\_\_\_5. Determine the costs involved in making the system you designed in requirement 3. Use the purchase prices for the prototype parts or bulk prices if available. Include any fixed costs for tools or other one-time items, direct labor costs of paying your group to produce these systems, indirect labor costs for paying a manager, overhead costs of your building rent and utilities, employment taxes, and sales tax.
- \_\_\_\_\_6. Using a spreadsheet program, create a loan amortization table for a loan of \$100,000 paid monthly over a loan period of 5 years with an annual interest rate of 12% compounded monthly. The table should be indexed by month number and include for each month: beginning balance, payment, principal, interest, cumulative principal, cumulative interest, and ending balance. Above the table, should be the loan amount, annual interest rate, interest rate per period (month), and calculated payment.
- \_\_\_\_\_7. Research how to calculate a break-even point and what is meant by fixed and variable costs.

### **Information Management**

- \_\_\_\_\_8. Design and implement an inventory tracking database for parts and completed systems for your system design in requirement 3.

- \_\_\_\_\_9. Design and implement an inventory or checkout database system for Troop equipment or a Troop library using a spreadsheet, database, or TroopTrack. Make sure you have a simple means to uniquely identify each record and associate it to a unique item in the inventory.

### **Industrial Management**

- \_\_\_\_\_10. Draw an organization chart for a hierarchical organization such as your Troop, church, charter organization, etc. Explain the management structure and position responsibilities and propose a streamlined organization chart.
- \_\_\_\_\_11. Research the Theory X and Theory Y motivational theories and do the following:
- \_\_\_\_\_a. Explain each theory as an attitude management holds about employees.
  - \_\_\_\_\_b. Describe which better describes how your Troop is run.
  - \_\_\_\_\_c. Compare each theory with the Trailman oath.

### **Human Factors and Ergonomics**

The field of human factors and ergonomics integrates information from engineering, psychology, physiology, biomechanics, anthropometry, and industrial design into systems or products for human use.

- \_\_\_\_\_12. Evaluate or set-up a computer workstation to fit you based on ergonomic guidelines found in your computer manual, state or federal OSHA web sites, or other sources.
- \_\_\_\_\_13. Look at a chart containing a diagram of anthropometric data and do the following:
- \_\_\_\_\_a. List three things in your home that were designed using similar human data.
  - \_\_\_\_\_b. List three design aspects inside a vehicle that involve human factors.

### **Reliability**

One technique of improving system reliability is to create redundant parallel paths that must all fail for that function to fail. The space shuttle avionics computers were an example of this approach.

- \_\_\_\_\_14. Research how the five space shuttle computers were used to improve system reliability and:
- \_\_\_\_\_a. Explain how four were used redundantly to reduce the chance of an error.
  - \_\_\_\_\_b. Explain what the purpose of the fifth computer was.

- \_\_\_\_15. Simulate two and three parallel paths and compare the resultant number of failures in 20 trials. Have two people simulate one system and three the other. Each person will flip a coin to represent one trial. For the simulated two parallel paths, the system fails if both coins are tails for a trial. For the simulated three parallel paths, the system fails if all three coins are tails for a trial. Keep track of the number of failures and the number of trials. Explain your results to your Mentor.

### Simulation

Simulation is a technique of trying out aspects of a system before building it. Writing computer programs or using spreadsheet applications are two valid approaches. Simulations can also be done using objects and people such as the reliability simulation in requirement 15 using people flipping coins to simulate parallel path redundancy benefits in improving reliability.

- \_\_\_\_16. Devise a simulation to determine how to best answer the Monty Hall problem. On the old **Let's Make a Deal** game show, the host Monty Hall would show a person three doors. Behind one was a valuable prize. After selecting one door, Monty Hall would have one of the two remaining doors opened, which was always not the prize. Then he would offer to let the person switch their selection to the other unopened door. The question is whether it is better to stay with your initial selection, switch, **or it doesn't matter.**
- \_\_\_\_17. Devise a simulation to determine average waiting times for service at a fast food restaurant. Assume that processing each order takes an average of 1 minute. Vary the service times around the average using a uniform distribution (rand is a typical function name) and vary the arrivals around an average rate using a uniform distribution. Graph your results.

### Quality

- \_\_\_\_18. PICK stands for Possible-Implement-Challenge-Kill. It is a six-sigma tool for selecting courses of action. Research the PICK chart and use it to select outings and service projects for your Troop, Unit, or Patrol.
- \_\_\_\_19. The Cause and Effect (Fishbone) diagram is a six-sigma tool for finding the root cause of a problem. Research the diagram and use it to find the root cause of a problem in the implementation of a Troop, Unit, or Patrol activity.

### Professional Activities

- \_\_\_\_\_20. Research two famous engineers in systems engineering and report what engineering degrees these engineers earned, their major accomplishments, and what organizations they led or for which they performed significant engineering.
- \_\_\_\_\_21. With a parent, attend a meeting of a local professional engineering society in your locality related to systems engineering. List any scholarships or special opportunities for youth and young engineers that the Society may sponsor.
- \_\_\_\_\_22. Modern systems engineering specialties include aerospace, biomedical, chemical, computer, control systems, electrical, electronics, environmental, fire protection, industrial, mechanical, naval architecture and marine, nuclear, petroleum, power, software, systems, and transportation engineering. Choose two specialties you have not used for another Science and Technology Trail Badge and do the following:
- \_\_\_\_\_a. Describe what type of work is done in those two engineering specialties and how the work of those two specialties is related.
- \_\_\_\_\_b. Choose one specialty, and explain the education, training, and experience required to serve successfully in that profession.
- \_\_\_\_\_23. Note: This requirement is listed in multiple Trail Badges, but may only be used for one Trail Badge. Explain what it means to be an Engineer Intern and a Licensed Professional Engineer. List the requirements to become a Licensed Professional Engineer in your state.
- \_\_\_\_\_24. Note: This requirement is listed in multiple Trail Badges, but may only be used for one Trail Badge. Read the Code of Ethics or Professional Conduct for Professional Engineers for your state (or NSPE Code of Ethics for Engineers if your state does not have one). One role of the engineer is providing society with accurate facts in order to make the best possible decisions.
- \_\_\_\_\_a. Explain how the code you read relates to the Trailman Oath and good stewardship.
- \_\_\_\_\_b. List possible consequences to the public if an engineer does not follow this Code.

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# Environmental Stewardship

Name \_\_\_\_\_

*Mankind's continual growth and placement of man-made buildings, roads, and infrastructure serves to increase human life expectancy and quality of life. However, mankind's activities can also have detrimental impacts on the world environment by adding buildings and pavement, altering drainage patterns, drying up wetlands, and emitting pollution into the air and water. As part of the natural created environment, mankind has both the privilege and responsibility of stewardship over the environment and to care for humans, especially the least among us, because they are all made in the image of God. This Trail Badge introduces you to the activities of environmental stewardship including recycling, reuse, clean-up, and choosing wise practices.*

## Do all of the following requirements (1-5)

- \_\_\_\_1. Participate in your community-recycling program or collect at least three categories of recyclable waste for two weeks and deliver it to a recycling center. Then for the five categories of recyclable waste: Paper, Aluminum, Metals, Plastics, and Glass, make a chart showing:
  - \_\_\_\_a. The ways this waste product harms the environment when dumped in a landfill, dumped in the ocean, or incinerated
  - \_\_\_\_b. The ability to recycle this category of waste multiple times (i.e. can it be recycled forever or does the byproduct quality diminish?)
  - \_\_\_\_c. The demand for each category in the recycling marketplace.
- \_\_\_\_2. Keep a log of family purchases for two weeks – categorize each purchase (i.e. trip to food store) as **“Critical/Necessary”** or **“Non-Critical/Desired Items”**. Analyze the purchases and discuss with your family how having too much stuff impacts the family, community (waste production), and environment. Develop a plan to identify unused/undesired excess stuff in your home and then dispose of these items by repurposing, donating, selling, recycling, etc.
- \_\_\_\_3. List at least five different types of pollution and do the following:
  - \_\_\_\_a. Explain how each type of pollution affects animals and their habitats.
  - \_\_\_\_b. List actions you can do to limit the impact of each type of pollution.

- \_\_\_\_\_4. Organize a neighborhood clean up project, such as cleaning a riverbank, beach, park, etc.
- \_\_\_\_\_5. Research which of the following are better for our environment. Make a chart showing the positive and negative effects of each item or practice, or hold a debate about the positive and negative effects of the above items and practices. Some answers may surprise you.
- Carbon Footprint of Hybrid electric vehicles vs. regular vehicles
  - Total impact of disposable diapers vs. cloth diapers with a diaper service
  - Bulk packaging of food (quart/gallon or larger) vs. individual serving boxes/cans/bottles/etc.
  - High density apartment buildings with community parks/courts/pools vs. tracts of single family homes with individual backyards and play areas
  - Flexibility of individual cars versus the required infrastructure for mass transit

**Do three of the following optional requirements from any topic (6-13)**

- \_\_\_\_\_6. Make a chart showing the benefits and downsides to hybrid vehicles as compared to traditional vehicles. Include categories for purchase cost, availability, maintenance costs, fuel costs per mile, amount of pollution created, type of pollution created, cost to repair in the event of a crash, safety, disposal of retired vehicle.
- \_\_\_\_\_7. Pick an environmental issue and write a letter to your representative or senator to share your concerns and proposed solutions. Send the letter and see if you get a reply.
- \_\_\_\_\_8. Create a survey on how people in your community, Troop, or family care for the environment. Ask at least ten youth and ten adults to participate. Compile your findings and share your conclusions with the people you surveyed.
- \_\_\_\_\_9. Make a chart that shows whether recycling is available for each item and if so, how it is accomplished (where to go, who to call, etc.): Christmas trees, ink cartridges, computers, televisions, cell phones and rechargeable batteries. Organize a collection drive for your Troop, your school and/or your neighbors.



- \_\_\_\_10. Research and create a list of agencies that provide recycling programs for eyeglasses, gently used clothing, wheelchairs, and other medical equipment (i.e., canes, crutches, walkers, and assistance supplies). Designate local collections vs. those requiring shipping. Organize a collection in your area, or make a presentation to a group promoting their participation in drop off programs.
- \_\_\_\_11. Visit your local grocery store list as many organic products as you can find. Create a report to include your list of organic products and each of the following:
- \_\_\_\_a. Define what it means for a food product to be labeled "certified organic."
  - \_\_\_\_b. List some basic principles of organic farming.
  - \_\_\_\_c. List the benefits and disadvantages of organic farming.
- \_\_\_\_12. Create a short report including each of the following:
- \_\_\_\_a. Define green design and explain how green design differs from traditional design.
  - \_\_\_\_b. Describe the impact of construction on the surrounding ecosystem.
  - \_\_\_\_c. Explain LEED certification and how sustainable design seeks to minimize the impact of construction on the surrounding ecosystem.
  - \_\_\_\_d. Conclude your report by describing a visit to a LEED certified building, or a virtual tour of such a building. List the green design decisions you find.
- \_\_\_\_13. Many household hazardous materials need special handling to be certain that their chemicals do not enter the natural world and contaminate soils or water sources. List as many common household hazardous waste products (or products containing dangerous components) as possible and explain how your community handles these items to protect the environment. Clear out unneeded household hazardous waste and take it to a collection center.

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**TRAIL  
LIFE  
USA**

# Fishing

Name \_\_\_\_\_

As you enjoy the sport of fishing, remember to be respectful and a good steward of the environment that God has given us and to follow all the applicable laws. For safety, appropriate adult supervision is required for all fishing activities including handling fishing tackle, practice casting, fishing, cleaning fish, and cooking fish.

Do all of the following requirements (1-3)

- \_\_\_\_1. There are different types of places to fish including freshwater (streams, rivers, ponds, lakes, frozen lakes) and salt water (lakes, inshore ocean, and off-shore ocean). Make a chart identifying at least two fish to catch and the type of fishing tackle to use in each fishing place type. Note on your chart any fish you might catch that are poisonous or not edible.
- \_\_\_\_2. There are different types of rods, reels, and other fishing tackle for different kinds of fishing (baitcasting, spinning, pole and line, spincasting, fly fishing, and ice fishing). Describe at least two that would be used most in your area and do the following:
  - \_\_\_\_a. List fishing safety precautions and safety equipment.
  - \_\_\_\_b. **Demonstrate tying the fisherman's knot and explain its use.**
  - \_\_\_\_c. Demonstrate setting up a fishing rod, reel, and associated tackle for one of those types of fishing including baiting or fly tying as applicable.
  - \_\_\_\_d. Demonstrate the proper rod and reel skills for your chosen kind of fishing as taught to you by your mentor.
  - \_\_\_\_e. Demonstrate removing a fish from a hook.
  - \_\_\_\_f. Describe what to do for a fish that swallowed a hook.
- \_\_\_\_3. Go on three fishing trips on three separate days. On each of these fishing trips, you will need to do the following:



- \_\_\_\_\_a. Set up your rod, reel, and associated fishing tackle.
- \_\_\_\_\_b. Bait your hook or tie on your flies.
- \_\_\_\_\_c. Catch at least one fish on one of the trips.
- \_\_\_\_\_d. Remove any fish you catch from the hook and either release them or save them in a creel or other fish container.

**Do one of the following two requirements (4-5)**

- \_\_\_\_\_4. With appropriate adult supervision, clean a fish you caught, cook it, and eat it.
- \_\_\_\_\_5. Collect at least three recipes for cooking your catch. On a Troop, Unit, patrol or family fishing trip, prepare a meal of fish your group caught using one of your recipes.

**Do three of the following optional requirements from any topic (6-17)**

**Fishing Techniques**

- \_\_\_\_\_6. Start a tackle box. Include the basic necessities: fishing line, bobber, sinkers, a stringer, hooks, pliers, fillet knife and other sharp tools. Also include sunscreen, insect repellent and first aid basics.
- \_\_\_\_\_7. Explain the different kinds of bait: live, artificial and fresh. and explain the following:
  - \_\_\_\_\_a. How and where you would use each kind
  - \_\_\_\_\_b. Where to get bait
  - \_\_\_\_\_c. How to keep bait fresh
  - \_\_\_\_\_d. What to do with unused bait after you are done fishing? With adult supervision, learn how to put a variety of types of bait on the line.
- \_\_\_\_\_8. Demonstrate baiting fishing tackle with two different baits for each of the three types of bait (live, artificial, and fresh).
- \_\_\_\_\_9. Repeat parts c and d of requirement 2 for a second kind of fishing.
- \_\_\_\_\_10. Demonstrate an improvised fishing technique that is legal in your state. Possible methods might include improvised hooks and lines, soda bottle fishing, bucket or hat scooping, improvised spears, or barehand fishing (trout tickling).

**Additional Fishing Experiences**

On each of these fishing experiences, you will need to do the following:

- \_\_\_\_\_a. Set up your rod, reel, and associated fishing tackle.
  - \_\_\_\_\_b. Bait your hook or tie on your flies.
  - \_\_\_\_\_c. Catch at least one fish.
  - \_\_\_\_\_d. Remove any fish you catch from the hook and either release them or save them in a creel or other fish container.
- \_\_\_\_\_11. Go fishing at a different type of place from the three fishing trips of requirement 3.
  - \_\_\_\_\_12. Go fishing and do a different kind of fishing from the three fishing trips of requirement 3 such as still-fishing, spin fishing, or trolling.
  - \_\_\_\_\_13. Participate in a fishing contest.

### **Leadership and Mentoring**

- \_\_\_\_\_14. Plan a fishing trip for a younger Unit or patrol. Teach them the safety precautions, laws and rules. With appropriate adult supervision, teach the younger Trailmen to fish.
- \_\_\_\_\_15. Plan and go on a father-son fishing trip with your Troop, Unit, or patrol. [Note: You may substitute a different adult family member or family friend within the constraints of youth protection requirements as circumstances dictate.]
- \_\_\_\_\_16. Prepare a list of interview questions including those listed below and then interview a fisherman. Describe the results of the interview.
  - Why do you enjoy fishing?
  - Who taught you to fish?
  - What is your favorite type of fish to catch and why?
  - What helpful tips have you learned over the years?
- \_\_\_\_\_17. Invite someone from the local Department of Natural Resources, or an experienced local fisherman to talk to your Troop, Unit, or patrol about fishing. Ask them to cover at least the following topics:
  - Fishing laws, rules and safety precautions
  - Who needs a fishing license and penalties for not having one
  - How fishing licenses and other types of regulations help maintain our natural resources

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## Followers of Freedom

*Throughout Northern America, there were brave people who helped enslaved men and women. These travelers (escaped slaves) were helped by people known as conductors, on a railroad as such this unsettled country had never seen. They worked together along the Underground Railroad, protecting and directing these weary travelers on their journey across the miles of our great land.*

Name \_\_\_\_\_

### Do all of the following requirements (1-5)

- \_\_\_\_1. Tell about William Wilberforce and what connection he has to the song *Amazing Grace*. Describe his influence on slavery in the United States and include the timing between the fall of slavery in England and in the United States.
- \_\_\_\_2. Research advertisements offering rewards for the return of escaping slaves. Chronicle what affect the Fugitive Slave Act of 1850 had on the capture and return of fugitive slaves, how this was different than what was done previously and describe the impact it had on northern states and citizens.
- \_\_\_\_3. Research the life of a runaway slave that was successful in escaping from the list below. Where was he a slave? What happened to him? Where did life take him after he reached freedom?
  - **Henry "Box" Brown**
  - Frederick Douglass
  - Robert Smalls
  - Harriet Jacobs
  - William & Ellen Craft
- \_\_\_\_4. List several influential abolitionists. Write an essay (at least 1 full page typed) or create an equivalent length computer slide show presentation explaining one of them and what about them stood out more than the others.
- \_\_\_\_5. Research John Brown's attempt at Harper's Ferry, Virginia. List some prominent names of people who helped him or deterred him. Give your opinion of his efforts, motive, etc.

### Do Four of the following optional requirements (6-17)

- \_\_\_\_6. Create a presentation about Frederick Douglass if not chosen for #3 above. Talk about his role in the inclusion of African-American soldiers in the Civil War and his civic roles in governmental service as U.S. Marshall in Washington D.C.
- \_\_\_\_7. Research how Harriet Beecher Stowe got the idea for her famous book. What was it called? What did President Abraham Lincoln say to her about it?
- \_\_\_\_8. Visit a Museum or Monument dedicated to slavery or the abolition of it. Tell what you learned.
- \_\_\_\_9. Discover how many Presidential families had slaves. What is your opinion of what that says about their character considering the times, economy, etc? Tell what you found about their reasons for having slaves and how they treated them.
- \_\_\_\_10. Compare and contrast the journey from slavery in the U.S. and the tragedy experienced by the Jewish people during World War II in Europe.
- \_\_\_\_11. Read or listen to interviews with former slaves recorded in the early part of the 20<sup>th</sup> century. Tell your mentor what you found interesting about each person.
- \_\_\_\_12. Create an antebellum newspaper. Be sure to include key people and events during this time period.
- \_\_\_\_13. Find out what your daily life would have consisted of, as a slave, at your current age, in a specific state during the height of slavery in The United States.
- \_\_\_\_14. Read [Be The Change: Your Guide To Freeing Slaves And Changing The World](#) by Zach Hunter. Does slavery still exist today? What can you do to help?
- \_\_\_\_15. Research the education options for slave children. Were there schools? How did they learn to read and write?
- \_\_\_\_16. Find a current article for each of the unfreedoms (racism, illiteracy, genocide, hunger, tyranny, slavery). Write a summary about each of the articles, including three solutions to the problem presented in each article.
- \_\_\_\_17. Research music in slave life including the following classes: Recreation, Work and Religious. Listen to some song recordings of each category.



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# Founders and Framers

*Groups of men and women at different times in history have made small and large contributions to our great land. We would not be the same missing a single one.*

Name \_\_\_\_\_

## Do all of the following requirements (1-5)

- \_\_\_\_\_1. Research Thomas Jefferson and John Adams and their involvement in the break from England and their work in writing the Declaration of Independence. Explain how their differences of opinion made the Declaration of Independence better.
- \_\_\_\_\_2. Study the life of George Washington from birth to death. Make note each time you see Providence working in his life and how this affected him as a man.
- \_\_\_\_\_3. Read the Preamble to the Constitution and see what you believe the framers were trying to accomplish. List these goals.
- \_\_\_\_\_4. Read the first 10 Amendments to the Constitution also called the Bill of Rights.
  - \_\_\_\_\_a. Who wrote them?
  - \_\_\_\_\_b. When were they written?
  - \_\_\_\_\_c. What reasons do you think there were for adding these specific 10 items to the newly completed *Constitution*?
- \_\_\_\_\_5. What jobs did Abraham Lincoln hold that helped him come to be President and how did these and other events shape the man we know as the Great Emancipator.

## Do Four of the following optional requirements (6-20)

- \_\_\_\_\_6. List the architects of our great nation that have the honor of being on our money and list their corresponding denomination.
- \_\_\_\_\_7. Benjamin Franklin was the witty writer of Poor Richard's Almanac. Make a word search using words about his life, community, service projects, and inventions.
- \_\_\_\_\_8. Learn of the origins of the familiar song Yankee Doodle and have a discussion about the affects it may have had on the morale of the Revolutionary War Troops.
- \_\_\_\_\_9. Learn how the fire at the White House during the War of 1812 was extinguished and what First Lady Dolly Madison saved.

- \_\_\_\_10. Though Pierre L'Enfant was asked to design the great city bearing our first President's name, someone much less famous was a major part of the planning. Identify the free African American that had a huge part in its planning and how he got the job.
- \_\_\_\_11. Research these portrait painters of great men from the Revolution and find which one had numerous family members that continued on in his path.
- \_\_\_\_a. John Copley
  - \_\_\_\_b. John Trumbull
  - \_\_\_\_c. Gilbert Stuart
  - \_\_\_\_d. Benjamin West
  - \_\_\_\_e. Charles Peale
- \_\_\_\_12. Patriot and silversmith Paul Revere gained fame from a poem by Henry Wadsworth Longfellow titled **Paul Revere's Ride**. Read the poem and discuss the event.
- \_\_\_\_13. The fourth President, James Madison, is called the Father of The Constitution. Explain who wrote the Constitution and why Madison has this title.
- \_\_\_\_14. Visit your local Historical Society. Talk with members about the local connection, if any, to the colonial period of our country's history.
- \_\_\_\_15. Develop a Founders and Framers trivia game where the goal is to name the person who has done the act or accomplished the task explained. Play the game with your Patrol or family.
- \_\_\_\_16. Help your family plan a trip visiting one or more historical sights. Document your visit through post cards or photos.
- \_\_\_\_17. Tour the home of a U.S. President.
- \_\_\_\_18. Walk the Freedom Trail in Boston or tour a ship replica from the colonial time period. Make a photo history of your findings.
- \_\_\_\_19. Visit the National Archives in Washington D.C. Find the Declaration of Independence and the Constitution. See how many names you can spot who signed both documents.
- \_\_\_\_20. Explain the difference between Founding Fathers and Framers.

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# Genealogy

Name \_\_\_\_\_

## Do all of the following requirements (1-4)

- \_\_\_\_\_1. Create your family tree going back at least four generations.
- \_\_\_\_\_2. Research your last name and find its origin and meaning.
- \_\_\_\_\_3. **List the most prominent countries in your family's genealogy and highlight those countries on a map.**
- \_\_\_\_\_4. List five interesting things about the people, traditions, culture or history of each of those countries.

## Do five of the following requirements (5-24)

- \_\_\_\_\_5. As far back as you can reasonably trace, list when and how your ancestors immigrated to the United States or if they were already here, list that location in the United States or its precursor.
- \_\_\_\_\_6. Show on your map(s) from requirement 3 above what area in each country your ancestors are from and list who in your family came from these countries and areas.
- \_\_\_\_\_7. Attend a local genealogical society meeting.
- \_\_\_\_\_8. Arrange for a member of a local genealogical society or other knowledgeable person to come and speak to your Troop.
- \_\_\_\_\_9. Research foods from one of the two most prevalent countries of origin discovered in requirement 3 above and plan and cook a meal for your family, Patrol or Troop.
- \_\_\_\_\_10. Research one interesting member of your family tree in-depth and tell your Patrol or Troop about him.
- \_\_\_\_\_11. Interview someone in your family who is older than your parents about your family and its history. Report highlights or show video of the interview to your Patrol or Troop.
- \_\_\_\_\_12. Identify a few of your family heirlooms that your family still has.
- \_\_\_\_\_13. Make a family tree composed of pictures. Note any family resemblances you recognize in yourself or your immediate family members.
- \_\_\_\_\_14. Visit cemeteries connected to your family and take a picture of the oldest grave you find that is associated with your ancestors.



- \_\_\_\_\_15. Find at least one relative living in any of the countries your family members immigrated from. Send a post card about yourself and determine their location in the branches of your family tree.
- \_\_\_\_\_16. Preserve as many old pictures as you can by using a scanner to store them electronically and make a brief slideshow of the most interesting old pictures.
- \_\_\_\_\_17. Genealogy is all about history. The history of you and who God entrusted you to so you could achieve His plan for your life. Write an autobiography of at least 500 words about your life and the path you are on.
- \_\_\_\_\_18. Teach the importance of genealogy and remembering your heritage to a group of younger boys.
- \_\_\_\_\_19. Do a service project that preserves something that is important to history (e.g. clean up a cemetery, build a memorial garden, or help restore a historical building or monument).
- \_\_\_\_\_20. Create a family genealogy trivia game using your research results and play it with your family.
- \_\_\_\_\_21. Participate in an extended family event such as a family reunion.
- \_\_\_\_\_22. Plan and execute a family photo shoot including as many generations as possible.
- \_\_\_\_\_23. Document the details of armed forces service of at least two relatives including dates of service, branch, unit, location, battles, rank, and service recognitions, honors or awards.
- \_\_\_\_\_24. List the relative(s) through which you qualify for Sons of the American Revolution (SAR).

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# Golf

Name \_\_\_\_\_

- \_\_\_\_1. Do the following to learn about golfing:
- \_\_\_\_a. Explain the basic rules of golf and how calling penalties on yourself makes golf different from other sports.
  - \_\_\_\_b. Describe the proper way to score and define the basic scoring terms. Define the following scores: ace (or hole-in-one), double eagle, eagle, birdie, par, bogey, and double bogey.
  - \_\_\_\_c. Explain the following terms: pace of play, hazard, loose impediment, unplayable lie, taking a drop, out of bounds, stroke and distance, ground under repair, playing it as it lies, and casual water.
  - \_\_\_\_d. Explain the basic etiquette of golf, especially related to playing safely, keeping up the pace of play, and taking care of the course.
  - \_\_\_\_e. Explain how the game of golf will provide an opportunity for you to display your honesty, integrity, and patience.
  - \_\_\_\_f. Explain how to stay safe while playing golf, and describe unsafe weather conditions for golf.
  - \_\_\_\_g. Describe the following golf course features: clubhouse, driving range or practice area, tee, fairway, rough, green, flag, hole, water hazard and sand bunker.
  - \_\_\_\_h. List the situations for which irons, woods, and putters are most useful, and explain how to choose the correct club for each shot.
  - \_\_\_\_i. Explain what a handicap is in golf, why it is used, how it is calculated, and how it is used in either match or stroke play.

- \_\_\_\_2. Do one of the following:



- \_\_\_\_\_a. Read a biography of a famous golfer.
- \_\_\_\_\_b. Attend or watch a professional golf tournament.
- \_\_\_\_\_c. Visit a golf show to view the latest clubs and compare them to your clubs. Hit some balls at a computerized driving range and participate in a putting contest while you are there.
- \_\_\_\_\_3. Demonstrate the following:
  - \_\_\_\_\_a. Golf club grips: ten fingers, overlapping, and interlocking
  - \_\_\_\_\_b. Proper swing with a driver, an iron, a wedge, and a putter
  - \_\_\_\_\_c. Proper divot repair
- \_\_\_\_\_4. Over a period of at least six weeks, participate in at least twenty sessions on different days where a session can be any of the following:
  - Team practice for an organized team or league
  - League or team golf games, tournaments, or scrambles
  - A professionally coached skills session, lesson, class, or one day of a golf camp
  - At least one hour of skills practice on the driving range or putting green
  - At least one hour watching an instructional golf video about golf and practicing the skills that you have learned
  - Golfing at least nine holes with family or friends

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# Gymnastics

Name \_\_\_\_\_

- \_\_\_\_1. Do the following to learn about gymnastics:
  - \_\_\_\_a. Describe the proper clothing to wear during gymnastics.
  - \_\_\_\_b. Explain the importance of stretching exercises before participating in gymnastics.
  - \_\_\_\_c. Explain the importance of the job of a spotter in gymnastics.
  - \_\_\_\_d. **Describe the six events and the apparatuses used in men's artistic gymnastics:** floor exercise, pommel horse, still rings, vault, parallel bars and horizontal bar:
  - \_\_\_\_e. Explain the uses of other gymnastics equipment such as: the springboard, chalk, and wedges.
  - \_\_\_\_f. Explain the competitive gymnastics scoring system.
- \_\_\_\_2. Do one of the following:
  - \_\_\_\_a. Attend a gymnastics meet or competition.
  - \_\_\_\_b. Attend or watch an international gymnastics competition.
  - \_\_\_\_c. Read a biography of a famous gymnast.
- \_\_\_\_3. Over a period of at least six weeks, participate in at least eighteen practice sessions on different days where a session can be any of the following:
  - Team practice for an organized team
  - A professionally coached skills session, lesson, or class
- \_\_\_\_4. Participate in at least two organized gymnastics meets or competitions.



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# Horsemanship

Name \_\_\_\_\_

Do all of the following requirements (1-3)

- \_\_\_\_1. Participate in horsemanship training to include at least the following preparation:
- \_\_\_\_a. Demonstrate wearing appropriate riding clothing, footwear, and headgear.
  - \_\_\_\_b. Describe how you should behave and how your voice affects a horse's behavior.
  - \_\_\_\_c. Explain Basic Barn/Stable Safety Rules, including: No loud voices; No running; Pick up and put away supplies and Tack as you go; No climbing on hay, gates, fences, etc.; Never ride or handle your horse alone; Any additional barn/stable rules.
  - \_\_\_\_d. Describe safe riding rules.
  - \_\_\_\_e. Demonstrate how to approach a horse safely and how to fasten a lead rope.
  - \_\_\_\_f. Demonstrate leading a horse with a lead rope and securing it to a hitching post.
  - \_\_\_\_g. Demonstrate the use of the various grooming tools used in caring for a horse such as brushes, currycombs, picks and products.
  - \_\_\_\_h. Demonstrate how to tack your horse using either Western or English equipment.
- \_\_\_\_2. Participate in horseback riding training to include at least the following riding skills:
- \_\_\_\_a. Demonstrate how to mount, sit, and dismount a horse.
  - \_\_\_\_b. Demonstrate starting, stopping, and backing up the horse at marked locations
  - \_\_\_\_c. Demonstrate walking the horse in a straight line
  - \_\_\_\_d. Demonstrate walking the horse in a circle
  - \_\_\_\_e. Demonstrate walking the horse through a weaving or serpentine course.



- \_\_\_\_\_f. Demonstrate trotting the horse in a straight line
- \_\_\_\_\_g. Demonstrate trotting the horse in a circle
- \_\_\_\_\_h. Demonstrate trotting the horse through a weaving or serpentine course.
- \_\_\_\_\_3. Under the supervision of a licensed instructor or outfitter, complete at least 2 hours of trail riding (typically two 1-hour trail rides). For each ride:
  - \_\_\_\_\_a. Review all safety procedures.
  - \_\_\_\_\_b. Log the date, location, and duration (riding time only) of the trail ride.

**Do five of the following optional requirements (4-21)**

- \_\_\_\_\_4. Read a book about horse care.
- \_\_\_\_\_5. Work in a stable for the day.
  - \_\_\_\_\_a. Learn the daily routine involved in caring for a horse.
  - \_\_\_\_\_b. Explain the routine changes from winter to summer?
  - \_\_\_\_\_c. Describe what tools and equipment a well-equipped stable should have
- \_\_\_\_\_6. Learn about feeding horses by:
  - \_\_\_\_\_a. Learning how to select the type and amount of horse feed based on horse breed and activity level.
  - \_\_\_\_\_b. Participating in feeding the horses
- \_\_\_\_\_7. Observe or assist a farrier and/or veterinarian in shoeing or caring for a horse.
- \_\_\_\_\_8. Visit three of the following: race track, trail ride, stable, carriage horse stable, and police stable.
  - \_\_\_\_\_a. Learn their horse care routines.
  - \_\_\_\_\_b. Compare the similarities and differences of the horse care routines.
  - \_\_\_\_\_c. Learn how a horse is safely transported.
- \_\_\_\_\_9. Visit a local stable or horse farm and:
  - \_\_\_\_\_a. Learn how they care for their horses.
  - \_\_\_\_\_b. Explain what is involved in boarding a horse and how much it costs.
  - \_\_\_\_\_c. Describe the kind of shelter a horse needs.

- \_\_\_\_\_d. Determine the cost of owning a horse.
- \_\_\_\_\_e. Determine the cost of riding a horse regularly
- \_\_\_\_\_10. Read a book about horse health care.
- \_\_\_\_\_11. Learn about regular health care for a horse including:
  - \_\_\_\_\_a. Required immunizations, Coggins testing, worming, etc.
  - \_\_\_\_\_b. Common horse illnesses and injuries and what to do about them.
  - \_\_\_\_\_c. Basic hoof care and blacksmithing.
  - \_\_\_\_\_d. The items that should be in a horse medical kit.
- \_\_\_\_\_12. Investigate at least six different careers related to horses. For each career:
  - \_\_\_\_\_a. List the training and/or education required.
  - \_\_\_\_\_b. List the expected salary.
  - \_\_\_\_\_c. Describe the current availability of jobs in that career.
  - \_\_\_\_\_d. Tell if that career appeals to you and why.
- \_\_\_\_\_13. Read a book about horse breeds or history.
- \_\_\_\_\_14. Study the history of the horse and present your findings to your Unit or family.
  - \_\_\_\_\_a. Learn how horses were used during different times in history.
  - \_\_\_\_\_b. Identify six different breeds of horses and the purposes for which they were bred.
- \_\_\_\_\_15. Study the anatomy of the horse and make a chart showing the points of a horse.
- \_\_\_\_\_16. Describe and contrast Western and English riding styles and equipment.
- \_\_\_\_\_17. Research several places in your community where you can go to ride a horse.
  - \_\_\_\_\_a. List what each of them charges for trail rides private lessons, and group lessons.
  - \_\_\_\_\_b. List the facilities of each one including whether or not they have an indoor ring, outdoor ring, or outdoor trails.
  - \_\_\_\_\_c. Visit at least one riding facility.

- \_\_\_\_18. Attend a local horse show or rodeo and describe to your Unit or family the different events and classes of competition and how the judges score the competitions.
- \_\_\_\_19. Participate in three hours of formal horseback riding lessons beyond requirements 1-3.
- \_\_\_\_20. Participate in at least three hours of training for an equestrian sport.
- \_\_\_\_21. Participate in an equestrian sport competition.

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## Hunting



*Hunters of all ages have enjoyed telling their tale of how they harvested their latest trophy or the adventures they had while hunting. The Hunting Trail Badge is designed to help a Trailman to remember what, when, where and how he was able to harvest his game or the adventure it took to get or not get the intended game. This Trail Badge is intended to be an extension of the skills the Trailman learned in his Shooting Sports Trail Badges.*

Name \_\_\_\_\_

All hunting activities must be done under the safety requirements of the *Trail Life USA Health and Safety Guide* and the *Shooting Sports Guidebook*. Equipment used by any registered Trailman must be consistent with his size.

### Do all of the following requirements (1-4)

- \_\_\_\_\_1. Complete the Navigator or Adventurer Shooting Sports Orientation.
- \_\_\_\_\_2. In your own words, do the following
  - \_\_\_\_\_a. Explain why character is critical in hunting
  - \_\_\_\_\_b. Describe why integrity and honor are among the most essential traits to hunting
  - \_\_\_\_\_c. Discuss how sportsmanship applies to Hunting
  - \_\_\_\_\_d. Define hunting and include specific examples.
- \_\_\_\_\_3. Complete the appropriate Hunter Education Certification for your state. This can be done online for a fee in each state or usually for free in an all-day course put on by the state conservation office.
- \_\_\_\_\_4. Pick three of the following methods of hunting and complete all of the activities for each of your chosen three methods. Note: If there are state restrictions regarding centerfire firearms, the Trailman may pick two of the methods of hunting and harvest 3 different game animals.

Methods: Rimfire rifle (Rifle), centerfire rifle (Rifle), light shotgun (Shotgun), heavy shotgun (Shotgun), pistol (Pistol), muzzle loader (Muzzleloading), or bow and arrow (Archery).

- \_\_\_\_\_a. Before you go, do the following for each method of hunting:
  - \_\_\_\_\_i. Complete the corresponding Trail Badge for this method.

- \_\_\_\_\_ii. Describe the equipment you plan to use and your reason for choosing it.
- \_\_\_\_\_iii. Describe the location (including county and state) in which you plan to hunt and how you scouted the area.
- \_\_\_\_\_iv. Describe how you prepared the area you will be hunting.
- \_\_\_\_\_b. After you go, do the following for each method of hunting:
  - \_\_\_\_\_i. Describe the location, method, date, companions and type of game you harvested.
  - \_\_\_\_\_ii. Explain your shot (part of the animal).
  - \_\_\_\_\_iii. Explain how you field dressed the carcass including the tools used.
  - \_\_\_\_\_iv. Explain how you finished processing the carcass including the tools used.
  - \_\_\_\_\_v. Tell how you stored the processed meat.
  - \_\_\_\_\_vi. Cook a portion of the meat for your Patrol, Troop, family or other group and explain the method used.

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# Inventing

Name \_\_\_\_\_

An inventor is someone who creates a new product or process. Inventions can make our life easier, improve our health, or increase our recreation and fun. Throughout history inventors have made huge contributions to society through their innovations.

## Do all of the following requirements (1-3)

- \_\_\_\_1. A patent allows inventors the right to exclude others from making, selling or using their inventions. Do the following to learn more about patents.
  - \_\_\_\_a. Explain the three types of patents (utility, design, and plant) and their differences.
  - \_\_\_\_b. Look up and list what each of the following US patents is:
    - US 1,598,054
    - US 4,688,287
    - US 4,753,377
    - US 1,498,111
    - US 5,425,497
    - US 821,393
    - US 6,923,606
  - \_\_\_\_c. Select one of those patents as an example. Identify and describe each part of the patent: Patent number, Title, Inventors, Assignee, Abstract, Drawings, Description, and Claims.
  - \_\_\_\_d. Find items around your house that have a patent number. Make a list of at least five items along with its patent number, title, inventors, and assignee (owner of the patent rights).

- \_\_\_\_\_e. Describe how to file a patent including who can file one and how much it costs.
- \_\_\_\_\_f. Explain the difference between the phrases “first to invent” and “first to file”.
- \_\_\_\_\_2. Create your own invention and document each step in the process in an invention notebook. Sign and date each invention notebook entry.
  - \_\_\_\_\_a. Explain the importance of keeping a detailed log in the invention notebook and how this information helps if you need to improve your design or start over.
  - \_\_\_\_\_b. Conduct a survey to find out what problems need solutions. Ask what kind of invention, tool, game, device or idea would be helpful at home, work or during recreation time. Report survey results in the invention notebook.
  - \_\_\_\_\_c. Make a list of the problems that need to be solved in the invention notebook.
  - \_\_\_\_\_d. Either individually or with others in your Troop, select one problem that provides the best options for inventive solutions. Record your idea and how you got it in the invention notebook.
  - \_\_\_\_\_e. Brainstorm possible solutions by thinking of the many, varied, and unusual ways of solving the problem. Capture brainstorming ideas in the invention notebook.
  - \_\_\_\_\_f. Record in the invention notebook any problems you encountered and how you solved them. Add sketches and drawings to clarify your thoughts.
  - \_\_\_\_\_g. Choose a solution and make a detailed sketch or 3-D model of it. For the 3-D model, list all materials, costs, and sources.
  - \_\_\_\_\_h. Give your invention a name.
- \_\_\_\_\_3. Develop a marketing plan for your invention, including a slogan or jingle; newspaper, magazine, or web site advertisement; and a radio promo or TV commercial to market your invention.
  - \_\_\_\_\_a. Show the advertisement to your Troop, Unit or family.
  - \_\_\_\_\_b. Perform your radio promo or TV commercial for your Troop, Unit or family.

**Do three of the following optional requirements from any topic (4-12)**

- \_\_\_\_\_4. Choose a household item and create an improved product design.

- \_\_\_\_\_a. Brainstorm ideas to make this invention more useful or fun.
- \_\_\_\_\_b. Describe which parts of the original invention would you keep and which would you change.
- \_\_\_\_\_c. Draw a picture of your improved product and give it a new name. Describe your invention for your Troop, Unit or family.
- \_\_\_\_\_5. Many inventions today are the result of a team working on the same problem. Experience this process with your Troop. Work with a small group to come up with one of the following: A balloon-powered boat, a veggie (or water balloon) catapult, or a new musical instrument. Use the following design process as your guide:
- \_\_\_\_\_a. - Brainstorming: brainstorm ideas with your teammates
- Decide on an invention: decide which of the three inventions you are going to tackle
  - Rough Design: come up with a rough sketch of what you plan on creating. Make sure to think about whether or not it is possible to build, and if you have access to the necessary materials.
  - Design finalization: After seeking feedback from your parents or Leaders, finalize your design and sketch.
  - Invention Creation: build your design. Once you have finished, be sure to test it to make sure it works. Make any necessary changes or alterations.
  - Invention Presentation: Present your invention to your Unit or Troop.
- \_\_\_\_\_b. **After seeing other groups' ideas, identify and describe any improvements you would make on your design.**
- \_\_\_\_\_6. Inventions are not perfect! New products are typically created under certain constraints such as time, cost, efficiency and appearance. For the invention in the above requirement, Report the following:
- \_\_\_\_\_a. Effectiveness of your product
- \_\_\_\_\_b. Design challenges and constraints encountered during the design process
- \_\_\_\_\_c. Changes in design and materials would you make if you could do it again
- \_\_\_\_\_7. Participate in an Invention Fair or contest, entering your own invention. Describe your experience and what you learned with your Unit.

- \_\_\_\_\_8. Choose an inventor and prepare a presentation about him and his invention(s).  
Create a model, or detailed diagram, of the invention as part of your presentation.  
Give the presentation to your Troop, Unit, or family. Include in the presentation:
- \_\_\_\_\_a. the problem to be solved
  - \_\_\_\_\_b. Design constraints
  - \_\_\_\_\_c. Design challenges
- \_\_\_\_\_9. **Plan and implement a Young Inventor's Day or Invention Fair with your Troop and**  
invite parents. Display your invention and tell the story of how you got the idea and  
how your invention works.
- \_\_\_\_\_10. Many inventions result from the testing of current products. Run your own  
evaluation study. For example, you could ask which brand of paper towel is the  
strongest or the most absorbent. Select several brands of a product and make  
predictions about two or three of its characteristics. Conduct experiments to test  
your predictions and share your results with your Unit or family. List improvements  
you would make to the product you tested.
- \_\_\_\_\_11. Invite a local inventor to speak to your Troop. Ask the inventor to tell the details of:
- \_\_\_\_\_a. His invention(s)
  - \_\_\_\_\_b. Any patents received or pending
  - \_\_\_\_\_c. The types of careers involving inventing new products and obtaining patents
- \_\_\_\_\_12. A prototype is an initial or early version of a product, process or system that is used  
to test or prove a concept before the final versions are produced. Rapid prototypes  
are made using different technologies to produce a form, fit functional  
representation of the final product. Explain the basic technologies of the following  
types of rapid prototypes:
- \_\_\_\_\_a. Stereolithography (SLA)
  - \_\_\_\_\_b. Fused Deposition Modeling (FDM)
  - \_\_\_\_\_c. Selective Laser Sintering (SLS)
  - \_\_\_\_\_d. Multi-Jet Modeling (MJM)

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# Kayaking

Name \_\_\_\_\_

The purpose of this badge is to learn the basic terminology and skills to safely control a kayak on flat-water in preparation for a sea trip, river trip, or mixed river and lake back country trip. All kayaking activities in the water or at the waterfront require wearing of a properly fitted personal flotation device (PFD) and must follow the Safe Aquatics Method.

Do all of the following requirements (1-8)

## Preparation

- \_\_\_\_1. Complete the Aquatics trail badge or do the following:
  - \_\_\_\_a. Complete the Swimming Competency Test at the Swimmer level.
  - \_\_\_\_b. Demonstrate the proper way to put on a personal flotation device (PFD)
  - \_\_\_\_c. Demonstrate that the PFD is properly fitted for your use.
  - \_\_\_\_d. Explain why a PFD should always be worn while kayaking.
  - \_\_\_\_e. Demonstrate throwing a floatable object to a distressed person in the water.
- \_\_\_\_2. Participate in a Safe Aquatics Method and kayaking safety orientation that includes the following:
  - \_\_\_\_a. Discussion with your Mentor about your personal swimming abilities, comfort with being near or in the water, and their impact on your kayaking choices
  - \_\_\_\_b. Explanation of the importance of sun protection while on the water
  - \_\_\_\_c. Explanation of weather conditions that preclude kayaking activities
  - \_\_\_\_d. Explanation of appropriate clothing for kayaking at the water front and for kayaking in the back country
  - \_\_\_\_e. Explanation of the extra care that must be taken to get out of a sit-in kayak with a splash skirt vs. a sit-on-top kayak.
- \_\_\_\_3. Discussion of the basic safety procedures in kayaking for: someone who has fallen overboard, being caught in a sudden storm or in the dark, and a capsized kayak.



- \_\_\_\_\_a. Using pictures or a paddle and a kayak:
- \_\_\_\_\_b. Identify the parts of a kayak: hull, cockpit (sit-in), deck (sit-in), carrying handles, bow, stern, starboard, port, seat, and footrests.
- \_\_\_\_\_c. Identify the parts of a paddle: ferrule, shaft, dip ring, throat, and blade.
- \_\_\_\_\_d. Identify and explain what keeps the kayak afloat.
- \_\_\_\_\_e. Demonstrate or explain how to pick the proper paddle for your height.

### Strokes and Paddling

- \_\_\_\_\_4. Standing on dry land, practice and demonstrate following:
  - \_\_\_\_\_a. Properly holding a paddle
  - \_\_\_\_\_b. Feathering a paddle with the blade offset at 45 to 60 degrees
  - \_\_\_\_\_c. Straight: forward stroke, backstroke
  - \_\_\_\_\_d. Turning: forward sweep, reverse sweep, draw stroke, stern draw
- \_\_\_\_\_5. While in the kayak, comfortably demonstrate the following:
  - \_\_\_\_\_a. Properly holding a paddle
  - \_\_\_\_\_b. Feathering a paddle with the blade offset at 45 to 60 degrees
  - \_\_\_\_\_c. Stow your paddle.
  - \_\_\_\_\_d. Straight: forward stroke, backstroke
  - \_\_\_\_\_e. Turning: forward sweep, reverse sweep, draw stroke, stern draw
  - \_\_\_\_\_f. Pivot your kayak in a full circle to the starboard and a full circle to the port.
  - \_\_\_\_\_g. Use a side-to-side sculling stroke to move the kayak abeam starboard five yards and then port five yards.
  - \_\_\_\_\_h. Paddle in a straight line for 150 yards.
  - \_\_\_\_\_i. Stop the kayak abruptly.
  - \_\_\_\_\_j. Kayak in a full circle to the starboard and a full circle to the port.
- \_\_\_\_\_6. With a helper, demonstrate how to safely do the following:
  - \_\_\_\_\_a. Carry a kayak from storage to the launch site.

- \_\_\_\_\_b. Launch a kayak from a dock and from shore.
- \_\_\_\_\_c. Properly hold the kayak for your helper to enter.
- \_\_\_\_\_d. Get in and out of a kayak.
- \_\_\_\_\_e. Secure your gear using square knots.
- \_\_\_\_\_f. Land a kayak at a dock and at the shore.
- \_\_\_\_\_g. Remove the kayak from the water; carry it back and put it away.

### Rescues

- \_\_\_\_\_7. Demonstrate how to rescue someone who has fallen out of or flipped a kayak.
  - \_\_\_\_\_a. With the assistance of the person in the water, demonstrate how to do a kayak-over-kayak rescue to empty the kayak of water.
  - \_\_\_\_\_b. Help the person who has fallen out of his kayak and is in the water get back into their kayak by stabilizing the empty kayak while they climb in.
  - \_\_\_\_\_c. Demonstrate how the kayak can be tilted toward a person having difficulty to help them get out of the water, and then tilted to assist lifting them out of the water.
  - \_\_\_\_\_d. Describe procedures for warming a person who has been rescued from cold water.
- \_\_\_\_\_8. Demonstrate how to properly capsize your kayak and assist with kayak over kayak rescue and perform self-rescue.
  - \_\_\_\_\_a. While in deep water with a rescuer in a second kayak, demonstrate that you can assist the rescuer with kayak-over-kayak rescue.
  - \_\_\_\_\_b. While in deep water with a rescuer in a second kayak, demonstrate that you can enter an empty kayak while the rescuer stabilizes the empty kayak for you.
  - \_\_\_\_\_c. Capsize the kayak again. Turn the swamped kayak over and get into it. Handpaddle the kayak for a minute.
  - \_\_\_\_\_d. Get out of the swamped kayak and turn it upside down again and swim the kayak at least 15 yards to shallow water.

\_\_\_\_\_e. Now, stand and empty the kayak.

**Do three of the following optional requirements (9-18)**

\_\_\_\_\_9. Create a basic first aid and emergency kit that for a one-day kayak trip that prepares you to respond to at least the following: blisters, sunburn, cuts, heat stroke, dehydration, insect bites or stings, heat exhaustion.

\_\_\_\_\_a. Cuts, scrapes, insect bites or stings, blisters, sunburn

\_\_\_\_\_b. Hypothermia, dehydration, heat exhaustion, and heatstroke

\_\_\_\_\_c. Severe bleeding, breathing emergencies, heart attack, and stroke

\_\_\_\_\_d. Person in water in distress or drowning

\_\_\_\_\_e. Rough waters due to storms

\_\_\_\_\_10. Design a course with at least two sharp starboard turns and two sharp port turns. Have a kayak race while following all safety procedures.

\_\_\_\_\_11. Participate in a kayak scavenger hunt with clues that take you to different landing points around the shore.

\_\_\_\_\_12. With other kayaks, have a splash ball game. Toss the splash balls between the kayaks and retrieve them. This will help you learn to maneuver your kayak.

\_\_\_\_\_13. With other kayaks on a large lake, use landmarks to sight a course that would require a half-hour of paddling and then follow it.

\_\_\_\_\_14. Learn and demonstrate how to portage a kayak. Explain the situations under which this might be necessary.

\_\_\_\_\_15. Define painter and do the following

\_\_\_\_\_a. Point out the attachment points on the bow and stern for painters.

\_\_\_\_\_b. Use a bowline to tie painters to the bow and stern of a kayak and demonstrate lining a kayak through a section of river.

\_\_\_\_\_16. Using the **taut-line hitch, two half hitches, and truckers' hitch as needed**, secure a kayak for transport on a trailer, kayak rack, or car roof (using pads).

\_\_\_\_\_17. Create a float plan for your next paddling trip and do the following:

\_\_\_\_\_a. Explain why is a float plan important and who should have a copy.

- \_\_\_\_\_b. List the personal and group equipment needed for an overnight paddle trip.
- \_\_\_\_\_c. Demonstrate the proper way to stow and secure equipment.
- \_\_\_\_\_d. Demonstrate the use of waterproof dry bags for kayak expeditions.
- \_\_\_\_\_18. Learn about kayak and paddle designs and do the following:
  - \_\_\_\_\_a. List at least four materials used to make kayaks and their advantages and disadvantages.
  - \_\_\_\_\_b. List the kind and amount of repair materials and tools you should keep or carry on trips for each kayak material.
  - \_\_\_\_\_c. Describe proper maintenance and upkeep for kayaks including storage, transportation and repairs.
  - \_\_\_\_\_d. Explain how length, beam and shape of kayaks affect their handling and how to choose a kayak design best for trip type and water characteristics.
  - \_\_\_\_\_e. Explain which type of paddle should be used based on type of trip, water conditions.

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# Lifesaving

Name \_\_\_\_\_

Lifesaving is a certification badge. One nationally recognized course is American Red Cross (ARC) Junior Lifeguarding. There may be other local courses run by fire departments or other emergency services entities that are substantially equivalent to ARC Junior Lifeguarding and would meet the minimum Trail Badge standards.

ARC Junior Lifeguarding is for ages 11-14 and does not qualify one to serve as a lifeguard, but rather is preparation for ARC Lifeguarding.

ARC Lifeguarding is a Freedom Experience in Adventurers and should not be used for an elective Trail badge.

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**TRAIL  
LIFE  
USA**

# Martial Arts

Name \_\_\_\_\_

- \_\_\_\_1. Do the following to learn about martial arts:
  - \_\_\_\_a. Describe three different types of martial arts.
  - \_\_\_\_b. Explain three different fighting distances.
  - \_\_\_\_c. List safety guidelines for practicing a martial art.
  - \_\_\_\_d. Explain the importance of warming up and stretching before you practice and cooling down and stretching after you practice.
  - \_\_\_\_e. Explain the role breathing plays in stretching exercises.
  - \_\_\_\_f. Define the role of respect, dignity and discipline in your martial art.
  - \_\_\_\_g. Explain the importance of understanding that martial arts are a means to escaping a confrontational or dangerous situation, not the means for starting one.
  - \_\_\_\_h. Explain why you should never spar without an instructor.
  - \_\_\_\_i. Explain the proper protection to wear when sparring.
  - \_\_\_\_j. Explain the tradition behind wearing a uniform when practicing or testing.
  - \_\_\_\_k. Explain the belt system of your particular martial art system.
- \_\_\_\_2. Do one of the following:
  - \_\_\_\_a. Read about different martial arts styles besides the one you practice.
  - \_\_\_\_b. Read a biography of a famous martial arts competitor or personality.
  - \_\_\_\_c. Attend or watch a martial arts competition.
- \_\_\_\_3. Over a period of at least six weeks, participate in at least eighteen professionally coached skills sessions, lessons, or classes on different days.
- \_\_\_\_4. Do two of the following:



- \_\_\_\_\_a. Participate in a test session where you advance.
- \_\_\_\_\_b. Compete in a martial arts competition.
- \_\_\_\_\_c. Demonstrate one kata and proper punching, kicking, and breathing.
- \_\_\_\_\_d. Demonstrate proper throws, holds, escapes, and breathing.
- \_\_\_\_\_e. Describe the purpose and use of two weapons included in your martial art.

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## Military Heritage

*Our United States Armed forces are divided into five branches, regulated by Congress and set up to provide protection for our country though many different avenues. Great honor and respect is due these men and women that have placed their country before their comfort.*

Name \_\_\_\_\_

### Do all of the following requirements (1-5)

- \_\_\_\_\_1. Name five branches of the United States Armed Forces. Research and describe what they do, when they were created, how they protect our country, and how they are different in their specialties.
- \_\_\_\_\_2. Name the three military academies in the United States, when they were created, where they are located, and which branch of the service they represent. List some notable graduates from each and their future military accomplishments.
- \_\_\_\_\_3. Define conscription and tell of at least three times in U.S. history that it was used and what the criteria were at each individual time.
- \_\_\_\_\_4. Describe the federal Posse Comitatus Act, and explain why it is important.
- \_\_\_\_\_5. List all the National Holidays relating to military service and explain their origins and observances.

### Do four of the following optional requirements (6-24) with at least one from the first category:

#### The Military Experience (Do at least one)

- \_\_\_\_\_6. Accompanied by your parent, visit with a recruiter from one of the five branches of military. Find out the requirements for entrance and describe them to your Mentor.
- \_\_\_\_\_7. Interview an active duty or retired member of the military. Find out why they enlisted or if they were conscripted, what they expected to get out of the experience, and how the reality varied from their expectations.

#### Honoring Veterans

- \_\_\_\_\_8. Honor a veteran or active military person, family or group with a service project. For example, sending care packages to Troops overseas or adopting a military family during the holidays.
- \_\_\_\_\_9. Participate in a Veterans Day or Memorial Day ceremony or parade.
- \_\_\_\_\_10. Describe the origin of Arlington National Cemetery and its current sacred duty.
- \_\_\_\_\_11. Describe the GI Bill and its importance.

#### Military History

- \_\_\_\_\_12. Visit a National Battlefield; be able to tell who won, how long the battle lasted and any notable soldiers that fought there.
- \_\_\_\_\_13. Visit Gettysburg National Military Park; explain the terrain and how seeing it in person helped you to understand the Union winning the battle and making it the turning point of the Civil War.
- \_\_\_\_\_14. Plan a family trip following the Civil War Trails. Document the battlefields and historic sites you stop at.
- \_\_\_\_\_15. Visit a military museum and describe what you learned.
- \_\_\_\_\_16. Research the origin of at least one military song (hymn).
- \_\_\_\_\_17. Choose a famous patriot who died in battle. Give a brief history of his life and career to your troop.
- \_\_\_\_\_18. Many people who have a hard time choosing a good path for their life turn to the military. Ulysses S. Grant was a great example of this. Tell about his early life and how his later life contrasted with its beginnings.
- \_\_\_\_\_19. Attend a battle reenactment (e.g. Civil War reenactments) and describe what you saw.

### Military Operations and Strategy

- \_\_\_\_\_20. Learn and list the differences between officers and non-commissioned officers. Select a branch of military service and learn the ascending order of rank and how the rank is displayed on their uniform.
- \_\_\_\_\_21. Catalog the transportation vehicles used in one of the five branches of military (e.g. tanks, planes, submarines).
- \_\_\_\_\_22. Plan a military strategy session ending in a game of capture the flag using your plan. Describe what worked, what did not, and what improvements in strategy could be used the next time.
- \_\_\_\_\_23. Compare the Armor of God to the implements used in battle. Which do you think is the most crucial?
- \_\_\_\_\_24. Participate in a battle reenactment (e.g. Civil War reenactments) and describe your role in the overall battle strategy.

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# Model Rocketry

Name \_\_\_\_\_

Do all of the following requirements (1-7)

- \_\_\_\_1. Explain the following about model rocketry:
  - \_\_\_\_a. History
  - \_\_\_\_b. The governing body that provides the rules
  - \_\_\_\_c. New technologies being used
- \_\_\_\_2. Describe Newton's Three Laws of Motion and how each applies to rockets and rocket motors.
- \_\_\_\_3. Explain the safety concerns and considerations in:
  - \_\_\_\_a. Designing a model rocket
  - \_\_\_\_b. Building a model rocket
  - \_\_\_\_c. Launching a model rocket
  - \_\_\_\_d. Recovering a model rocket
- \_\_\_\_4. Describe the purpose of each of the following components (a-i)

____a. Body tube	____f. Motor
____b. Engine mount	____g. Nose cone
____c. Fins	____h. Payload
____d. Igniter	____i. Recovery system
____e. Launch lug	
- \_\_\_\_5. Design a rocket using one of the following methods:
  - \_\_\_\_a. Using open source software such as OpenRocket,
  - \_\_\_\_b. Design a rocket using an online rocketry basic building class
  - \_\_\_\_c. Design a model rocket kit using RockSim software
- \_\_\_\_6. Build the rocket you designed using commercially available model rocket components.
- \_\_\_\_7. Launch and recover the rocket you designed and built using one or more of the following techniques:
  - \_\_\_\_a. Parachute
  - \_\_\_\_b. Streamer
  - \_\_\_\_c. Glide or heli-blade



**Do three of the following optional requirements (8-20)**

- \_\_\_\_\_ 8. In addition to the required launch and recovery of a model rocket, participate in a troop, local or club sponsored competition where you launch a rocket in at least one competition type.
- \_\_\_\_\_ 9. Research the National Association of Rocketry (NAR) rules for competitions. Describe rules for one competition such as highest altitude single-stage, highest altitude multi-stage, egg loft competition, rocket golf, or boost glider duration.
- \_\_\_\_\_ 10. Give an oral or written report how the sport of model rocketry can be applied to a career in Science, Technology, Engineering, or Mathematics.
- \_\_\_\_\_ 11. Attend a local NAR club meeting.
- \_\_\_\_\_ 12. Attend a NAR competition as a spectator and describe what you saw and learned. This must not be the same competition as used for any launch for this Trail Badge.
- \_\_\_\_\_ 13. **Explain Newton's third law of motion to a Woodlands Trail Patrol or Unit and lead them through launching Alka-Seltzer Rockets.**
- \_\_\_\_\_ 14. **Explain Newton's third law of motion to a Woodlands Trail Patrol or Unit and lead them through launching Water Rockets.**
- \_\_\_\_\_ 15. Assist a Woodlands Trail Patrol or Unit in building model rockets from a kit and launching them in accord with all safety rules and state and local laws.
- \_\_\_\_\_ 16. Research two famous engineers or scientists in rocketry and report what degrees they earned, their major accomplishments, and what organizations they led or for which they performed significant engineering or science.
- \_\_\_\_\_ 17. With a parent, attend a meeting of a local professional society in your locality related to rocketry, such as the American Institute of Aeronautics and Astronautics (AIAA). List any scholarships or special opportunities for youth and young engineers or scientists that the Society may sponsor.
- \_\_\_\_\_ 18. Modern engineering specialties related to rocketry include aerospace, chemical, computer, control systems, electrical, electronics, mechanical, metallurgical and materials, software, and systems engineering. Choose two specialties you have not used for another Science and Technology Trail Badge and do the following:
  - \_\_\_\_\_ a. Describe what type of work is done in those two engineering specialties and how the work of those two specialties is related.
  - \_\_\_\_\_ b. Choose one specialty, and explain the education, training, and experience required to serve successfully in that profession.
- \_\_\_\_\_ 19. *Note: This requirement is listed in multiple Trail Badges, but may only be used for one Trail Badge.* Explain what it means to be an Engineer Intern and a Licensed Professional Engineer. List the requirements to become a Licensed Professional Engineer in your state.

- \_\_\_\_\_20. *Note: This requirement is listed in multiple Trail Badges, but may only be used for one Trail Badge.* Read the Code of Ethics or Professional Conduct for Professional Engineers for your state (or NSPE Code of Ethics for Engineers if your state does not have one). One role of the engineer is providing society with accurate facts in order to make the best possible decisions.
- \_\_\_\_\_a. Explain how the code you read relates to the Trailman Oath and good stewardship.
- \_\_\_\_\_b. List possible consequences to the public if an engineer does not follow this Code.

### Resources:

National Association of Rocketry (NAR) web site: [www.nar.org](http://www.nar.org) - Provides information of model rocketry, competitions, rules, and local clubs.

### Newton's Three Laws of Motions

- Law of Inertia: An object at rest will remain at rest unless acted on by an unbalanced force. An object in motion continues in motion with the same speed and in the same direction unless acted upon by an unbalanced force.
- Acceleration is produced when a force acts on a mass. The greater the mass (of the object being accelerated) the greater the amount of force needed (to accelerate the object). For a constant mass, Force = mass times acceleration. Note that a rocket has a decreasing mass.
- For every action (force), there is an equal and opposite reaction (force).

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## Muzzle Loading (Rifle, Pistol, or Shotgun)



Name \_\_\_\_\_

All Muzzle Loading activities must be done under the safety requirements of the *Trail Life USA Health and Safety Guide* and the *Shooting Sports Guidebook*.

### Do all of the following requirements (1-4)

- \_\_\_\_\_1. Complete the Navigator or Adventurer Shooting Sports Orientation.
- \_\_\_\_\_2. Complete the basic trail badge (Rifle, Shotgun, or Pistol) for the type of muzzle loading fire arm you will use to complete the badge.
- \_\_\_\_\_3. Participate in a muzzle loading safety orientation that includes the Trailman doing the following:
  - \_\_\_\_\_a. Recite from memory the three rules of the *Gold Standard in Gun Safety* guidelines in the Shooting Sports Guidebook or Shooting Sports Supplement.
  - \_\_\_\_\_b. Explain the Rules for Safe Gun Use and Storage.
  - \_\_\_\_\_c. Describe or demonstrate the common Range Commands.
  - \_\_\_\_\_d. List the proper safety gear for muzzle loading shooting.
  - \_\_\_\_\_e. Describe how to safely verify whether a muzzle loading gun is loaded or unloaded.
  - \_\_\_\_\_f. Describe how to safely pick up a muzzle loading gun and carry it from one place to another.
  - \_\_\_\_\_g. Explain the importance of packing the powder tightly and describe how to verify that the powder is properly packed.
  - \_\_\_\_\_h. List the major hazards that may be encountered during Muzzle Loading shooting sport activities and describe how to care for them.
- \_\_\_\_\_4. Successfully complete the NRA-NMLRA Basic Muzzleloading Shooting Course for the discipline chosen (Rifle, Pistol, or Shotgun).

Do three of the following requirements with a least one from each category (5-15)

**Muzzle Loading Heritage (Do at least one)**

- \_\_\_\_5. Research a Muzzleloading heritage topic and report your findings to your instructor in a concise written or oral form.
- \_\_\_\_6. Participate in a Revolutionary War Veterans Association (RWVA) heritage event (AppleSeed or LibertySeed). Note: If you attended an AppleSeed event for rifle shooting experience for the Rifle Trail Badge, the heritage part of the same event can be applied to this requirement.
- \_\_\_\_7. Visit a National Battlefield for which muzzle loading weapons played a significant role (Civil War and before). Describe several types of muzzle loading guns used in that battle and their effectiveness.
- \_\_\_\_8. Visit a military museum that includes a display of muzzle loading guns and describe what you learned.
- \_\_\_\_9. Attend or participate in a battle reenactment for a battle which used muzzle loading guns and describe what you saw.

**Muzzle Loading Shooting Experience (Do at least one)**

- \_\_\_\_10. Play one or more shooting range games that involves shooting a total of at least 25 muzzleloading rounds for each participant. Some example games are listed in the Shooting Sports Supplement.
- \_\_\_\_11. Participate in shooting sampler day and shoot at least 3 different muzzleloading gun types (e.g. TLUSA Recoil Rally in Georgia).
- \_\_\_\_12. Earn a Pro-marksman or higher Winchester/NRA Marksmanship Qualification in any Muzzle Loading discipline.
- \_\_\_\_13. Shoot a round of Trap (15 birds) with a muzzle loading shotgun.
- \_\_\_\_14. Shoot a round of Skeet (16 birds) with a muzzle loading shotgun.
- \_\_\_\_15. Participate in a muzzle loading gun clinic or competition sanctioned by the National Muzzle Loading Rifle Association (NMLRA), National Rifle Association (NRA), or National Shooting Sports Foundation (NSSF).

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## My State

*The individual states in our nation are like the patches of a quilt with the state's individual rights on the square, and the constitution being the thread that holds them all together. What a beautiful picture of the various people and ideas that make our nation great.*

Name \_\_\_\_\_

### Do all of the following requirements (1-5)

- \_\_\_\_1. Get a state map from your state, AAA, or other source and do the following:
  - \_\_\_\_a. Mark the original state boundaries on the date it was admitted into the union if there have been any changes.
  - \_\_\_\_b. Mark the locations of the earliest settlements and/or missions in the territory of your state.
  - \_\_\_\_c. Mark the highest and lowest elevation points.
  - \_\_\_\_d. Identify the state capital and the five most populous cities.
  - \_\_\_\_e. Show, on the map, the major geographical areas of interest in your state.
- \_\_\_\_2. List the major Native American tribes who inhabited your state first. Show on the map where they lived, describe any major battles they fought, and tell where they ended up geographically in our nation.
- \_\_\_\_3. Explain where the major immigrant groups to your state were from and why they chose to settle in your state. Show on the map where the different groups settled.
- \_\_\_\_4. Explain the circumstances that led to the creation of your state.
- \_\_\_\_5. Describe the major ecosystems of your state and show on the map where they are located.

### Do four of these optional requirements (6-21)

- \_\_\_\_6. Explain the modes of transportation used in your state and if one is more prevalent in the more populated areas. Show the locations of major transportation infrastructure on the map.
- \_\_\_\_7. Choose a current event in your state or local community and make your opinion known through a letter or phone call to your local or state representative.
- \_\_\_\_8. List the National Parks, National Historic Trails, National Scenic Trails, National Recreation Trails, State Scenic Trails, and State Historic Trails found in your state. Pick one and describe its history and its current use and purpose.

- \_\_\_\_\_9. Visit one of the State or National Parks in your state and describe what you learned on your visit.
- \_\_\_\_\_10. Hike on one of the trails identified in requirement 8 above.
- \_\_\_\_\_11. List all the endangered species of animals in your state. Choose one and give a description of it and its habitat to your Patrol or Troop. Show the location of its habitat on the map.
- \_\_\_\_\_12. Calculate the total square mileage in your state, the square mileage of inhabited areas, and the square mileage uninhabited areas.
- \_\_\_\_\_13. **Looking at state's rights and laws, find three laws in your state that do not apply in a neighboring state.**
- \_\_\_\_\_14. **Find an old law still on the books that is so farfetched you can't imagine it being enforced.** Explain why it was made a law and how it might infringe on our constitutional rights.
- \_\_\_\_\_15. Find a recently enacted law that appears to be unconstitutional. Explain when it was made a law and why.
- \_\_\_\_\_16. Make a list of ten or more things that you would recommend someone do while visiting your state.
- \_\_\_\_\_17. Describe the economy of your state and the industries that drive the economy. Show the areas of the major industries on the map.
- \_\_\_\_\_18. Visit a museum or monument that honors something native to your state.
- \_\_\_\_\_19. **Describe your state's affiliation during the Civil War, its involvement and notable events and people.**
- \_\_\_\_\_20. Take a tour of your state capital and legislative offices. Meet your state representatives if possible.
- \_\_\_\_\_21. Go to the Capitol in Washington D.C. and take the tour. Note all the State statues and document the one from your state. Meet a Representative if possible.

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## Native Americans

*Before Christopher Columbus or our great countries name sake Amerigo Vespucci, this land of ours was occupied by indigenous inhabitants. Though many different nations had tried to inhabit different areas, the common thread was the Native Americans. They lived all over the continent in every topography. There are still hundreds of different Native American tribes, all varying in customs and traditions.*

Name \_\_\_\_\_

### Do all of the following requirements (1-5)

- \_\_\_\_1. Compare and contrast the traditional lifestyles, homes, clothing, food, traditions, etc. of Native American tribes from at least five different regions of the country.
- \_\_\_\_2. Research Native American's trading with the colonists. List what type of goods were traded and where.
- \_\_\_\_3. Make a list of at least five famous Native Americans. Tell what made each individual famous, to which tribe did they belonged and share at least one interesting fact about them.
- \_\_\_\_4. Find one of the many stories where if it weren't for the Native American people this fledgling nation might not have survived.
- \_\_\_\_5. Research the Native American tribes that lived in your local area. Make a PowerPoint presentation, poster or booklet to teach your Patrol or a younger patrol about their culture and customs.

### Do Four of the following optional requirements (6-16)

- \_\_\_\_6. List the names of the 50 states. Research which names have Native American origins.
- \_\_\_\_7. Find out which foods were eaten by Native Americans in your area and how they acquired and prepared them.
- \_\_\_\_8. Visit a museum to find out about Native American tribes. Look at the artifacts they have and their uses. Look for any examples of Native American Art and note something interesting about them.

- \_\_\_\_9. Build a replica of one of the many types of Native American dwellings. Such as tepees, wigwams, log houses, chickees, lean-tos, etc. Bring it to a meeting to show your troop and explain what was used to build it and what they would have used to build it in the past, if it differs.
- \_\_\_\_10. **Native Americans' spiritual beliefs** often differed from those of Christianity as missionaries had not reached them with the good news of Christ. Without the saving knowledge of Christ, the Native Americans believed in a higher power or **spirit and used tools to "talk" to the spirits like** Kachina dolls and dream catchers. Discuss with your family or patrol which tribes used these items and what they meant.
- \_\_\_\_11. Research the body markings and head dresses of different tribes and describe their meaning and significance.
- \_\_\_\_12. Explain what wampum is and **explore what place it had on Lewis and Clark's** journey.
- \_\_\_\_13. Build a life size tepee and share the experience with your patrol or the younger boys in your Troop.
- \_\_\_\_14. Sleep in the tepee on a camping trip.
- \_\_\_\_15. Arrange to meet with an individual of Native American descent. Ask him/her to explain to you about the culture and customs. Take notes and discuss what you learned with your mentor.
- \_\_\_\_16. Over the course of history the treatment of the Native American people has been called into question. Create a list contrasting what was done to these indigenous people and how America tried to compensate. What things are still in place that were initiated during the dispersing and uprooting of these Native American people?

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# Nature and Wildlife

Name \_\_\_\_\_

The natural world surrounds us. Depending on where you live, you may find rich forests, high mountains, vast deserts, or wide open prairies. Some Trailmen live by an ocean or along the shores of great lakes, rivers, streams, or brooks. Each of these areas supports different types of plants and wild animals. Each grouping of natural elements, plants and animals is called a habitat. This Trail Badge introduces you to the plants and animals that live in the habitat(s) near where you live, and to introduce conservation topics and activities to protect these habitats.

Do eight of the following requirements with at least one from each topic

## Plants

- \_\_\_\_1. Take a tree identification hike. Identify at least twelve different trees. Explain which features are used for identification and which features depend on the time of year or the season.
- \_\_\_\_2. Identify five different plants with edible fruits or nuts. Explain which features are used for identification (for example: bark, leaves, flower, etc.).
- \_\_\_\_3. Find out what types of wildflowers grow in your area. Go on a wildflower hunt and record what types of wildflowers you find and where you found them. Draw pictures of them and compile a booklet with all the information you have.
- \_\_\_\_4. Go on at least one nature hike focused on plants. Bring along a field guide to local plants and trees and identify at least 15 different trees and other plants you see along the way.

## Animals

- \_\_\_\_\_5. Identify three wild animals that are native to your state from four of these groups: birds, mammals, reptiles and amphibians, insects and spiders, fish, mollusks and crustaceans (i.e. twelve animals in four groupings) Then, for each of the twelve animals, report on the following: diet, habitat, shelter, benefits to humans, if it is endangered, and how it is protected if endangered.
- \_\_\_\_\_6. Fossils can give us clues about what types of plants and animals once lived in an area. Go on a fossil hike. Using a piece of paper and a crayon/pencil, make rubbings to record at least five different fossils you find. Using the library or Internet, identify at least two of the fossils you recorded.
- \_\_\_\_\_7. Go on at least one nature hike focused on animals with your. Bring along a camera and a field guide to local animals. Categorize the animals you observe into the following six categories: birds, mammals, reptiles and amphibians, insects and spiders, fish, mollusks and crustaceans. Find, photograph, and identify at least three wild animals that are native to your state from four of these six groups.

### **Habitats**

- \_\_\_\_\_8. Explore the edge of a pond or lake, or the side of a stream. Make a list of the things that you find, breaking your list down into categories such as plants, birds, mammals, reptiles and amphibians, insects and spiders, fish, mollusks and crustaceans, etc. Explain how the different things you found are all interdependent. Explain how the animals in your region might use this habitat (e.g. cover, feeding, nesting, etc.).
- \_\_\_\_\_9. Visit a wildlife refuge or a nature center. Learn how it provides a habitat for wildlife. Find out if there are ways that the area is being managed to provide a habitat for different types of wildlife. Make a list of the things that you find, breaking your list down into categories such as plants, birds, mammals, reptiles and amphibians, insects and spiders, fish, mollusks and crustaceans, etc.

- \_\_\_\_10. Take a hike with your Unit or family. Stop at three different habitats along the way such as a meadow, stream, and forest. At each stop wait silently for at least five minutes. Record the features of the habitat that you see and what sounds you hear. Describe how the sounds differ for each habitat and explain what that tells us about each habitat.
- \_\_\_\_11. Organize and lead a micro nature hunt for a younger unit or patrol. Mark off separate 3 foot by 3 foot areas for each Trailman. Supply each with a magnifying glass and journal and help them investigate what is there. Have them draw pictures of the insects and plants they observe to record their findings. Collect and show the books to your Mentor if he is not at the activity.

### Conservation

- \_\_\_\_12. Participate in a conservation project through a local park, school, conservation organization, etc.
- \_\_\_\_13. List at least ten ways that your Troop, Unit, patrol, or family can help to conserve nature. Create a short video, presentation, speech, pamphlet, or other creative way to present this information and make a presentation to your Troop, Unit, patrol, or family.
- \_\_\_\_14. Plan and lead a conservation project in your area.
- \_\_\_\_15. Research an endangered species in your area. Prepare a brief presentation for a younger Unit with pictures or puppets of the animal, which explains why it has been declared endangered and what critical habitat means.
- \_\_\_\_16. Identify at least five careers involving nature and wildlife and talk to a person in one of these careers. Report the following:
- Required educational training or experience
  - Daily activities of the job
  - Factors that influenced the selection of this career field
  - Which careers interest you
- \_\_\_\_17. Research two conservation organizations. For each organization, describe how three of their conservation activities exercise good environmental stewardship.

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# Orienteering

Name \_\_\_\_\_

Orienteering has turned map and compass knowledge into a competitive sport combining racing and navigation. For safety, you and your buddy should enter competitions as a team of two so that you can stay together on the course.

Prerequisite: Complete Trail Skills prior to starting on this Trail Badge.

Read the Beginner's Guide on the Orienteering USA website (See Resources below) and do all of the following requirements (1-4)

- \_\_\_\_\_ 1. Do all of the following requirements (a-d)
  - \_\_\_\_\_ a. Briefly describe four other types of orienteering events besides the standard format of a point-to-point race.
  - \_\_\_\_\_ b. Show a sample orienteering map and using the downloadable Orienteering Map Symbols/Legend page point out key features on the map and explain the coloring.
  - \_\_\_\_\_ c. For the standard point-to-point race, list the skills required for each of the three lowest levels: White, Yellow, and Orange.
  - \_\_\_\_\_ d. List the basic equipment and clothing for entry-level orienteering.
- \_\_\_\_\_ 2. Do two of the following requirements (a-e)
  - \_\_\_\_\_ a. Measure your pace in meters for level, uphill, and downhill walking or running.
  - \_\_\_\_\_ b. Present the orienteering formats, course types, and maps to your Troop or any Unit or Patrol in your Troop using PowerPoint, video, or a presentation board.
  - \_\_\_\_\_ c. Create a string, line, or other age-appropriate orienteering course for your Troop's Woodlands Trail Patrols. Supervise their attempts on the course.
  - \_\_\_\_\_ d. Set a *White* point-to-point course with six controls and write a Control Description. Supervise the Woodlands Trailmen attempts on the course.
  - \_\_\_\_\_ e. Help plan and implement an orienteering circuit training event for your troop.
- \_\_\_\_\_ 3. Over a period of at least six weeks, participate in at least twenty sessions on different days where a session can be any of the following requirements (a-f)
  - \_\_\_\_\_ a. Individual or group orienteering skill building practice of at least 30 minutes such as the skills identified in *Orienteering Circuit Training* (See Resources)



- \_\_\_\_\_ b. A professionally coached or orienteering club skills session, lesson, or class
  - \_\_\_\_\_ c. An attempt to finish (including DNF and MSP when you found most controls) an orienteering event point-to-point course at any color level
  - \_\_\_\_\_ d. Completion of a permanent course, including repeats for practice.
  - \_\_\_\_\_ e. Completion of a Score-O at an orienteering event.
  - \_\_\_\_\_ f. Running practice of least 30 minutes, five km, or three miles continuous running with a warm-up/cool down and stretch before and after running.
- \_\_\_\_\_ 4. As part of the courses completed for 3, complete one of the following requirements (a-b)
- \_\_\_\_\_ a. Successfully finish an Orange point-to-point course at an orienteering event
  - \_\_\_\_\_ b. Successfully finish three different orienteering courses which may be any combination of the following:
    - \_\_\_\_\_ i. White or Yellow point-to-point course at an orienteering event
    - \_\_\_\_\_ ii. Any color permanent point-to-point course
    - \_\_\_\_\_ iii. Any alternate course at an orienteering event such as a Score-O

## Resources for Orienteering

Control marking methods for youth set courses:

Different shaped hole punches on cards with control numbers

Different colored markers at each station.

Beginner's Guide:

<https://www.orienteeringusa.org/new-o/beginners-guide>

Youth Orienteering 1-2-3

<https://www.orienteeringusa.org/youth-leaders/materials/o-1-2-3>

Orienteering for the Young:

<https://www.orienteeringusa.org/youth-leaders/materials/o-young>

How to select an orienteering course

<https://www.orienteeringusa.org/new-o/select-course>

Orienteering terms:

<https://www.orienteeringusa.org/new-o/o-lingo>

Selecting an appropriate level orienteering course:

<https://www.orienteeringusa.org/new-o/select-course>

IOF Control Descriptions:

<https://www.maprunner.co.uk/iof-control-descriptions/>



Orienteering Circuit Training:

<https://www.orienteingusa.org/circuit-training>

Permanent Course Listing:

<https://www.orienteingusa.org/new-o/resources/permanent-courses>

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# Paintball



Name \_\_\_\_\_

All Paintball activities must be done under the safety requirements of the *Trail Life USA Health and Safety Guide* and the *Shooting Sports Guidebook*.

## Do all of the following requirements (1-5)

- \_\_\_\_1. Complete the Navigator or Adventurer Shooting Sports Orientation.
- \_\_\_\_2. Participate in a Paintball orientation that covers the following:
  - \_\_\_\_a. Description of Paintball and basic rules
  - \_\_\_\_b. Safe Zones
  - \_\_\_\_c. Field Conduct including:
    - \_\_\_\_i. Expected behavior when a player is Hit
    - \_\_\_\_ii. Expected behavior by Deadmen
    - \_\_\_\_iii. Appropriate action against players fighting over a disputed call
    - \_\_\_\_iv. All hits against the body and gear are considered Hits except under the rules which may exclude splatter, marker, and/or head hits.
    - \_\_\_\_v. **Calling "Blind Man" to stop the game for an emergency or inability to see**
  - \_\_\_\_d. When to call Surrender and at what distance
  - \_\_\_\_e. Maximum paintball velocity in feet per second (FPS) or meters per second (MPS) for indoor and outdoor games including close quarters combat(CQB) for the following weapons:
    - \_\_\_\_i. Standard Paintball Marker
    - \_\_\_\_ii. Sniper Marker
    - \_\_\_\_iii. Hand Grenades
    - \_\_\_\_iv. M203 launched Grenades
- \_\_\_\_3. Participate in an Paintball safety orientation and do the following:



- \_\_\_\_\_a. Recite from memory the three rules of the *Gold Standard in Gun Safety* guidelines in the Shooting Sports Guidebook or Shooting Sports Supplement.
  - \_\_\_\_\_b. List the Six Rules for Safe Paintball Marker Handling and describe similarities to and differences from the three rules of the *Gold Standard in Gun Safety* guidelines.
  - \_\_\_\_\_c. Describe or identify the parts of a paintball marker including: the hopper, Gas Valve/System, Barrel plug, Marker body, Air regulator, and Bolt
  - \_\_\_\_\_d. Explain how Paintball Markers differ from actual firearms; list at least three examples.
  - \_\_\_\_\_e. Describe how to properly transport a Paintball Marker.
  - \_\_\_\_\_f. Explain and demonstrate the proper safety gear for Paintball game play and describe the importance of the following safety gear:
    - \_\_\_\_\_i. Face mask: full vs. partial masks ,throat protection, and anti-fogging methods
    - \_\_\_\_\_ii. Clothing: paintball specific gear versus normal street clothes
    - \_\_\_\_\_iii. Proper footwear.
    - \_\_\_\_\_iv. Gloves
  - \_\_\_\_\_g. Explain and demonstrate proper trigger control
  - \_\_\_\_\_h. Demonstrate how to safely Load, Unload, and CLEAR the following Paintball Marker types.
    - \_\_\_\_\_i. MagFed markers (i.e. Tippmann US Army Marker or TCR MagFed Markers –Rifle/Pistol)
    - \_\_\_\_\_ii. Gravity or electric fed hopper markers (CO2/HPA)
    - \_\_\_\_\_iii. Air driven hopper configured markers (CO2/HPA)
  - \_\_\_\_\_i. Describe proper handling and use of the following:
    - \_\_\_\_\_i. Barrel Plug
    - \_\_\_\_\_ii. Barrel Cover
    - \_\_\_\_\_iii. High Pressure Air tanks (HPA)
    - \_\_\_\_\_iv. Carbon dioxide (CO2) Cartridge
  - \_\_\_\_\_j. Explain and demonstrate how to clear a jammed paintball
  - \_\_\_\_\_k. Describe when a Paintball should NOT be used and list 4 examples.
- \_\_\_\_\_4. Do the following to prepare to *Be Responsible, Respect Your Community, Obey the Law*.

- \_\_\_\_\_a. Read the laws in your state for the purchase of Airsoft guns and regulations for their use in your community. Then do the following:
  - \_\_\_\_\_i. List at least three criteria required for paintball marker purchases (example, be 18 years old), list the code citation for your state if applicable.
  - \_\_\_\_\_ii. List at least two laws governing Paintball play in the Community. (Example, play at commercial facility)
- \_\_\_\_\_b. Describe how you should respond if approached by a law enforcement officer during Paintball play.
- \_\_\_\_\_c. Describe how you should respond if a neighbor asks you to stop playing in your neighborhood.
- \_\_\_\_\_5. For each of the following game scenarios, participate in a game scenario and rules orientation and then play the game scenario:
  - \_\_\_\_\_a. Capture the Flag
  - \_\_\_\_\_b. Escort Mission
  - \_\_\_\_\_c. Death Match
  - \_\_\_\_\_d. Deliver the Package
  - \_\_\_\_\_e. Medical Mission

**Do Three of the following optional requirements (6-11)**

- \_\_\_\_\_6. Describe Blind Fire; when it should and should not be used; and why it is not permitted at some commercial paintball facilities.
- \_\_\_\_\_7. Explain the differences between and the uses and benefits for the following:
  - \_\_\_\_\_a. MagFed markers (i.e. Tippmann US Army Marker or TCR MagFed Markers – Rifle/Pistol)
  - \_\_\_\_\_b. Gravity or electric fed hopper markers (CO<sub>2</sub>/HPA)
  - \_\_\_\_\_c. Air driven hopper configured markers (CO<sub>2</sub>/HPA)
- \_\_\_\_\_8. Explain the difference between a tight bore barrel, a standard barrel, and a sniper barrel. Describe how each of these impact performance.
- \_\_\_\_\_9. **Explain what a paintball's "caliber" is and show how to ensure you have the correct caliber paintball for a tight bore barrel, a standard barrel, and a sniper barrel**

\_\_\_\_10. Describe and demonstrate how to safely clean and maintain a paintball marker

\_\_\_\_11. Design your own game, including the following parameters:

\_\_\_\_a. Format: indoor or outdoor

\_\_\_\_b. Type of game or scenario

\_\_\_\_c. Field layout design including designated safe zones

\_\_\_\_d. Game rules (All safety guides must be considered) including: game duration, respawn rules (if any respawns), and how to win.

**For Recommended Resources: See the Shooting Sports Supplement**

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## Pet Care

Name \_\_\_\_\_

Caring for a pet requires taking responsibility for another living thing. Some pets require a lot more time, energy, and money than others. Some require a lot of love and attention. Whichever animal you choose, a pet can bring you years of fun and enjoyment.

### Do all of the following requirements (1-6)

- \_\_\_\_\_ 1. Select a pet to care for. It may be one of your pets or the pet of a friend or relative.
- \_\_\_\_\_ 2. Describe proper safety precautions for handling pets and encountering unfamiliar animals including hand washing and first aid for bites and scratches.
- \_\_\_\_\_ 3. Make a one-month pet care chart listing all the required care for you give to your pet including feeding, cleaning, exercising, medicines, and housing needs. Then provide all the care for your pet for at least one month.
- \_\_\_\_\_ 4. List the key pet laws in your community including:
  - \_\_\_\_\_ a. What animals may be kept as pets and how many are allowed
  - \_\_\_\_\_ b. License and leash laws
  - \_\_\_\_\_ c. Laws against cruelty to animals
  - \_\_\_\_\_ d. Any laws specific to your pet.
- \_\_\_\_\_ 5. Make an expense budget for your pet including costs for:
  - \_\_\_\_\_ a. Food, leashes, bowls, toys, cleaning /grooming products, and medicine
  - \_\_\_\_\_ b. Cost of cages, aquariums, crates, or other housing items
  - \_\_\_\_\_ c. Vet visits and required shots
- \_\_\_\_\_ 6. Identify at least two diseases that your pet can get and spread, such as Lyme disease and rabies and do the following:
  - \_\_\_\_\_ a. Describe what is being done to control these diseases.
  - \_\_\_\_\_ b. Explain what you can do to prevent your pet from getting these diseases.
  - \_\_\_\_\_ c. Explain what to do if you suspect an animal is infected with rabies.

## Do three of the following optional requirements from any topic (7-19)

- \_\_\_\_\_ 7. List the food preferences and nutritional needs for your pet.
- \_\_\_\_\_ 8. Train your pet in three or more tricks or special abilities.
- \_\_\_\_\_ 9. Visit a dog show and do part a and part b or c:
  - \_\_\_\_\_ a. Define the terms "pedigree" and "purebred."
  - \_\_\_\_\_ b. Obtain a list of the criteria for a "purebred" and explain it.
  - \_\_\_\_\_ c. Obtain the criteria for judging three different breeds of dogs
- \_\_\_\_\_ 10. Learn how to keep baby fish alive in an aquarium and get the extra equipment required. Then breed some fish.
- \_\_\_\_\_ 11. Make a one-month pet care chart listing all the required care for you to give to a second different kind of pet including feeding, cleaning, exercising, medicines, and housing needs. Then provide all the pet care for that pet for at least one month.
- \_\_\_\_\_ 12. Care for the pet of a neighbor, friend, or relative while they are away for a weekend.
- \_\_\_\_\_ 13. Help a neighbor, friend, or relative care for their pet by doing tasks for them such as taking their dog for a walk, giving their pet a bath, or cleaning their pet's cage(s).
- \_\_\_\_\_ 14. Find a place in your community to do volunteer work with animals such as the Humane Society, a local animal shelter, the SPCA, or an animal clinic and volunteer for at least 5 hours.
- \_\_\_\_\_ 15. Tell a younger Unit or Patrol about your pet and the local laws governing your pet using a visual presentation (board, PowerPoint, or movie) and if appropriate show them your pet. The visual presentation may include: a picture of your pet and information such as name, age, size, gender, breed or kind, special characteristics, abilities, how you got your pet, or a special story about it.
- \_\_\_\_\_ 16. Visit a veterinary hospital, dog training facility, or animal shelter in your area. Explain what they do there and list the kinds of animals they specialize in.
- \_\_\_\_\_ 17. Dogs are sometimes trained for certain jobs such working with persons with disabilities, search and rescue, and with law or drug enforcement. Visit someone who trains service dogs and find out how they do it or how the dog is used to assist its owner. Find out the following:
  - \_\_\_\_\_ a. Are there certain breeds that are best for this training?
  - \_\_\_\_\_ b. How long does their training take?
  - \_\_\_\_\_ c. Is it expensive?
  - \_\_\_\_\_ d. What qualifications or education do you need for a career in this field?



\_\_\_\_\_18. Visit a person in your community who has a career dealing with pets at their workplace and discuss his work with him.

\_\_\_\_\_19. Invite a person in your community who has a career dealing with pets to come and talk about the work he does at a troop meeting.

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# Photography

Name \_\_\_\_\_

## Do all of the following requirements (1-2)

- \_\_\_\_\_1. Explain and show examples of at least five basic rules of composition such as: rule of thirds, framing, horizontal and vertical lines, looking into the frame, leading lines, patterns and textures, backgrounds, and depth.
- \_\_\_\_\_2. Do the following to learn about settings that you can either select or let a camera make automatically:
- \_\_\_\_\_a. ISO setting or film speed is a measure of sensitivity to light and is rated in 100s. A higher ISO allows use of faster shutter speeds or smaller apertures. Describe the negative impact of using too high an ISO setting or film speed.
- \_\_\_\_\_b. Aperture is measured in f-stops (smaller f-stop means larger aperture and vice versa). List situations where you would want a smaller or larger f-stop.
- \_\_\_\_\_c. Shutter speed measured in fractions of a second. List situations where you would want a faster or slower shutter speed.
- \_\_\_\_\_d. Explain how ISO setting (film speed), aperture f-stop, and shutter speed work together.
- \_\_\_\_\_e. Explain which settings of ISO setting (film speed), aperture f-stop, and shutter speed would be good choices for the following situations:
- Sunny day
  - Cloudy day
  - Action shot
  - Landscape or scenic shot

- Close-up shot

\_\_\_\_\_f. The color setting on some cameras allows you to select color, black and white, and perhaps other constrained color palettes. List situations where using black and white instead of color would be a good choice.

**Do eight of the following requirements with at least one from each topic (3-19)**

### **Taking Photographs**

- \_\_\_\_\_3. Plan and photograph a Troop, Unit, patrol, or family event. The plan should include lighting, camera settings, and composition rules.
- \_\_\_\_\_4. Using a tripod and camera with a timer delay, set up a photo shoot for your Troop, Unit, or patrol. Do the following:
- \_\_\_\_\_a. Create or select a backdrop or background scene; choose some props; and select the Troop, Travel, or Trail uniform for the pictures.
  - \_\_\_\_\_b. Take a picture of each Trailman, including you, in his uniform.
  - \_\_\_\_\_c. Take a picture of your whole Troop, Unit, or patrol including you.
- \_\_\_\_\_5. **Take a set of photos demonstrating the five lines of the Trailman's Oath and how your Troop implements them.**
- \_\_\_\_\_6. Take a still-life photograph using natural light. Do the following:
- \_\_\_\_\_a. Set your scene outdoors, arranging a pleasing composition.
  - \_\_\_\_\_b. Photograph your scene at various times of the day, from three different viewpoints each time.
  - \_\_\_\_\_c. Describe how the position of the light source (in this case, the sun) affects the mood of the photograph (creating bright or muted highlights, varying lengths of shadows, harsh or soft overall feeling of photo, etc.).

### **Displaying Photographs**

In this topic, you will be using the photographs taken in requirements 3 through 6 for display.

- \_\_\_\_\_7. Put together a bulletin board or photo album of your photos and display them at a Troop meeting or event.

- \_\_\_\_\_8. Display some photos at a fair or photo exhibit.
- \_\_\_\_\_9. Print one of your photos on special craft fabric designed for photos to display your photo on a T-shirt, book cover, or other project.
- \_\_\_\_\_10. Make a computer photo slide show of your photos or a themed subset of your photos. Add captions to at least three photos. Show the slide show at a Troop meeting or event.

### **Equipment and Processing**

- \_\_\_\_\_11. Research the different types of digital cameras.
  - \_\_\_\_\_a. List the features you get for your money and compare models and prices.
  - \_\_\_\_\_b. Highlight the features needed for your photography interests.
- \_\_\_\_\_12. Watch a demonstration of darkroom processing live or recorded. Do the following.
  - \_\_\_\_\_a. Describe darkroom film processing.
  - \_\_\_\_\_b. Explain the dangers associated with darkroom printing.
- \_\_\_\_\_13. Experiment with a photo-editing software package. Do the following:
  - \_\_\_\_\_a. Explain how cropping, clearing red-eye, and deleting undesirable background objects improve photos.
  - \_\_\_\_\_b. List situations when changing photos in this way could be unethical.
  - \_\_\_\_\_c. Demonstrate cropping, clearing red-eye, and deleting undesirable background objects.
- \_\_\_\_\_14. Take a physical or virtual visit to a photo center with your Troop, Unit, patrol, or family. Do the following:
  - \_\_\_\_\_a. Explain the services offered and how photo printing is done.
  - \_\_\_\_\_b. Order additional prints from your negatives, memory card, or digital photo library.
  - \_\_\_\_\_c. On your computer or the photo center website, edit a set of photos to include a frame and a caption on at least one picture. Insert the photos into a photobook.

- \_\_\_\_\_d. Either print the photo-book or show an electronic copy to your Mentor.
- \_\_\_\_\_15. Lighting is an important element for every picture. Take a field trip to a photography studio look at the different types of lights and lighting accessories that the photographer uses.
- \_\_\_\_\_a. Discuss how artificial lighting can be used to enhance photography.
- \_\_\_\_\_b. Describe when you would need more or less light
- \_\_\_\_\_c. Experiment by using a camera with a separate flash Unit (or a built-in flash which you can turn on and off) in different lighting situations.

### Careers and Service

- \_\_\_\_\_16. Photography is used in many fields. Interview a professional photographer to find out what steps he took to prepare for this career.
- \_\_\_\_\_17. Many people have had an impact on the history of photography. Research the contributions of two people and how they have furthered a technological or artistic aspect of photography.
- \_\_\_\_\_18. Visit a photo gallery or exhibit with your Troop or family.
- \_\_\_\_\_a. Notice how the lighting affects the mood of a photograph.
- \_\_\_\_\_b. Select your favorite photo and describe the lighting and how it makes you feel
- \_\_\_\_\_19. Volunteer to photograph a Sunday school class or residents at a nursing home. Print their portraits to be used in a holiday craft or home directory.

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# Pistol



Name \_\_\_\_\_

All Pistol activities must be done under the safety requirements of the *Trail Life USA Health and Safety Guide* and the *Shooting Sports Guidebook*.

For working on this badge, select either a semi-automatic (hammer fired or striker fired) or a revolver (single or double action).

## Do all of the following requirements (1-4)

- \_\_\_\_1. Complete the Navigator or Adventurer Shooting Sports Orientation.
- \_\_\_\_2. Participate in a pistol orientation that covers the following:
  - \_\_\_\_a. Four popular pistol calibers and how to determine what caliber of ammunition is to be used for a given pistol.
  - \_\_\_\_b. Describe the parts of and the differences between a center-fired cartridge and a rim-fired cartridge.
  - \_\_\_\_c. How to use pistol sights (Iron and Scoped sights) and how align the sights to a target.
  - \_\_\_\_d. Demonstrate how to take down a pistol and name its parts (seven parts for a semi-automatic or six parts for a revolver).
- \_\_\_\_3. Participate in a pistol safety orientation that includes the Trailman doing the following:
  - \_\_\_\_a. Recite from memory the three rules of the *Gold Standard in Gun Safety* guidelines in the Shooting Sports Guidebook or Shooting Sports Supplement.
  - \_\_\_\_b. Explain the Rules for Safe Pistol Use and Storage.
  - \_\_\_\_c. Describe or demonstrate the common Range Commands.
  - \_\_\_\_d. List the proper safety gear for pistol shooting
  - \_\_\_\_e. Describe how to safely verify whether a pistol is loaded or unloaded.
  - \_\_\_\_f. Describe how to safely pick up a pistol and carry it from one place to another.
  - \_\_\_\_g. Demonstrate how to properly transport a pistol and ammunition.

- \_\_\_\_\_h. Demonstrate how to properly clear a Type 1 and Type 2 jam using Snap Cap training rounds or qualified dummy rounds in a Pistol.
- \_\_\_\_\_i. Demonstrate how to safely Load, Unload, and CLEAR a Pistol using Snap Cap training rounds or qualified dummy rounds.
- \_\_\_\_\_4. Under qualified adult supervision, participate in a pistol shooting skill orientation that includes the Trailman doing the following:
  - \_\_\_\_\_a. Using a pistol, demonstrate the three rules of the *Gold Standard in Gun Safety* guidelines in the Shooting Sports Guidebook or Shooting Sports Supplement.
  - \_\_\_\_\_b. Demonstrate how to safely verify whether a pistol is loaded or unloaded.
  - \_\_\_\_\_c. Demonstrate how to safely pick up a pistol and carry it from one place to another.
  - \_\_\_\_\_d. demonstrate the five fundamentals of shooting:
    - \_\_\_\_\_i. Aiming
    - \_\_\_\_\_ii. Breath Control
    - \_\_\_\_\_iii. Grip and Hold Control
    - \_\_\_\_\_iv. Trigger Control
    - \_\_\_\_\_v. Follow Through
  - \_\_\_\_\_e. Using the benchrest or basic supported while seated position, shoot at least 75 rounds using a target and range distance selected by the Mentor or Instructor.
  - \_\_\_\_\_f. Demonstrate how to safely and properly clean a pistol after use.

**Do Three of the following optional requirements (5-12)**

- \_\_\_\_\_5. Using the basic supported while standing position, shoot at least 75 rounds at each of three distances (e.g. 7, 15, and 25 yards).
- \_\_\_\_\_6. Try out the various one and two handed standing shooting positions. Using your favorite standing position, shoot at least 75 rounds at each of three distances (e.g. 7, 15, and 25 yards).
- \_\_\_\_\_7. Play one or more shooting range games that involves shooting a total of at least 100 pistol rounds for each participant. Some example games are listed in the Shooting Sports Supplement.



- \_\_\_\_\_8. Create your own shooting gallery of targets and run through the Gallery at least three times to shoot at least 75 rounds per shooter (See Shooting Sports Supplement).
- \_\_\_\_\_9. Participate in shooting sampler day and shoot at least 3 different pistol types (e.g. TLUSA Recoil Rally in Georgia).
- \_\_\_\_\_10. Complete the NRA Basic Pistol course.
- \_\_\_\_\_11. Earn a Pro-marksman or higher Winchester/NRA Marksmanship Qualification in any Pistol discipline.
- \_\_\_\_\_12. Participate in a pistol clinic or competition sanctioned by Civilian Marksmanship Program (CMP), National Rifle Association (NRA), National Shooting Sports Foundation (NSSF), or USA Shooting.

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# Puppetry

Name \_\_\_\_\_

Do all of the following requirements (1-8)

- \_\_\_\_\_1. Learn about and be able to identify these forms of puppetry: finger, stick, glove or hand puppets, and marionettes.
- \_\_\_\_\_2. **Attend a puppet show or watch one on the Internet with your parent's approval.**
- \_\_\_\_\_3. Learn about shadow puppets. Research how to make a shadow box stage including recommended dimensions for a shadow box stage.
- \_\_\_\_\_4. Marionettes are like puppets but use strings to move. Look at several different sizes, styles and ages of marionettes. Explain how they are different.
- \_\_\_\_\_5. Investigate the role of puppetry in one other culture. Some examples are Scandinavian black or Vietnamese water puppetry. Explain how this form of puppetry is performed in that culture, its history, and its puppets.
- \_\_\_\_\_6. Using what you have learned about different types of puppets, select one of the styles you like and make a new puppet or borrow one.
- \_\_\_\_\_7. Practice and demonstrate talking with a puppet in the following ways:
  - \_\_\_\_\_a. Showing the following four emotions: surprise, excitement, sadness, and fear
  - \_\_\_\_\_b. Using voices in three different pitches: a high, middle and low voice
  - \_\_\_\_\_c. Using two different kinds of accents
  - \_\_\_\_\_d. Using two different vocal patterns: very slow with drawn out words and rapid-fire quick speech

- \_\_\_\_\_ 8. Select one of Aesop's fables or a Bible story. Write your script and practice your delivery. You may work together with others. Present your puppet show to an audience.

**Do one of the following optional requirements (9-16)**

- \_\_\_\_\_ 9. Attend a puppet show. Go backstage and see how the puppeteers operate the puppets, scenery and props.
- \_\_\_\_\_ 10. Assist with a puppet theater production. Assume responsibility for some aspect such as writing, production, technical crew, puppets and props, or publicity.
- \_\_\_\_\_ 11. Perform a shadow-puppet play for younger children.
- \_\_\_\_\_ 12. Get involved in a puppet ministry for a period of at least two months. Keep a list of the different characters you portrayed, the stories or themes you developed, and any memorable audience reactions, etc. Explain your conclusions about the effectiveness of puppetry to communicate your intended message.
- \_\_\_\_\_ 13. Research a famous puppeteer and his contributions to the art of puppetry. Prepare a video, oral report, talk show, or game show to demonstrate what you have discovered, including information on education, training, techniques, and contributions to puppetry.
- \_\_\_\_\_ 14. Puppets are used for more than entertainment purposes. They can be used for therapy or as teaching tools on a variety of topics. For example, the Red Cross uses puppets to teach children about emergency preparedness. Invite someone who uses puppets in his career field or ministry to come and speak to your Troop or Unit.
- \_\_\_\_\_ 15. Invite a puppeteer to talk with your Troop or Unit about his craft.
- \_\_\_\_\_ a. Prepare and ask your guest speaker questions, including the following:
- Do you make your own puppets?
  - How long does it take to make a puppet?
  - How did you learn to be a puppeteer?
  - Do you work with different styles of puppets?
  - What is the most interesting prop you have used in a show?

\_\_\_\_\_b. Explain to your Mentor what you learned from the puppeteer.

\_\_\_\_\_16. Lead a service project with your Troop, Unit or family to hold a puppet making session at a preschool, daycare, mental health center, local mission, or other service-oriented organization. Planning considerations include:

- Determine if there are any specific types or designs of puppets they prefer.
- Puppets for use by small children should not contain small pieces that could come off easily.
- Look for appropriate puppet designs in craft books, or on the Internet.

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**TRAIL  
LIFE  
USA**

## Reading

*The goal of this Trail Badge is reading as an enjoyable past time. You read as part of school, but reading is an enjoyable hobby too. If reading is challenging for you, please use audio books, electronic readers, or someone reading aloud to you. A book listened to can open exciting new doors just the same as one that is read.*

Name \_\_\_\_\_

Book and Activity Selections: All books and activities must be preapproved as by the Trail Badge Mentor and your parents as not containing objectionable material. Otherwise, you are free to select books from any genre(s) you wish even if all of them are from the same genre or book series. You may also select specific books of the Bible. See guidelines in Literary Genres of the Bible section below.

### Do one of the following book access requirements (1-3)

- \_\_\_\_1. Visit your local library and do the following:
  - \_\_\_\_a. Apply for a library card if you do not already have one.
  - \_\_\_\_b. Demonstrate how to locate books by one of your favorite authors or about an interesting subject, using the catalogue system.
  - \_\_\_\_c. Check out a book.
  - \_\_\_\_d. Reserve a book from your local library that is currently checked out.
  - \_\_\_\_e. Request a book from a different library branch.
- \_\_\_\_2. Using your preferred provider of downloadable books, demonstrate:
  - \_\_\_\_a. Searching for a book by author, title, and subject.
  - \_\_\_\_b. Purchasing or borrowing a downloadable book and loading it into your device.
- \_\_\_\_3. Using your preferred provider of audio books, demonstrate:
  - \_\_\_\_a. Searching for a book by author, title, and subject.
  - \_\_\_\_b. Purchasing or borrowing an audio book and listening to it.

### Do the following core requirements (4-7)

- \_\_\_\_4. Discuss with your parents and Mentor how to evaluate if a book you are interested in is worthy of a read. Use the criteria discussed to evaluate your selections for this badge.
- \_\_\_\_5. Read six books that you are not reading for school or any other purpose or award. List the title and author of each for your Mentor (written or oral).
- \_\_\_\_6. Select one of the books read for requirement 5 and do one of the following reading comprehension activities.

- \_\_\_\_\_a. Do a written or oral book report for your Mentor that includes the title, author, and a brief plot summary.
  - \_\_\_\_\_b. Write a book review for your Mentor.
  - \_\_\_\_\_c. Lead a book discussion on that book with at least two others who have read it and your Mentor.
  - \_\_\_\_\_d. With prior approval of your Mentor and parents, participate in a group Bible study on the Book(s) of the Bible you read.
  - \_\_\_\_\_e. Create and give a presentation to your Mentor on the book you selected.
  - \_\_\_\_\_f. Demonstrate to your Mentor one or more techniques or activities central to the story in the book. (Example: How to use a sextant for *Carry On Mr. Bowditch*)
- \_\_\_\_\_7. Repeat requirement 6 with a second book read for requirement 5.

Do two of the following optional requirements from any topic (8-18)

#### Additional Reading Fun

- \_\_\_\_\_8. If approved by your Mentor and parents, see the movie made for one of the books you read and explain the similarities and differences between the book and the movie to your Mentor.
- \_\_\_\_\_9. **Write and illustrate a children's book** for a child you know. After approval by the child's or children's parents, and under an adult's guidance, read the book to the child or children.
- \_\_\_\_\_10. Just for fun, select any additional book that you are not reading for school or any other purpose or award and read it solely for your own enjoyment. List only the title and author of the book for your Mentor (written or oral).
- \_\_\_\_\_11. **With your parents' and Mentor's approval, select a new magazine that you would like to read.** Buy or borrow a copy and read two issues. Show them to your Mentor and describe one new thing you learned.

#### Careers and Authors

- \_\_\_\_\_12. Interview the librarian at your school or local library. Describe what you learned. See the *Sample Interview Questions* section below.
- \_\_\_\_\_13. Interview someone who has a career as an author, writer, illustrator, or publisher. Describe what you learned. See the *Sample Interview Questions* section below.
- \_\_\_\_\_14. Attend an author talk and book signing at a local bookstore or library. Keep notes. Describe what you learned. See the *Sample Interview Questions* section below.
- \_\_\_\_\_15. Send an email or note to an author of a book you have read, sharing your thoughts about the book.



## Service

- \_\_\_\_\_16. Host a book drive to collect books to donate to a shelter, nursing home, or missionary or other organization. The announcement should tell people what types of books you are collecting and what age reader will receive them.
- \_\_\_\_\_17. **Under an adult's guidance, read several books to young children. Practice your delivery and voice inflections to make it more interesting.**
- \_\_\_\_\_18. **Under an adult's guidance, read a book to a senior citizen who may be having visual difficulties. Let the senior pick a book that interests him or her.**

## Resources

### Sample Interview Questions

This is a starter list of questions you might ask. You can use any of these, but be sure to come up with some questions that interest you.

- a. How did you become interested in books?
- b. How long have you worked at the library, or as an author?
- c. What are your favorite and least favorite parts of your profession?
- d. How did you get started?
- e. What type of education is required?
- f. What are the new technologies in book publishing and libraries?

### Literary Genres of the Bible

In addition to being the Word of God, the Bible is also a collection of great literature worthy of being read by everyone. It uses a variety of genres or literary styles summarized below in four genres. For the shorter Minor Prophets and Epistles Books, select several so you have at least 20 – 30 chapters to read. Read from a Biblical translation that your parents and Mentor approve.

- **Narrative Writing and History** includes Genesis, Exodus, Numbers, Joshua, Judges, 1 & 2 Samuel, 1 & 2 Kings, 1 & 2 Chronicles, Ruth, Ezra, Nehemiah, Daniel, Jonah, Haggai, some of the Prophetic writings, the Gospels, and Acts.
- **Epistles** (New Testament) include the Letters of Paul (Romans to Philemon) and general letters (Hebrews to Jude).
- **Prophets and the Prophetic Writings** include the Major Prophets (Isaiah, Jeremiah, Lamentations, Ezekiel, and Daniel), the Minor Prophets (Hosea to Micah), and Revelation.
- **Wisdom Literature** includes Job, Psalms, Proverbs, Ecclesiastes, and Song of Solomon.

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## Respect Life

*A Christian worldview values all of human life: men and women; boys and girls; babies and the elderly, sick and healthy, special needs children and adults, etc. How does God see babies before they are born? How does God see the elderly, special needs, the sick and the poor? What does he want us to do? God has much to say in answer to these questions so we turn to the Bible for guidance.*

Name \_\_\_\_\_

Do all of the following requirements (1-2)

- \_\_\_\_1. Look up the words abortion, infanticide, and euthanasia in a dictionary. Explain their meanings in your own words.
- \_\_\_\_2. Explain how each of these Scriptures reflects your opinion of abortion, infanticide, and euthanasia.
  - \_\_\_\_a. Genesis 1
  - \_\_\_\_b. Leviticus 19:32
  - \_\_\_\_c. Isaiah 64:8
  - \_\_\_\_d. Psalm 139:13-14
  - \_\_\_\_e. Proverbs 16:31
  - \_\_\_\_f. Luke 14:12-14
  - \_\_\_\_g. Luke 18:15-17
  - \_\_\_\_h. Exodus 20:13
  - \_\_\_\_i. Micah 6:8
  - \_\_\_\_j. James 1:27

Choose one (1) of the following eight (8) options (3-10):

- \_\_\_\_3. Watch the documentary, *180* by Ray Comfort (<http://www.180movie.com/>) and explain what you learned from the film.
- \_\_\_\_4. Explain how these additional Scriptures reflect your opinion of abortion, infanticide, and euthanasia.
  - \_\_\_\_a. Job 33: 4

- \_\_\_\_\_b. Psalm 127:3-5
  - \_\_\_\_\_c. Read Luke 1:26-56
  - \_\_\_\_\_d. John 16:21
  - \_\_\_\_\_e. Exodus 21:12
  - \_\_\_\_\_f. Psalm 72
  - \_\_\_\_\_g. Zechariah 7:9-10
  - \_\_\_\_\_h. I Timothy 5:1-2
- \_\_\_\_\_5. **Research how early Christians combatted what was a normal practice of infanticide in ancient Rome and where infanticide is practiced in the world today. Explain how modern Christians can address this issue.**
  - \_\_\_\_\_6. Research where assisted suicide is legal in the United States and around the world. Discuss with your parents or mentor this form of euthanasia and formulate a Christian response to its supporters.
  - \_\_\_\_\_7. Learn about George Whitfield and how he cared for orphans **with God's faithful** provision. Explain how modern Christians can address orphan care.
  - \_\_\_\_\_8. Research how Mother Theresa cared for the poor of Calcutta. Explain ways in which Christians can care for the poor and sick.
  - \_\_\_\_\_9. Research what the Bible **says about a man's responsibility to protect the lives of those in his care. Explain some modern day threats to a man's family** he needs to consider and ways to mitigate those threats.
  - \_\_\_\_\_10. Research and explain the frequency and types of domestic abuse and how the church can help protect victims of domestic abuse.

**Choose two (2) of the following thirteen (13) options (11-23):**

- \_\_\_\_\_11. Participate in an awareness event for pro-life issues in your area.
- \_\_\_\_\_12. Volunteer to serve at the Crisis Pregnancy Center
- \_\_\_\_\_13. Research three Crisis Pregnancy Centers or Pro Life organizations and explain what they do.

- \_\_\_\_\_14. Organize a service project for your patrol or Troop at a local Crisis Pregnancy Center or Pro-Life Organization.
- \_\_\_\_\_15. Lead a Gift Bundle collection for babies through your Troop or Charter Organization for a Crisis Pregnancy Center. A gift bundle would be small baskets of baby clothes, toys, diapers, etc.
- \_\_\_\_\_16. Conduct a fundraising Baby Bottle Drive at your Charter Organization.
- \_\_\_\_\_17. Volunteer at a domestic abuse shelter or organize a supply drive for a domestic abuse shelter.
- \_\_\_\_\_18. With your mentor, plan a Respect Life Troop meeting where you present what you have learned.
- \_\_\_\_\_19. Volunteer at a local Assisted Living/Skilled Nursing community.
- \_\_\_\_\_20. Organize a service project at a local assisted living/skilled nursing community.
- \_\_\_\_\_21. Volunteer at your local Special Olympics program.
- \_\_\_\_\_22. Organize a service project for your patrol or Troop at a local Special Olympics event.
- \_\_\_\_\_23. **Write a letter to your district's U.S. Representative and two U.S Senators** sharing what you learned completing this badge and your opinion on this issue.

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## Rifle



Name \_\_\_\_\_

All Rifle activities must be done under the safety requirements of the *Trail Life USA Health and Safety Guide* and the *Shooting Sports Guidebook*.

### Do all of the following requirements (1-4)

- \_\_\_\_1. Complete the Navigator or Adventurer Shooting Sports Orientation.
- \_\_\_\_2. Participate in a Rifle orientation that covers the following:
  - \_\_\_\_a. Four parts of a rifle stock
  - \_\_\_\_b. Seven parts of a rifle action
  - \_\_\_\_c. Five parts of a rifle barrel
  - \_\_\_\_d. Six popular types of rifle actions
  - \_\_\_\_e. Three types of sights and their uses
  - \_\_\_\_f. **A rifle's caliber and how to select the correct caliber ammunition for a particular rifle**
- \_\_\_\_3. Participate in a rifle safety orientation that includes the Trailman doing the following:
  - \_\_\_\_a. Recite from memory the three rules of the *Gold Standard in Gun Safety* guidelines in the Shooting Sports Guidebook or Shooting Sports Supplement.
  - \_\_\_\_b. Explain the Rules for Safe Gun Use and Storage.
  - \_\_\_\_c. Describe or demonstrate the common Range Commands.
  - \_\_\_\_d. List the proper safety gear for rifle shooting.
  - \_\_\_\_e. Describe how to safely verify whether a rifle is loaded or unloaded.
  - \_\_\_\_f. Describe how to safely pick up a rifle and carry it from one place to another.
  - \_\_\_\_g. Describe how to detect each of the following types of cartridge malfunctions, and explain the appropriate action for each type:
    - \_\_\_\_i. Misfire
    - \_\_\_\_ii. Hangfire
    - \_\_\_\_iii. Squib Load

- \_\_\_\_\_4. Under qualified adult supervision, participate in a rifle shooting skill orientation that includes the Trailman doing the following:
- \_\_\_\_\_a. Using a rifle, demonstrate the three rules of the Gold Standard in Gun Safety guidelines in the Shooting Sports Guidebook or Shooting Sports Supplement.
  - \_\_\_\_\_b. Demonstrate how to safely verify whether a rifle is loaded or unloaded.
  - \_\_\_\_\_c. Demonstrate how to safely pick up a rifle and carry it from one place to another.
  - \_\_\_\_\_d. Demonstrate the five fundamentals of shooting:
    - \_\_\_\_\_i. Aiming
    - \_\_\_\_\_ii. Breath Control
    - \_\_\_\_\_iii. Hold Control
    - \_\_\_\_\_iv. Trigger Control
    - \_\_\_\_\_v. Follow Through
  - \_\_\_\_\_e. Shoot a total of at least 100 rounds of ammunition and correctly using at least two of the five positions: Benchrest, Prone, Sitting, Kneeling, or Standing.
  - \_\_\_\_\_f. Demonstrate how to safely and properly clean a rifle after use

**Do Three of the following optional requirements (5-15)**

- \_\_\_\_\_5. Write a letter to the editor of a local publication explaining your position on gun rights.
- \_\_\_\_\_6. Play one or more shooting range games that involves shooting a total of at least 100 rifle rounds for each participant. Some example games are listed in the Shooting Sports Supplement.
- \_\_\_\_\_7. Participate in a Project Appleseed shooting event.
- \_\_\_\_\_8. Participate in shooting sampler day and shoot at least 3 different rifle types (e.g. TLUSA Recoil Rally in Georgia).
- \_\_\_\_\_9. Complete the NRA Basic Rifle course.
- \_\_\_\_\_10. Earn a Pro-marksman or higher Winchester/NRA Marksmanship Qualification in any Rifle discipline.
- \_\_\_\_\_11. Participate in a rifle clinic or competition sanctioned by Civilian Marksmanship Program (CMP), National Rifle Association (NRA), National Shooting Sports Foundation (NSSF), or USA Shooting.
- \_\_\_\_\_12. With a .22 rimfire or .17 HMR rifle, from a position of your choice, at a distance of 50 feet, fire five 3-shot groups that can be covered with a quarter. The rifle can have either open or aperture sights. The 3-shot groups do not have to be fired on the same day.
- \_\_\_\_\_13. From a bench, sight-in a scoped rifle by adjusting the scope until you can shoot a 1" group of 3 shots at 100 yards (50 yards for a rimfire caliber rifle).



- \_\_\_\_\_14. With a center-fire rifle, from a position of your choice, at a distance of 100 yards or greater, fire 5 one-inch groups of three-shots each.
- \_\_\_\_\_15. With a center-fire rifle, from a position of your choice, at a distance of 400 yards or greater, shoot 5 rounds at a man-size target and hit it at least 4 times. Do this twice.

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# Robotics

Name \_\_\_\_\_

Robotics is technological field focused on the specification, design, implementation, and use of robots. Included in the field are the embedded processors used by the robots for sensing their surroundings, processing signals and data, and controlling the robot. Robots come in many shapes and forms and may have some human characteristics such as limited reasoning, behaviors, or appearance. They are used in a wide variety of applications such as manufacturing, interaction with humans, surgery, bomb disposal, and other applications in environments too harsh for humans.

## Do all of the following requirements (1-2)

\_\_\_\_1. Explain the role of each robotic subsystem listed below and describe three different example subsystems for each subsystem:

\_\_\_\_a. Power

\_\_\_\_b. Actuation

\_\_\_\_c. Sensing

\_\_\_\_d. Manipulation (end effectors)

\_\_\_\_e. Locomotion

\_\_\_\_2. Explain the role of the processing subsystem and do the following:

\_\_\_\_a. Describe three different methods of human robot interaction.

\_\_\_\_b. List three sensors used for robot navigation.

\_\_\_\_c. Explain the levels of autonomy for robot control systems using one of the several current classification conventions.

## Do six requirements (3-17) with at least one Project and two from Technology

### Project (Do at least one)

\_\_\_\_3. Using a robotics kit or system, do the following:

\_\_\_\_a. Define requirements of what you want your robot to do.

- \_\_\_\_\_b. Design the robot by making configuration sketch or list for the robot kit components and a list of steps for the program to do.
  - \_\_\_\_\_c. Build and program the robot.
  - \_\_\_\_\_d. Test the robot to verify that it meets the specified requirements.
  - \_\_\_\_\_e. Demonstrate the working robot for your Mentor.
- \_\_\_\_\_4. Participate in an after school robotics program or competitive league for a season or school year and report to your Mentor what robotics activities you participated in.
  - \_\_\_\_\_5. Using an Arduino microcontroller, make robotics project of your choice that is approved by your mentor.

### Technology (Do at least two)

- \_\_\_\_\_6. Explain what is meant by robotics degrees of freedom. Research and prepare a presentation explaining two different robot arms. Give examples of where the types are used and include pictures.
- \_\_\_\_\_7. Research and explain the seven degrees of freedom of the human arm. Teach a younger Unit or Patrol how to distinguish each of the yaw, pitch, and roll degrees of freedoms and which of those each joint in the arm has.
- \_\_\_\_\_8. One type of end effector for the manipulation subsystem is a robotic gripper. Define the four types listed below and show an example for each kind including a picture and description of operation for each.
  - \_\_\_\_\_a. Impactive
  - \_\_\_\_\_b. Ingressive
  - \_\_\_\_\_c. Astrictive
  - \_\_\_\_\_d. Contigutive
- \_\_\_\_\_9. Report on five different end effectors for the manipulation subsystem that are not robotic grippers. Show an example for each one including a picture and description of operation.

- \_\_\_\_10. Define artificial intelligence in the context of robotics. Do some research and find out how far we have come in developing artificial intelligence. Explain this to your unit or family.

### Professional Activities

- \_\_\_\_11. Attend a robotics competition or trade show. Report on what you learned.
- \_\_\_\_12. Visit a factory that uses robots. Report the following:
- \_\_\_\_a. If the tasks were previously performed by humans
  - \_\_\_\_b. Specific type of each of the five subsystems in the robot (see requirement 1)
  - \_\_\_\_c. Inputs the robot senses
  - \_\_\_\_d. Decisions the robot makes
  - \_\_\_\_e. Actions the robot does
- \_\_\_\_13. Research two famous engineers in robotics and report what engineering degrees these engineers earned, their major accomplishments, and what organizations they led or for which they performed significant engineering.
- \_\_\_\_14. With a parent, attend a meeting of a local professional engineering society in your locality related to robotics. List any scholarships or special opportunities for youth and young engineers that the Society may sponsor.
- \_\_\_\_15. Modern engineering specialties related to robotics include aerospace, biomedical, computer, control systems, electrical, electronics, industrial, mechanical, mining, naval architecture and marine, software, systems, and transportation engineering. Choose two specialties you have not used for another Science and Technology Trail Badge and do the following:
- \_\_\_\_a. Describe what type of work is done in those two engineering specialties and how the work of those two specialties is related.
  - \_\_\_\_b. Choose one specialty, and explain the education, training, and experience required to serve successfully in that profession.

- \_\_\_\_\_16. Note: This requirement is listed in multiple Trail Badges, but may only be used for one Trail Badge. Explain what it means to be an Engineer Intern and a Licensed Professional Engineer. List the requirements to become a Licensed Professional Engineer in your state.
- \_\_\_\_\_17. Note: This requirement is listed in multiple Trail Badges, but may only be used for one Trail Badge. Read the Code of Ethics or Professional Conduct for Professional Engineers for your state (or NSPE Code of Ethics for Engineers if your state does not have one). One role of the engineer is providing society with accurate facts in order to make the best possible decisions.
- \_\_\_\_\_a. Explain how the code you read relates to the Trailman Oath and good stewardship.
- \_\_\_\_\_b. List possible consequences to the public if an engineer does not follow this Code.

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## Running Sports

Name \_\_\_\_\_

- \_\_\_\_1. Do the following to learn about running and track and field:
  - \_\_\_\_a. Explain the importance of warming up and stretching before you run and cooling down and stretching after you run.
  - \_\_\_\_b. Explain the importance of pacing, consistency, and hydration, and give an example of each.
  - \_\_\_\_c. List at least five safety rules to follow while running.
  - \_\_\_\_d. Describe the following types of running: jogging, track, cross-country, and marathon.
  - \_\_\_\_e. Describe the proper clothing and footwear to wear when running.
- \_\_\_\_2. Do two of the following:
  - \_\_\_\_a. Explain the track and field competitions.
  - \_\_\_\_b. Attend or watch a high school, college, or benefit race or marathon.
  - \_\_\_\_c. Attend or watch a high school, college, or international track and field meet.
  - \_\_\_\_d. Read a biography of a famous runner or track and field competitor.
  - \_\_\_\_e. Start with a distance of a quarter to a half a mile, and practice running at least twice a week to gradually build your endurance to at least 30 minutes, five km, or three miles continuous running.
- \_\_\_\_3. Over a period of at least six weeks, participate in at least eighteen practice sessions on different days where a session can be any of the following:
  - \_\_\_\_a. Team practice for an organized track and field team
  - \_\_\_\_b. A professionally coached track and field skills session, lesson, or class

\_\_\_\_\_c. Running practice of least 30 minutes, five km, or three miles continuous running with a warm-up and stretch before running and a cool down and stretch after running

\_\_\_\_\_4. Participate in at least two competitions of any of the following types

- Track and field meets in which you race in at least one running event
- Any distance races of at least five km

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USA**

## Sewing for Adventure

*In centuries past, sewing was not a hobby but a basic skill. Men of many different cultures sewed to meet their needs or as part of their trade. They would sew cloth, canvas, and even leather. In the military, soldiers were issued sewing repair kits and expected to maintain their own clothes and gear.*

*Today many men use sewing to create outdoor gear such as stuff bags, tarps, tents, backpacks and more. Some sew gear because they can make an item for cheaper than they can buy it ready-made. Some sew because they need a custom size or want a custom feature on their gear. Many people make their own gear in order to make it ultra lightweight. Others sew gear because they are designing something new or just for the fun of doing it.*

*This badge focuses on basic sewing knowledge and skills so you can attach your own Trail Life USA patches and repair your gear in the backcountry and at home. You will do one simple sewing project and can choose three more things to do from the optional projects, repairs, or career explorations.*

Name \_\_\_\_\_

Do all of the following requirements (1-3)

- \_\_\_\_1. Participate in a sewing orientation covering the following:
  - \_\_\_\_a. Tools: measuring tape, marking pencil, pinking shears, patterns, pins, needles, sewing awl (Speedy Stitcher), sail needle, thread, seam ripper, thimble, and bobbins
  - \_\_\_\_b. Notions: elastic, hook and loop fasteners (Velcro), buckles, grommets, buttons, snaps, shock cord, draw cord, cord clasps, closed-cell foam, webbing, and bias tape
  - \_\_\_\_c. Fabrics: woven cotton, cotton flannel, woven polyester, polyester fleece, microfiber, nylon, wool, canvas, rip-stop fabric, netting, coated fabrics, and breathable waterproof fabric
  - \_\_\_\_d. Preparing fabric and pattern pieces for cutout using a layout diagram
  - \_\_\_\_e. Threading a needle
  - \_\_\_\_f. Parts and operation of a sewing machine



\_\_\_\_2. Demonstrate the following basic hand sewing techniques:

- \_\_\_\_a. Threading a needle
- \_\_\_\_b. Basic stitches: running (straight) stitch, basting stitch, and whipstitch
- \_\_\_\_c. Sewing on a button
- \_\_\_\_d. Hand-sewing a patch onto fabric using a whipstitch

\_\_\_\_3. Demonstrate the following machine sewing techniques:

- \_\_\_\_a. Winding thread onto a bobbin
- \_\_\_\_b. Placing a bobbin into its holder
- \_\_\_\_c. Threading the machine
- \_\_\_\_d. Using the presser foot in its appropriate position
- \_\_\_\_e. Sewing a basting stitch
- \_\_\_\_f. Sewing a straight stitch
- \_\_\_\_g. Sewing a zigzag stitch
- \_\_\_\_h. Machine-sewing a patch onto fabric

Do four of the following (4-15) with at least one optional from Projects (4-8)

**For each project, do the following:**

- \_\_\_\_a. Pick out a pattern and read it.
- \_\_\_\_b. **Using the pattern's material list, collect what is needed.**
- \_\_\_\_c. Prepare the fabric and pattern pieces for cutout.
- \_\_\_\_d. Cut out all the pieces for your project using the layout diagram.
- \_\_\_\_e. Follow the directions carefully to complete your project.

Most any sewing project is acceptable as long as there are instructions to follow.

Project suggestions for gear are:

All That Stuff Bags #544:

<http://www.thegreenpepper.com/downloads/544web.pdf>

Silnylon Stuffsacks: [http://thru-hiker.com/projects/silnylon\\_stuffsacks.php](http://thru-hiker.com/projects/silnylon_stuffsacks.php)

Simple Gaiter Kit: <http://www.rockywoods.com/Fabrics-Kits/Simple-Gaiter-Kit>

Backpack cover: <http://questoutfitters.com/patterns-packs-cart.htm#Pack%20Patterns>

Drawstring bag from a pattern you found

### Projects (Do at least one)

- \_\_\_\_\_4. Complete a simple gear-sewing project.
- \_\_\_\_\_5. Complete a second gear-sewing project.
- \_\_\_\_\_6. Make an item that has a zipper. Describe zipper sizes and styles such as heavy-duty, hidden, separating, non-separating and water-resistant.
- \_\_\_\_\_7. Sew a blanket (e.g. fleece blanket with a sewn edge binding) and donate it.
- \_\_\_\_\_8. Make a sewn item that can be used by your troop. Some suggestions are game equipment such as beanbags or flag football belts and flags, a canvas roll-up organizer and hanger for serving utensils in a camp kitchen, storage bags, a tarp, dining fly, or an item for decoration or a part of a costume used in a troop ceremony.

### Repairs

- \_\_\_\_\_9. Using hand-sewing techniques, repair an item of gear or clothing or practice an in-the-field repair such as sewing a buckle on a piece of webbing.
- \_\_\_\_\_10. Using fabric glue, mend a seam and a tear.
- \_\_\_\_\_11. Put together a repair kit to take on an outdoor outing and describe the contents.

- \_\_\_\_\_12. Zippers on tents and sleeping bag often fail on outings. Explain ways to repair them without replacing them including what to do if the pull brakes. Add zipper sliders in the sizes on your equipment and a few other common sizes of zippers to your repair kit.
- \_\_\_\_\_13. Practice using a sewing awl to sew two thick pieces of material together or a piece of webbing to a piece of packcloth or canvas.
- \_\_\_\_\_14. Shorten a pair of pants or make a pair of pants into shorts with a hem.

### Careers

- \_\_\_\_\_15. Invite someone with a sewing-related career to talk to your Troop, Unit, or patrol.

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# Shotgun



Name \_\_\_\_\_

All Shotgun activities must be done under the safety requirements of the *Trail Life USA Health and Safety Guide* and the *Shooting Sports Guidebook*.

## Do all of the following requirements (1-4)

- \_\_\_\_ 1. Complete the Navigator or Adventurer Shooting Sports Orientation.
- \_\_\_\_ 2. Participate in a Shotgun orientation that covers the following:
  - \_\_\_\_ a. Functions of the Stock, Barrel, and Action and their location on a shotgun
  - \_\_\_\_ b. Importance of proper shotgun fit and how to:
    - \_\_\_\_ i. Hold a shotgun securely and comfortably
    - \_\_\_\_ ii. Mount the shotgun correctly
    - \_\_\_\_ iii. Operate the shotguns parts safely and properly
  - \_\_\_\_ c. Four shotgun shooting sports (Trap, Skeet, Five Stand, and Sporting Clays), the differences between them, and their range layouts
  - \_\_\_\_ d. What the term “Pull” in shotgun shooting sports means and how to use it.
  - \_\_\_\_ e. Shotgun ammunition types and their use: Birdshot, Buckshot, and Slug
- \_\_\_\_ 3. Participate in a shotgun safety orientation that includes the Trailman doing the following:
  - \_\_\_\_ a. Recite from memory the three rules of the *Gold Standard in Gun Safety* guidelines in the Shooting Sports Guidebook or Shooting Sports Supplement.
  - \_\_\_\_ b. Explain the Rules for Safe Gun Use and Storage.
  - \_\_\_\_ c. Describe or demonstrate the common Range Commands.
  - \_\_\_\_ d. List the proper safety gear for shotgun shooting.
  - \_\_\_\_ e. Describe how to safely verify whether a shotgun is loaded or unloaded.
  - \_\_\_\_ f. Describe how to safely pick up a shotgun and carry it from one place to another.
  - \_\_\_\_ g. Describe how to detect each of the following types of shotgun ammunition malfunctions and explain the appropriate action for each type:
    - \_\_\_\_ i. Misfire
    - \_\_\_\_ ii. Hangfire



- Do Three of the following optional requirements (5-12)**

- \_\_\_\_\_ 5. Shoot a round of Trap (25 birds)
- \_\_\_\_\_ 6. Shoot a round of Skeet (25 birds)
- \_\_\_\_\_ 7. Shoot a round of Five Stand(25 birds)
- \_\_\_\_\_ 8. Shoot a round of Sporting Clays(50 birds)
- \_\_\_\_\_ 9. Participate in shooting sampler day and shoot at least 3 different shotgun types (e.g. TLUSA Recoil Rally in Georgia).
- \_\_\_\_\_ 10. Complete the NRA Basic Shotgun course.

- \_\_\_\_\_ 11. Earn a Pro-marksman or higher Winchester/NRA Marksmanship Qualification in any Shotgun discipline.
- \_\_\_\_\_ 12. Participate in a shotgun clinic or competition sanctioned by Civilian Marksmanship Program (CMP), National Rifle Association (NRA), National Shooting Sports Foundation (NSSF), or USA Shooting.

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# Skating Sports

Name \_\_\_\_\_

- \_\_\_\_1. Do the following to learn about skating sports:
- \_\_\_\_a. List the safety and courtesy rules at your ice or roller rink.
  - \_\_\_\_b. Explain the proper clothing, required safety equipment, and parts of the skate for one ice-skating sport (figure skating, speed skating, or ice hockey) or one roller skating sport (artistic skating, speed skating, or roller hockey).
  - \_\_\_\_c. Draw a diagram of the typical rink or one race route used in your sport. As applicable, show measurements, markings (lines, creases, circles, etc.), major race route features and distance markers, etc.
  - \_\_\_\_d. Explain your skating sport including as applicable: your events, how to play, strategy, scoring, and rules.
  - \_\_\_\_e. Show the proper way to fall and to get up after a fall.
- \_\_\_\_2. Do one of the following:
- \_\_\_\_a. Define seven skating terms relevant to your sport. Examples include one and two foot glides, crossovers, pumps, swizzles/fishtails, t-stops, shoot the duck, stroking, and scissors.
  - \_\_\_\_b. Demonstrate at least ten referee signals for hockey and explain what they mean.
  - \_\_\_\_c. Attend or watch a skating competition or hockey game.
  - \_\_\_\_d. Read the biography of a famous skater or hockey player.
- \_\_\_\_3. Demonstrate basic skills for your level by doing one of the following:

- \_\_\_\_\_a. Demonstrate proficiency in the skills for your level in the US Figure Skating Basic Skills Curriculum Chart for your chosen sport (e.g. Basic Skills, Speed, Hockey).
- \_\_\_\_\_b. Pass the next level in US Figure Skating (USFS), Ice Skating Institute (ISI), or Roller Skating Association (RSA) testing.
- \_\_\_\_\_c. Successfully try out for a competitive team.
- \_\_\_\_\_4. Over a period of at least six weeks, participate in at least eighteen practice sessions on different days where a session can be any of the following:
- Team practice or tryout for an organized skating or hockey team
  - A professionally coached skills session, lesson, or class for skating or hockey skills
  - Individual skating or hockey skills practice of at least one hour in duration
  - Ice or roller hockey game in organized league
- \_\_\_\_\_5. Participate in at least two competitions of any of the following types:
- Figure skating
  - Artistic roller skating
  - Speed skating (ice or roller skates)
  - Ice or roller hockey game in organized league

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# Small Engine Mechanics

*This Trail Badge is designed to build up the Body of Christ as well as equip the Trailman. An understanding of how small engines work can be used as a ministry, a hobby, and a profession. Small engines are used to make our lives easier and more productive: lawn care, construction, recreation, and agriculture, among others.*

Name \_\_\_\_\_

This Trail Badge will serve to instruct you in the basic operation and theory of a four-stroke engine. You may need to use the internet and the library. You will need a mentor who has knowledge of small engines and how they work. You should be able to take apart a small four-stroke engine and put it back together with minimal help from a mentor.

## Do the following requirements (1-4)

- \_\_\_\_1. Read 1 Corinthians 12:12-27 and explain how the principle Paul is teaching can relate to a small engine.
- \_\_\_\_2. List 3 examples of machines in everyday life that use a small 4-stroke engine and describe how the engine improves production and use of the machine.
- \_\_\_\_3. Acquire a small engine and prepare your work space.
- \_\_\_\_4. Participate in a work space safety orientation with your Mentor or Instructor to include:
  - \_\_\_\_a. Safety with liquid fuels and chemicals, including proper ventilation
  - \_\_\_\_b. Safety with hand tools
  - \_\_\_\_c. Cleanliness
  - \_\_\_\_d. Organization
  - \_\_\_\_e. Fire Extinguisher availability, proper classification for fuel fires, and operation

## Identification: Do the following requirement (5):

- \_\_\_\_5. With a drawing of a 4-stroke engine, do the following:
  - \_\_\_\_a. Describe the operation and cycle of the 4-stroke engine
  - \_\_\_\_b. Point out the major parts of a 4-stroke engine and its starting system
  - \_\_\_\_c. Identify the basic hand tools required to disassemble and reassemble the engine.
  - \_\_\_\_d. List the common bolt sizes used in the engine

- \_\_\_\_\_e. Describe or show the commonly used grease and degreasers

**Inspection and Investigation: Do the following requirements (6-9):**

- \_\_\_\_\_6. Describe and Demonstrate the following:
  - \_\_\_\_\_a. Use of the basic tools required to disassemble and reassemble the engine.
  - \_\_\_\_\_b. Removal of the blower housing and shrouds
  - \_\_\_\_\_c. Removal of the cylinder head and fuel system
- \_\_\_\_\_7. Investigate and Perform the following:
  - \_\_\_\_\_a. Describe the condition of the combustion chamber
  - \_\_\_\_\_b. Remove the crankcase breather cover and describe the condition
  - \_\_\_\_\_c. Use a feeler gauge to measure valve clearance
  - \_\_\_\_\_d. Remove the flywheel and describe the condition
  - \_\_\_\_\_e. Measure the Bore diameter and Stroke
- \_\_\_\_\_8. Investigate and Perform the following:
  - \_\_\_\_\_a. Remove and clean the crankcase cover
  - \_\_\_\_\_b. Describe the camshaft and the cam timing
  - \_\_\_\_\_c. Remove the piston and the camshaft
  - \_\_\_\_\_d. Describe the Splash Lubrication System
  - \_\_\_\_\_e. Clean the crankcase
  - \_\_\_\_\_f. Remove and inspect the crankshaft
- \_\_\_\_\_9. Describe the 4-stroke engine using engine components

**Installation and Operation: Do the following requirements (10-11):**

- \_\_\_\_\_10. Reassemble and Reinstall the following:
  - \_\_\_\_\_a. Reinstall the crankshaft
  - \_\_\_\_\_b. Reinstall the camshaft and tappets
  - \_\_\_\_\_c. Check piston and rod movement
  - \_\_\_\_\_d. Install the oil slinger
  - \_\_\_\_\_e. Reinstall the crankcase cover with a new gasket
  - \_\_\_\_\_f. Reinstall the flywheel
  - \_\_\_\_\_g. Check the crankshaft end play
  - \_\_\_\_\_h. Check the rotation of the crankshaft
  - \_\_\_\_\_i. Reinstall the cylinder head

- \_\_\_\_j. Reinstall the blower housing and shrouds
  - \_\_\_\_k. Check the operation of the kill switch
  - \_\_\_\_l. Clean the carburetor and fuel tank
  - \_\_\_\_m. Describe the operation of the carburetor
- \_\_\_\_11. Start the engine and review

*Note to the Mentor:*

**"A good mentor imparts wisdom, character, and craft"** - John Sowers, *Relevant Magazine*, Issue 77

*This Trail Badge should take a minimum of 12-15 hours and will require a 4-5 hp lawnmower engine. These engines are readily available at repair shops, scrap yards, yard sales, and from friends and relatives. Usually, these engines can be found for around \$20. A small assortment of hand tools and a very few specialized tools will be needed as well as a space where the engine can be stored between working sessions. It may be necessary to show an operation, then ask the Trailman to perform the same operation on their own, repeating it as necessary to acquire proficiency and/or understanding.*

*To demonstrate his understanding, the Trailman should be able to:*

- 1) Describe the basic parts/components*
- 2) Discuss their operation*
- 3) Disassemble and reassemble a basic 4-stroke engine*

*Resources:*

*Basic 4-stroke Engine Course such as the one available at: [www.crankinengines.com](http://www.crankinengines.com)*

*Single Cylinder L Head Repair Manual: Briggs & Stratton Part # 270962*

*Website: <http://auto.howstuffworks.com/engine2.html>*

*Website: <http://www.animatedengines.com/otto.html>*

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# Soccer

Name \_\_\_\_\_

- \_\_\_\_1. Do the following to learn about soccer:
  - \_\_\_\_a. Explain the basic rules of soccer. Be familiar with the different positions on the field.
  - \_\_\_\_b. Demonstrate at least ten referee signals and explain what they mean.
  - \_\_\_\_c. Identify and define each of the major positions played on the soccer field.
  - \_\_\_\_d. Explain the differences in the rules between indoor and outdoor soccer.
  - \_\_\_\_e. Explain about the basic soccer equipment including: ball size, shin guards, and shoes.
  - \_\_\_\_f. Draw a diagram of either an indoor or outdoor soccer field showing the lines, areas, circles, flags, and other markings.
  - \_\_\_\_g. Explain the difference between indoor and outdoor soccer fields. List the dimensions of each.
- \_\_\_\_2. Do one of the following:
  - \_\_\_\_a. Read a biography of a famous soccer player.
  - \_\_\_\_b. Attend or watch a soccer game played by professional, college, or World Cup players.
- \_\_\_\_3. Demonstrate the following skills:
  - \_\_\_\_a. Ball handling: dribbling, trapping, and passing
  - \_\_\_\_b. Restarting play: throw-ins and corner kicks
  - \_\_\_\_c. Penalty kicks

\_\_\_\_\_4. Over a period of at least six weeks, participate in at least twenty sessions on different days where a session can be any of the following:

- Team practice for an organized team
- A game for an organized team
- A professionally coached skills session, lesson, or class
- At least one hour of pick-up games, skill improving games, or skills practice

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## Special Needs

Name \_\_\_\_\_

Categories of disabilities and impairments are listed below along with representative examples for reference while working on this Trail Badge.

- Physical: limitations on function of limbs, gross motor ability and daily living activities, including congenital medical conditions with no mental or intellectual components
- Sensory: Vision, hearing, smell/taste, touch, balance
- Cognitive and Emotional: **Intellectual disability, Down's syndrome,** neurological disorders, ADHD, autism, learning disabilities, etc.
- Nonvisible: Severe chronic conditions such as epilepsy, diabetes, asthma, severe allergy, etc.

Do all of the following requirements (1-4)

- \_\_\_\_1. Learn the following about disabilities and people with disabilities:
  - \_\_\_\_a. Explain what it means to have a physical disability or impairment.
  - \_\_\_\_b. Describe how to refer to and interact with someone with an impairment or disability using positive and person-first language.
  - \_\_\_\_c. Read the Parable of the Great Banquet (Luke 14:15-23) and explain **what it says about God's feelings towards people with disabilities** and how can we apply it in our lives.
  - \_\_\_\_d. List ways that a person might become physically disabled.
  - \_\_\_\_e. Select a physical disability and list the ways that a person with that physical disability is limited and list the ways that person is not limited.
  - \_\_\_\_f. List any friends or relatives with a disability or impairment and describe how they work around it.
- \_\_\_\_2. Learn about the Americans with Disabilities Act (ADA):
  - \_\_\_\_a. Explain why the ADA was created.

- \_\_\_\_\_b. List several design standards changes since 1990 due to the ADA.
  - \_\_\_\_\_c. Show an image of the International Symbol of Accessibility and explain its meaning.
  - \_\_\_\_\_d. List places where an accessibility sign is usually posted.
- \_\_\_\_\_3. Take an inclusion walk at your Troop meeting place or another community facility.
- \_\_\_\_\_a. Walk around and see if it would be easy or difficult for persons with physical or sensory disabilities or impairments to attend activities there. Identify the features providing easy access and any impediments to access.
  - \_\_\_\_\_b. Make a list of improvements that would help make your facility a more welcoming place for individuals with disabilities.
  - \_\_\_\_\_c. On your walk:
    - Walk from a car to the building/classroom and back.
    - Visit the area where any outdoor activities would take place.
    - Go to the area where snacks and refreshments are served.
    - Go to the restroom and wash your hands.
    - Get a drink of water.
- \_\_\_\_\_4. Plan and implement a Leader-approved, hands-on disabilities awareness program for your troop, unit, or a younger unit using positive and person-first language. Possible activities include:
- While wearing work gloves or a thick set of socks on your hands, put on and button a shirt; put on and zip a jacket; put on and tie shoes.
  - Use a small golf pencil held in your mouth to draw a simple picture; write your name; write a sentence.
  - Prepare a snack while blindfolded.
  - While blindfolded, have a buddy guide you with verbal instructions through a short course with obstacles such as chairs, tables, closed doors, elevators, stairs, etc.
  - Try decoding a short phrase in Braille.
  - Navigate a wheel chair through a short course with obstacles such as chairs, tables, closed doors with automatic closers, elevators, ramps, etc.

- With earplugs or muff style hearing protectors on, try to participate in a conversation with several people.
- While wearing headphones playing moderate volume background noises, take a short math test with a short time limit. This simulates sensory overload.

Do one of the following requirements (5-7)

- \_\_\_\_\_5. Invite one or more persons with a disability or impairment to speak to your Troop or Unit about their life experiences and favorite activities.
- \_\_\_\_\_6. Visit an agency that works with people with disabilities:
- \_\_\_\_\_a. List activities and programs the agency offers
  - \_\_\_\_\_b. Describe training, employment, and education opportunities available to its members
- \_\_\_\_\_7. Help plan and attend an event with your Troop or Unit that allows you to interact with people with disabilities.

Do three of the following optional requirements (8-14)

- \_\_\_\_\_8. Research independent living aids or assistive devices for physical disabilities and impairments and do the following:
- \_\_\_\_\_a. List at least three aids or devices for physical disabilities and impairments
  - \_\_\_\_\_b. Describe the use or function of each listed aid or device.
  - \_\_\_\_\_c. Determine where to get each listed aid or device and their approximate costs.
- \_\_\_\_\_9. Research independent living aids or assistive devices for sensory disabilities and impairments and do the following:
- \_\_\_\_\_a. List at least three aids or devices for sensory disabilities and impairments
  - \_\_\_\_\_b. Describe the use or function of each listed aid or device.
  - \_\_\_\_\_c. Determine where to get each listed aid or device and their approximate costs.
- \_\_\_\_\_10. Select one of the cognitive and emotional disabilities. Create a brochure telling about the disability and some special ways of learning that can help kids with this type of disability.

- \_\_\_\_\_11. Learn to recognize and provide first aid for the following complications of nonvisible disabilities:
- \_\_\_\_\_a. Epileptic seizure
  - \_\_\_\_\_b. Insulin shock and diabetic coma
  - \_\_\_\_\_c. Asthma emergency
  - \_\_\_\_\_d. Anaphylactic shock
- \_\_\_\_\_12. Research autism and sensory overload and do the following:
- \_\_\_\_\_a. Watch the video "Carly's Café - Experience Autism Through Carly's Eyes."
  - \_\_\_\_\_b. List contributing factors to Carly's overload.
  - \_\_\_\_\_c. Describe how you think the others in the cafe should have responded.
  - \_\_\_\_\_d. Explain how to recognize and help a person experiencing a sensory overload.
- \_\_\_\_\_13. Learn how people with disabilities take part in a particular adaptive sport or recreational activity.
- \_\_\_\_\_a. Talk to a gym teacher, Parks and Recreation department, Special Olympics representative, or other adaptive sport/activity volunteer to learn how persons with disabilities or impairments participate and compete in various sports or activities.
  - \_\_\_\_\_b. Volunteer during an adaptive sporting event.
  - \_\_\_\_\_c. Describe the event and what you learned.
- \_\_\_\_\_14. List ten myths and misconceptions about people with disabilities and learn the facts about each myth. Present your findings to your troop, unit, or family.
- \_\_\_\_\_15. List five professions that provide services to people with disabilities and the education, training, and experience required for each.

## Resources

*"Carly's Café - Experience Autism Through Carly's Eyes"*

<https://www.youtube.com/watch?v=KmDGvquzn2k>

This experience is viewed through the eyes of Carly Fleischmann, a 17 year old girl living with non-verbal Autism. Based on an excerpt from the book Carly's Voice: Breaking through Autism, it explores how, for someone with autism, a simple act like going for a coffee can descend into chaos.

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## Stamp Collecting (Philately)

*Stamp collection is a popular hobby. People all over the world collect stamps. Stamp collecting is not only a fun hobby, but also a great way to learn about history and culture.*

Name \_\_\_\_\_

### Do all of the following requirements (1-8)

- \_\_\_\_1. The necessary tools to collect stamps are a pair of tweezers, storage envelopes, storage box, and stamp hinges or stamp mounts. Describe how each of these relates to stamp collecting.
- \_\_\_\_2. Collectors can collect Used or Mint (unused) stamps. Find an example or illustration of each and label difference in gum and postmark.
- \_\_\_\_3. **Stamps can be classified as Definitives or Commemoratives.** List what the USA's first definitive and commemorative stamps depicted and when they were printed.
- \_\_\_\_4. Mounting stamps correctly preserves their appearance and value. Demonstrate the use of stamp hinges to affix stamps to the stamp album or notebook page. Using a stamp mount, affix a mint stamp to the page.
- \_\_\_\_5. Collect 50 different stamps from correspondence and explain or demonstrate the following:
  - \_\_\_\_a. How to soak stamps from the envelope
  - \_\_\_\_b. How-to and when to carefully cut out the self-adhesive stamps
- \_\_\_\_6. Choose a theme to start you own collection in a stamp album or notebook. Label the page and mount your new collection. Watch for stamps to add to your own collection and ask family and friends to save stamps for you.

- \_\_\_\_7. Stamps reflect what a country feels is important. Select 10 culturally significant stamps. Mount them and label each with a description that explains what the stamp depicts.
- \_\_\_\_8. Research how collecting used stamps can help support missions. Report what you find with your unit, troop or family.

Do three of the following optional requirements (9-21)

- \_\_\_\_9. Find the current United States Postal Service rates for 1st Class mail, airmail and postcards. Explain when each of these postage rates is used.
- \_\_\_\_10. Introduce stamp collecting to someone younger. Show them your album and talk with them about how you handle the stamps, mount them and collect them.
- \_\_\_\_11. When adding older stamps to your collection, you may find several that look alike, but differ only in their perforations. Research the number of perforations and demonstrate how to measure with a perforation gauge or an illustration of a perforation gauge.
- \_\_\_\_12. The first adhesive postage stamp in the world was issued in 1840, and the hobby of the stamp collecting was born. Find out who issued it and why it is nicknamed **"Penny Black"**.
- \_\_\_\_13. Airmail stamps were introduced in 1918. Since then they have used Curtis Jenny, DC-4, and Jets on the stamps. Find at least 5 air mail stamps.
- \_\_\_\_14. **Research errors in printing such as the famous "Jenny invert" that have enhanced the collecting value of stamps.**
- \_\_\_\_15. Visit the National Postal Museum in Washington D.C.
- \_\_\_\_16. Start a stamp collection of a foreign country or worldwide stamp collection.
- \_\_\_\_17. Stamp designs are suggested by the public. Research the process that the **Citizen's Stamp Advisory Committee** uses to select a stamp design. Design your own stamp following their rules and guidelines.



- \_\_\_\_18. Set up a Stamp Fest for your troop. Invite an expert to come in and share with the troop. Invite Philatelists (stamp collectors) to come share their albums and special interest collections.
- \_\_\_\_19. Older stamps had watermarks. Research the different types and prepare an informative page on them.
- \_\_\_\_20. Some stamps have the same design but have perforations on differing sides. Differentiate between coils and sheets, explaining the perforations possible with each.
- \_\_\_\_21. Scott Publishing Company was the first to catalog stamps by assigning numbers to the stamps. Find the “Scott Number” for 5 of your stamps in your collection.

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# Survival Skills

Name \_\_\_\_\_

To work on Survival Skills, one must be at least an Able or Journey Trailman who has completed the Camping, Fire Ranger, First Aid, Ropework, Trail Skills, and Woods Tools Trail Badges. Care must be taken to ensure that the activities of this Trail Badge are permitted in the location(s) used to complete the requirements.

## Planning and preparation requirements (1-4)

- \_\_\_\_1. **Principles.** Explain the following survival principles and practices:
- \_\_\_\_a. Buddy system for prevention
  - \_\_\_\_b. Stop, Think, Observe, Plan (STOP) steps in a survival situation
  - \_\_\_\_c. Survival rules of 3 (3 minutes without oxygen, 3 hours without shelter in an extreme environment, 3 days without water, 3 weeks without food)
  - \_\_\_\_d. The five key needs: First aid, shelter, fire, signal, water
  - \_\_\_\_e. Avoid eating wild foods in short term emergency situations
- \_\_\_\_2. **Common Myths.** Investigate the following myths and explain why each of these is **NOT** a safe survival practice:
- \_\_\_\_a. Find food first
  - \_\_\_\_b. Roof before bed
  - \_\_\_\_c. Fire through persistence – In other words if you try hard enough you can do it without the correct tools or skill
  - \_\_\_\_d. Suck Poison out of a snake bite
  - \_\_\_\_e. Drink water from a cactus
  - \_\_\_\_f. Drinking urine
  - \_\_\_\_g. Rationing water in the desert
  - \_\_\_\_h. Your cell phone will save you
- \_\_\_\_3. **Water.** Research survival water procurement and list the following:
- \_\_\_\_a. The amount of water a person needs each day
  - \_\_\_\_b. Steps to take to conserve body hydration during extreme temperatures
  - \_\_\_\_c. Impact of high altitude, injury or illness on your need for water
  - \_\_\_\_d. Four signs that may indicate water is near

- \_\_\_\_\_e. Two methods of purifying water
- \_\_\_\_\_4. **Survival Kit.** Make a survival kit (see resource section) to be used on the survival overnighiter and do the following:
  - \_\_\_\_\_a. Make some waterproofed matches for your survival kit.
  - \_\_\_\_\_b. Make at least two types of homemade fire-starters for your survival kit.
  - \_\_\_\_\_c. Include materials for at least two types of fire starting methods other than matches and lighters.
  - \_\_\_\_\_d. Explain when and how to use the contents of the survival kit.

**Skill demonstration requirements (5 – 9):**

Note: Any of requirements 5 – 8 may be done on the survival overnighiter to help meet the parts of requirement 9.

- \_\_\_\_\_5. **Shelter.** Build a survival shelter (see resources below for suggested types of shelters).
- \_\_\_\_\_6. **Fire.** Demonstrate your fire starting skills:
  - \_\_\_\_\_a. Start a fire using a fire using a starting method other than matches or lighters and a fire starter or tinder types from the resource section.
  - \_\_\_\_\_b. Bring at least one cup of water to a full boil.
  - \_\_\_\_\_c. Start a second fire using a different starting method (other than matches or lighters) and a different fire starter or tinder types from the resource section.
  - \_\_\_\_\_d. Bring at least one cup of water to a full boil on the second fire.
- \_\_\_\_\_7. **Food.** Prepare a hot survival meal from a dehydrated food package, MRE (meals ready to eat), or your emergency food.
- \_\_\_\_\_8. **Signaling.** Demonstrate two signaling techniques and one method of looking bigger to a searcher in the air. (See the Resources section below).
- \_\_\_\_\_9. **Survival Overnighiter.** With your survival kit and essentials, spend the night in a survival shelter you helped build and do the following:
  - \_\_\_\_\_a. Make a fire without matches for warmth, to heat a meal, or boil water.
  - \_\_\_\_\_b. Purify your drinking water from a local source.
  - \_\_\_\_\_c. Eat at least one hot meal you help prepare.

# Resources

## Survival Manuals

- Trailman's Handbook
- FM 21-76 US Army Survival Manual
- Aircrew Survival, Air Force Pamphlet 36-2246 or 64-5
- United States Air Force Search and Rescue Survival Training 64-4

## Suggested Survival Shelter Types

A-Frame Tarp	Quinzhee or Quintze hut	Tarp Reflector
Desert Double Roofed Tarp	Ramada	Wigwam
Fallen tree	Wedge Tarp	Wicki-up
Lean-To (tarp or branch)	Lean-To (tarp or branch)	Lean-To with Raised Bed
Tarp Hammock	Swamp Bed	Tarp Tipi (0, 1, 3 or poles)
Debris hut	Hoop house	Trench

## Survival Kit and Essentials Suggestions

- Fire starting (ignition sources and fire starters)
- Paracord or other types of rope or line
- Fishing line and hooks
- Duct tape and thin wire
- Navigation and Signaling (Compass, whistle, mirror, flashlight, etc.)
- First aid kit
- Emergency food
- Water bottle(s), collection, and purification
- Tools and pocket knife
- Rain gear, extra clothing, and sun protection
- Sleeping bag (cold weather)
- Small Bible or Testament

## Survival Kit Containers:

- Mini survival kit using an Altoids® tin or similar size container
- Small backpack
- Tupperware® or other small sealable food containers
- Fishing tackle storage containers
- Ammo can

## Fire Starting and Tinder Suggestions

**Caution:** Large poison ivy plants have hair like fibers that look like great tinder. Don't touch and don't burn! The smoke can carry the toxic oils on to your skin and clothing and into your lungs!

Fire Starting Methods	Homemade Fire Starters
Hand drill	Char Cloth, Dryer lint, or cotton balls
Two man hand drill	Dryer Lint and candle wax or Vaseline
Fire plough	Cotton Balls and candle wax or Vaseline
Pump fire drill	<b>Tinder Examples</b>
Bow drill	Dead Evergreen Needles
Fire thong	Dry Grass, Ferns Fungi or Moss
Flint and Steel or other metal spark sets	Dry inner tree bark
Batteries and steel wool	Dry Leaves
Air piston	Jute twine
Bamboo saw	Palm fibers
Magnifying glass (plastic, glass or ice!)	Seed heads (i.e., Cattail, Thistle, Milkweed)
Waterproofed matches	Wood Shavings

## Signaling and Visibility Techniques:

- Whistles
- Flashlight
- Signal mirror
- Signal fires and smoke
- Waving bright colored clothing or tarps on poles
- Laying out large orange tarp
- Ground-to-air emergency signal code
- International distress signal

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# Survivalist

Name \_\_\_\_\_

Survivalist builds on the Survival Skills Trail Badge. It focuses on the skills needed for longer term survival in the wilderness. To work on Survivalist, one must be an Adventurer who has completed the Survival Skills Trail Badge. Care must be taken to ensure that the activities of this Trail Badge are permitted in the location(s) used to complete the requirements.

*Note: Before ingesting any wild plant, fish, or land animal, get permission from your Mentor, Advisor, or wild foods expert as to what plants, fish, and land animals are safe to identify and eat in your area. Some edible and poisonous plants are difficult to distinguish and people die every year thinking they can identify the proper edible plants.*

## Planning and preparation requirements (1-3)

- \_\_\_\_\_1. Planning. Determine the wilderness area types available locally or in which you plan to travel. Possible wilderness area types include mountains, snow and ice, open ocean, woods, lakes and rivers, swamps, and desert. Then do the following:
  - \_\_\_\_\_a. List the survival skills applicable to your selected wilderness area types.
  - \_\_\_\_\_b. List the survival supplies small and light enough to be carried along for each selected wilderness area type.
- \_\_\_\_\_2. Survival Kit. Replenish supplies and upgrade the survival kit you made for Survival Skills (see resource section). Explain when and how to use the contents of the survival kit.
- \_\_\_\_\_3. Mental and Spiritual Preparedness. Show and explain your survival kit to a younger unit or patrol and do the following:
  - \_\_\_\_\_a. Explain to them what your thought processes and spiritual understanding should be in emergency survival situation.
  - \_\_\_\_\_b. Read the 23<sup>rd</sup> Psalm to them and explain how it relates to His care during a survival scenario.
  - \_\_\_\_\_c. Teach them one of the following:
    - \_\_\_\_\_i. Requirement 1 for Survival Skills Trail Badge: Survival principles and practices
    - \_\_\_\_\_ii. Requirement 3 for Survival Skills Trail Badge: Water
    - \_\_\_\_\_iii. Buddy system, basic trail safety, and what to do when they are lost.

### Skill demonstration requirements (4 – 8):

Note: Any of requirements 4 – 7 may be done on the survival weekender to help meet the parts of requirement 8.

- \_\_\_\_\_4. Water. Construct and demonstrate one of the following water collecting devices and understand which environments these will work and not work:
  - \_\_\_\_\_a. Ankle dew collectors
  - \_\_\_\_\_b. Snow machine
  - \_\_\_\_\_c. Solar still
  - \_\_\_\_\_d. Vegetation bag
  - \_\_\_\_\_e. Transpiration bag
- \_\_\_\_\_5. Signaling. Demonstrate three signaling techniques and one method of looking bigger to a searcher in the air. (See the Resources section below).
- \_\_\_\_\_6. Wild Plant Food. Learn what plant parts are safe to eat and do the following:
  - \_\_\_\_\_a. Describe where to find them
  - \_\_\_\_\_b. Describe how to identify them
  - \_\_\_\_\_c. Describe how to prepare them
  - \_\_\_\_\_d. Make a list of these foods and during what season(s) you might find them.
  - \_\_\_\_\_e. Find several of these foods in the wilderness.
  - \_\_\_\_\_f. Explain the dangers of misidentifying these plants and/or eating a potentially hazardous plant.
- \_\_\_\_\_7. Wild animal trapping. Review the wildlife trapping laws in your state and local area and participate in a trapping learning activity and do the following:
  - \_\_\_\_\_a. Describe how to properly construct, set, and monitor animal traps.
  - \_\_\_\_\_b. List the characteristics of good locations for setting traps.
  - \_\_\_\_\_c. Explain how to safely remove animals that are caught.
  - \_\_\_\_\_d. Construct, set, and safety trigger two traps. (See the resource section for example types)
  - \_\_\_\_\_e. With the proper state and local area permissions and licenses, catch or trap a fish or land animal. Then properly clean it, cook it, and eat it.
- \_\_\_\_\_8. Survival Weekender. With your survival kit and essentials, camp two nights in a survival shelter you helped build and do the following:
  - \_\_\_\_\_a. Make a fire without matches for warmth, to heat a meal, or boil water.
  - \_\_\_\_\_b. Purify your drinking water from a local source.

- \_\_\_\_\_c. Eat at least two hot meals you help prepare from wild foods (plants, fish, or land animals).

## Resources

See the resources section for Survival Skills Trail Badge for manuals, shelters, kit suggestions, signaling, and fire starting.

## Animal Traps

Bait Stick Snare	Bow Trap	Drag Noose
Drowning Snare	Figure Four Deadfall	Greasy String Deadfall
Fish Snare	Fixed-Loop wire or Steel Cable Snare	Improved Springle Snare
Leg Snare	McPherson Spring Deadfall	Motion Triggered Snare
Ojibwa Bird Pole	Paiute Deadfall	Peg snare
Squirrel Pole	Toggle Deadfall	Treadle Snare

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# Tennis

Name \_\_\_\_\_

\_\_\_\_1. Do the following to learn about tennis:

- \_\_\_\_a. Explain how the scoring system for tennis works and the difference between Advantage and No-Ad scoring.
- \_\_\_\_b. Explain the difference between the ITF Rules of Tennis and The Code. Describe how The Code enables players to play fairly when tennis officials are not present.
- \_\_\_\_c. Discuss the roles and responsibilities of chair and line umpires at official tennis matches, and show the signals a line umpire would use to call a shot out or good.
- \_\_\_\_d. Draw a diagram of a regulation tennis court. Explain the dimensions of the each area of the court and describe how the lines separate the court into the following areas: service line, back line, singles court and doubles court.
- \_\_\_\_e. Explain what a foot fault is.
- \_\_\_\_f. Describe the three primary surfaces of tennis courts: hard court, grass and clay. Describe the effect these different surfaces have on the ball and how strategies may differ depending on the surface of the court.
- \_\_\_\_g. Demonstrate the following types of grips: continental, eastern forehand, semi-western, western, eastern backhand and two-handed backhand, and explain when each grip is primarily used.

\_\_\_\_2. Do one of the following:

- \_\_\_\_a. Describe the history of tennis and explain what the Modern Open Era means.
- \_\_\_\_b. Tell about the evolution of the tennis racquet and the strings.
- \_\_\_\_c. Attend or watch a regulation tennis match among local amateurs, high school or college players, or a professional match.

- \_\_\_\_\_d. Read a biography of a professional tennis player.
- \_\_\_\_\_3. Demonstrate the following skills:
- \_\_\_\_\_a. Basic tennis shots: serve, forehand, backhand, volley, slice, smash, and lob
- \_\_\_\_\_b. Hitting: down the line, cross-court, and drop.
- \_\_\_\_\_c. Serving: flat serve, topspin serve, a slice or sidespin serve, and a kick serve.
- \_\_\_\_\_4. Over a period of at least six weeks, participate in at least twenty sessions on different days where a session can be any of the following:
- Team practice for an organized team
  - A team competition or tournament for an organized team
  - A professionally coached skills session, lesson, or class
  - At least one hour of pick-up games, shot improving games, or basic shot practice

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## Vehicle Care

Name \_\_\_\_\_

Automobiles are an important part of life today. For some people they are simply a way to get from one place to another. For others, owning and caring for a car is a fun hobby. Either way, in order to depend on a vehicle you should understand:

- How it works and how to take care of it
- Regulations affecting the ownership and upkeep of your vehicle

Do all of the following requirements (1-5)

\_\_\_\_\_1. Point out each of the following devices and systems in each category (if present) on an automobile or using a diagram of an automobile and describe or demonstrate how each is used:

- \_\_\_\_\_a. Lighting: headlights, interior lights, dashboard indicators, turn signals, brake lights, and tail lights
- \_\_\_\_\_b. Drive Train: gas pedal, engine, transmission, universal joint, axles, and wheels
- \_\_\_\_\_c. Stopping: brakes, brake pedal, rear brake lights, transmission for either neutral or downshifting
- \_\_\_\_\_d. Turning: signals, mirrors, and steering wheel
- \_\_\_\_\_e. Safety: automatic braking system, back-up camera, radar, seatbelts
- \_\_\_\_\_f. Engine Compartment: engine block, carburetor/throttle body, battery, spark plug, radiator, fan and belts, thermostat, oil dipstick, oil filter, brake fluid dipstick, power steering fluid, and washer fluid reservoir.

\_\_\_\_\_2. Either take an auto maintenance class offered by your school or community that covers the following material or do the following under appropriate adult supervision:

- \_\_\_\_\_a. Demonstrate how to check and add the following fluids in your family car: brake, windshield wiper, oil, gas, transmission, radiator, and power steering.
  - \_\_\_\_\_b. List the different types of fuel available for modern cars and which are used in your family car(s).
  - \_\_\_\_\_c. Describe the meaning of the different octane ratings for gasoline and if applicable, list which is best to use in your family car(s).
  - \_\_\_\_\_d. Demonstrate how to calculate the gas mileage for your family car(s).
  - \_\_\_\_\_e. List the recommended tire pressure(s) for your family car(s).
  - \_\_\_\_\_f. Demonstrate checking tire pressure on a car or truck.
  - \_\_\_\_\_g. Demonstrate changing a tire.
- \_\_\_\_\_3. Research items that should be included in a breakdown or emergency car kit. **With your parent's help, prepare or replenish such a kit for your family vehicle.**
- \_\_\_\_\_4. Develop a vehicle inspection checklist. Under appropriate adult supervision, complete a vehicle inspection using the checklist once a week for a month.
- \_\_\_\_\_5. Each state passes laws and sets policies regarding the use and operation of motor vehicles. To educate the public and enforce these policies, each state has an agency to: **test drivers, inspect vehicles, issue driver's licenses, track driving records, register vehicles, and issue license plates.** Research your **state's agency and driving laws and do the following:**
- \_\_\_\_\_a. **List the requirements for getting a driver's license in your state including the steps, training, cost and testing associated with receiving your license. Describe the details of your state's graduated driver's license program.**
  - \_\_\_\_\_b. Describe the violations that could cause you to lose your driving privileges.



- \_\_\_\_\_c. Describe what is covered by collision, liability, and comprehensive automobile insurance.
- \_\_\_\_\_d. List factors considered in setting automobile insurance rates.
- \_\_\_\_\_e. List the regulations in your state regarding: vehicle registration, license plates, automobile insurance and proof of insurance.
- \_\_\_\_\_f. Describe the process of any state and local required vehicle inspections including how often, what is inspected or tested, and who is authorized to inspect (local mechanic, state-operated facility, etc.).

**Do two of the following optional requirements (6-12)**

- \_\_\_\_\_6. Some people enjoy fixing up and driving older model cars. Many people get **together with other classic car enthusiasts to enjoy each other's work. Attend a classic car show.**
  - \_\_\_\_\_a. While at the show, follow car show etiquette including: no touching the cars, no leaning on the cars, do not let your belt or other items touch a car, be respectful of the vehicles you see, and no running around the cars.
  - \_\_\_\_\_b. Interview one of the car owners about their classic car and report to your Mentor what you learned about the car.
- \_\_\_\_\_7. Explain why it is important to keep your vehicle clean and do the following:
  - \_\_\_\_\_a. Demonstrate how to properly wash and dry the exterior of a car.
  - \_\_\_\_\_b. Demonstrate how to properly clean the inside of a car, including the carpet/floor, seats, mats, windows and dash.
  - \_\_\_\_\_c. List some good tips for getting the vehicle clean and reducing water spots.
- \_\_\_\_\_8. Different types of vehicles have advantages and disadvantages. List the key advantages and disadvantages of each of these vehicle design types: SUVs, Convertibles, Light duty trucks (pickups), Vans/Mini-Vans, Sports cars, and Hybrids.

- \_\_\_\_\_9. Annually, many cities host a new model year car show to educate the public about changes to manufacturer's offerings. Attend such a car show and obtain promotional brochures from at least three manufacturers, or take photos of at least three manufacturer's vehicles. Discuss how the new models have changed since the prior model was introduced and note whether the change(s) were cosmetic (appearance only), safety related, or performance related.
- \_\_\_\_\_10. Research the history of the automobile.
- \_\_\_\_\_a. List who invented the automobile; when it was invented; and where was it invented.
- \_\_\_\_\_b. Explain how the invention of the automobile changed the world.
- \_\_\_\_\_c. List at least five career opportunities in the automotive field.
- \_\_\_\_\_11. Define the following terms and explain how they relate to cars: torque, combustion, viscosity, and horsepower.
- \_\_\_\_\_12. Design your ideal car concept using drawings and include: fuel type, number of seats, color and style, and safety features.

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Date

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# Volleyball

Name \_\_\_\_\_

- \_\_\_\_1. Do the following to learn about volleyball:
  - \_\_\_\_a. List the basic rules of volleyball.
  - \_\_\_\_b. Define the following terms: ace, side-out, dig, kill, assist, and block.
  - \_\_\_\_c. Demonstrate the referee signals.
  - \_\_\_\_d. Draw a court showing the attack area and label the measurements.
  - \_\_\_\_e. Explain the zones of the court.
  - \_\_\_\_f. **List the net height for men's, women's, and co-ed teams.**
  - \_\_\_\_g. List the size and weight of the ball.
- \_\_\_\_2. Do one of the following:
  - \_\_\_\_a. Attend or watch a volleyball tournament.
  - \_\_\_\_b. Attend or watch a college volleyball game.
  - \_\_\_\_c. Read a biography of a famous volleyball player.
- \_\_\_\_3. Demonstrate the following skills: serving, blocking, digging, passing, setting, and spiking
- \_\_\_\_4. Over a period of at least six weeks, participate in at least twenty sessions on different days where a session can be any of the following:
  - Team practice for an organized team
  - A game for an organized team
  - A professionally coached skills session, lesson, or class
  - At least one hour of pick-up games, skill improving games such as repeated passing and setting to oneself or passing to a specific spot, or skills practice

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# World Heritage

*Our great nation has been melded together with people from all over the world. These extreme variations have been instrumental in making our nation the extraordinary place we have the pleasure to live in.*

Name \_\_\_\_\_

## Do all of the following requirements (1-3)

- \_\_\_\_\_1. Choose two countries different from your family's heritage and from two different continents. If doing this with others, choose different countries than other participants. Highlight your chosen countries on a world map.
- \_\_\_\_\_2. Learn about the life of a boy your age in your chosen countries. Describe his clothing, chores, education, recreation, and his role in family life.
- \_\_\_\_\_3. Learn about the history and traditions of your chosen country and note which, if any, have influenced American culture.

## Do five of the following requirements (4-24)

- \_\_\_\_\_4. Research popular foods and dishes from your chosen countries. Cook a meal from one of them for your family, Patrol or Troop.
- \_\_\_\_\_5. Research the history of Christianity and current missionary activity in your chosen countries. Pray for these missionaries for one week.
- \_\_\_\_\_6. Choose your favorite Christmas tradition. Research and describe its world history.
- \_\_\_\_\_7. Find a traditional story, folk tale, or legend from one of your chosen countries. Read it to a younger sibling or the younger boys in your Troop.
- \_\_\_\_\_8. Research popular outdoor activities in your chosen countries. Compare and contrast to popular outdoor activities (including camping, hiking, swimming and sports) in the United States.
- \_\_\_\_\_9. Learn some of the basic words in two different non-English languages from your chosen countries (e.g. French for Canada and Spanish for Peru). Demonstrate saying **at least "hello", "goodbye", "yes", "no", and "My name is...." In both languages.**
- \_\_\_\_\_10. Learn to count to ten in two different non-English languages from your chosen countries (e.g. French for Canada and Spanish for Peru) and demonstrate counting to ten in both languages.
- \_\_\_\_\_11. Research art and artists from one of your chosen countries and report what you learned.
- \_\_\_\_\_12. List at least five common jobs in one of your chosen countries and explain how you train to do these jobs.

- \_\_\_\_\_13. Research traditional foods from one of your chosen countries and describe the most exotic thing you found to your Patrol or Troop. Ask your fellow Trailmen if they would eat it and why or why not.
- \_\_\_\_\_14. Make a model or sketch of a house from another country. Include a list of materials used to build it.
- \_\_\_\_\_15. Compare per capita income or purchasing power for your chosen countries and the United States. Report how this affects the lifestyle of residents in your chosen and the United States (See a list of possible measures in Resources below).
- \_\_\_\_\_16. Participate in an international Pen-Pal program through a parent-approved organization to learn about your Pen-Pal's **family, culture, school, and activities**.
- \_\_\_\_\_17. Select an Olympic sport popular in one of your chosen countries that is not popular in the United States. Make a poster, presentation, or video to explain the sport and its rules, play, and strategy.
- \_\_\_\_\_18. Arrange for someone who has lived or traveled extensively in another country to come and speak to your troop about his or her travels.
- \_\_\_\_\_19. Visit a monument in the U.S. that was placed in honor of the immigrants who came to America. Explain what the monument commemorates.
- \_\_\_\_\_20. Visit a local community or festival that **is dedicated to another country's culture and** eat a meal there.
- \_\_\_\_\_21. Research two notable immigrants in U.S. History. Describe their contributions to our society.
- \_\_\_\_\_22. Take a tour at the Tenement Museum in New York City or another museum dedicated to education about immigration from around the world.
- \_\_\_\_\_23. Visit Ellis Island to learn about U.S. immigration past and present.
- \_\_\_\_\_24. Participate in a history fair with others working on this badge highlighting key historical events for your chosen countries.

## Resources

The World Factbook by the Central Intelligence Agency  
<https://www.cia.gov/library/publications/the-world-factbook/>

Economic measures of income/purchasing power average and dispersion:

- Average (per capita or person)
  - Average per capita income
  - Median per capita income
  - Per capita GDP or Per capita Purchasing Power (PPP): CIA World Factbook
- Dispersion
  - GINI Index (Distribution of family income): CIA World Factbook
  - Per capita income quartiles
  - Per capita income deciles
  - Per capita income percentiles

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