

Fairfield Matrix

American Business Sessions: C	Animation Sessions: A,B,C	Architecture Sessions: A,C <i>See prework</i>
Art Sessions: A,C	Astronomy Sessions: B <i>See prework</i>	Aviation Sessions: B-C <i>See prework</i> <i>Scouts 13 and over</i> Additional fee
Chemistry Sessions: A,C <i>See prework</i> <i>Scouts 13 and over</i>	Chess Sessions: A,B,C <i>See prework</i>	Citizenship...Community* Sessions: A,B,C Scouts 12 and over <i>See prework</i>
Citizenship...Nation* Sessions: A,B,C <i>See prework</i> <i>Scouts 14 and over</i>	Citizenship...World* Sessions: A,B,C Scouts 13 and over <i>See prework</i>	Coin Collecting Sessions: B <i>See prework</i>
Collections Sessions: A Limited 16 Scouts <i>See prework</i> Stamp & Coin Collecting are excluded	Communication* Sessions: A,B,C Limited 16 Scouts <i>See prework</i> <i>Scouts 13 and over</i>	Cooking* Sessions: A-B Scouts 13 and over <i>See prework</i>
Crime Prevention Sessions: A <i>See prework</i>	Digital Technology Sessions: A,B Limit 15 Scouts <i>See prework</i> <i>First Class or above</i> CyberChip required	Dog Care Sessions: A,C <i>See prework</i> Start 60 days prior to class
Drafting Sessions: B <i>See prework</i>	Electricity Sessions: A,C <i>See prework</i>	Emergency Preparedness* Sessions: A-C <i>See prework</i> <i>Scouts 13 and over</i>
Energy Sessions: A <i>See prework</i>	Engineering Sessions: B,C <i>See prework</i> <i>Scouts 13 and over</i>	Family Life* Sessions: A,B,C <i>See prework</i> Start 90 days prior
Fingerprinting Sessions: B,C	Fire Safety Sessions: B,C <i>See prework</i>	First Aid* Sessions: A-C <i>See prework</i> <i>Completed all 1st Aid req.</i> <i>for Tenderfoot, 2nd, & 1st</i> <i>Class</i> Additional fee

Fly Fishing Sessions: C Limited 12 Scouts	Game Design Sessions: A,B,C <i>See prework</i>	Genealogy Sessions: A,B <i>See prework</i>
Geocaching Sessions: A,B <i>See prework</i>	Geology Sessions: A,C <i>See prework</i>	Inventing Sessions: B Limited 12 Scouts <i>See prework</i> <i>Scouts 13 and over</i>
Journalism Sessions: C	Law Sessions: C <i>See prework</i> <i>Scouts 14 and over</i>	Leatherwork Sessions: A,B Limited 12 Scouts
Medicine Sessions: C <i>See prework</i>	Model Design & Building Sessions: B,C <i>See prework</i>	Moviemaking Sessions: A,C Limit 12 Scouts <i>See prework</i>
Music Sessions: B Limit 15 Scouts <i>See prework</i> <i>2 years experience recommended</i>	Nuclear Science Sessions: A,B,C <i>See prework</i>	Personal Management* Sessions: A,B,C <i>See prework-90 days prior</i> <i>Scouts 13 and over</i>
Pets Sessions: B,C <i>See prework</i> <i>Start 4 months prior</i>	Photography Sessions: A,C Limit 12 Scouts <i>See prework-cell phone & tablets will not meet the requirements</i>	Plumbing Sessions: A <i>See prework</i>

Public Health Sessions: B <i>See prework</i>	Public Speaking Sessions: B,C Limit 12 Scouts <i>See prework</i>	Radio Sessions: C Limit 15 Scouts <i>See prework</i>
Railroading Sessions: B-C	Reading Sessions: B <i>See prework</i>	Robotics Sessions: A-B Limit 8 Scouts <i>See prework</i> <i>Scouts 13 and over;</i> <i>additional fees</i>
Safety Sessions: A <i>See prework</i>	Salesmanship Sessions: C	Search & Rescue Sessions: A-B <i>See prework</i>

<p>Space Exploration Sessions: B,C <i>See prework</i></p>	<p>Surveying Sessions: C <i>See prework</i> <i>Scouts 13 and over</i></p>	<p>Sustainability* Sessions: A,B,C <i>See prework</i></p>
<p>Weather Sessions: A <i>See prework</i></p>	<p>Wood Carving Sessions: A,B,C Limit 12 Scouts <i>See prework</i> Must have Toten' Chip; Additional fee; Limit 15 Scouts</p>	<p>Woodwork Sessions: B,C Scouts 13 and over; Limit 12 Scouts <i>See prework</i></p>

This document contains the required Merit Badge prework and class fees for
Fairfield Merit Badge Challenge 2019

Prework: The Prework is to be completed BEFORE the first day of Merit Badge Challenge. Specific items are listed by merit badge that the Scout needs to complete and bring the first Saturday. Some are time dependent and need to be started upon receipt of this document.

ALL MERIT BADGE CLASSES REQUIRE READING THE MERIT BADGE PAMPHLET BEFORE CLASS.

Impact of Plagiarism:

Scouts are highly encouraged to use the Internet as an aid to earn merit badges (with parental permission).

This information should then be written by the Scout in his own words. Direct copying can result in the counselor returning the work as unacceptable.

Fees: Some merit badges have fees for supplies or materials and are noted throughout this document. Merit badge class fees are to be paid to the counselor on the first day of class.

Merit Badge Prerequisites, Fees, and Age/Maturity Requirements

Merit Badges are in alphabetical order.

AMERICAN BUSINESS

ANIMATION

ARCHITECTURE

Prework: Requirement #1b- Select an architectural achievement that has had a major impact on society. Using resources such as the Internet (with your parent's permission), books, and magazines, find out how this achievement has influenced the world today. Tell your counselor what you learned.

Complete requirement #4 and **bring to class on the first Saturday**. Measure your bedroom. Make an accurately scaled drawing of the floor plan indicating walls, doors, windows, and furniture. Neatly label your drawing, including name, Troop number and date. (Drawing scale: 1/4" = 1 foot). **Hint: Refer to and use the symbols found in the Architecture Merit Badge pamphlet.**

ART

ASTRONOMY

Prework: Read the current Astronomy Merit Badge pamphlet. Then complete Requirement #5,

#7a, **and** #7b: Describe the composition of the Sun, its relationship to other stars, and some effects of its radiation on the Earth's weather and communications. Define sunspots and describe some of the effects they may have on solar radiation.

AVIATION

Prework: Complete Requirement #1a:

- Define “aircraft.”
- Describe some kinds and uses of aircraft today.
- Explain the operation of a piston engine.
- Explain the operation of a turboprop engine.
- Explain the operation of a jet engine.

At least 5 different kinds of aircraft need to be described. Illustrations, drawings, images and/or photo's may be copied and used, but each aircraft needs to be described using your own words. Illustrations, drawings, images, and/or photos may be copied and used for engine descriptions as well, but each engine needs to be described using your own words. For the 5 aircraft and 3 types of engines, it is suggested that a minimum of 40 words each be used in the aircraft/engine descriptions.

CHEMISTRY

Prework: Complete Requirement #5. List the four classical divisions of chemistry. Briefly describe each one, and tell how it applies to your everyday life.

CHESS

Note: SCOUTS NEED TO BE EXPERIENCED AT PLAYING CHESS TO COMPLETE THIS BADGE.

Prework: Complete Req. #1: Discuss with your merit badge counselor the history of the game of chess. Explain why it is considered a game of planning and strategy.

Complete Req. #2: Discuss with your merit badge counselor the following:

- a. The benefits of playing chess, including developing critical thinking skills, concentration skills, and decision-making skills, and how these skills can help you in other areas of your life.
- b. Sportsmanship and chess etiquette.

CITIZENSHIP IN THE COMMUNITY

Scouts 13 and over only.

Prework: Complete Requirement #3a: Attend a meeting of your city, town, or county council or school board; OR attend a municipal, county or state court session.

For Requirement #3b: Prepare a short written report for your counselor. Choose one of the issues discussed at the meeting [in 3a] where a difference of opinions was expressed, and explain in your report why you agree with one opinion more than you do another one.

Complete Requirement #4a: Choose an issue that is important to the citizens of your community; find out which branch of local government is responsible for this issue.

Complete Requirement #4b: Interview one person from the branch of government you identified in requirement 4a. Ask what is being done about this issue and how young people can help.

Complete Requirement #4c: Prepare a short written report for your counselor discussing what you learned in your interview.

Complete Requirement #5: Watch a movie that shows how the actions of one individual or group of individuals can have a positive effect on a community. Prepare a short written report for your counselor discussing what you learned from the movie about what it means to be a

valuable and concerned member of the community. Movie ideas can be found on the merit badge website.

The short written reports above, preferably typed, should be in your own words, and at least 250 words in length. Bring to class on the first Saturday. Be sure to include your name, Troop, and District on the cover page.

CITIZENSHIP IN THE NATION

Prework: Complete Requirement #8: Name your two U.S. Senators and the member of Congress from your Congressional District. Write a letter to one of these elected officials on a national issue, sharing your view with him or her. Show your letter and any response to your counselor.

Bring list of elected officials and a copy of the letter to first class meeting. (It is suggested that a parent read your letter before mailing.)

Complete these requirements: 2. Do 2 of the following:

- (a) Visit a National Historic Landmark or that is on the National Register of Historic Places,
- (b) Tour your state capitol or the U.S. Capitol,
- (c) Tour a federal facility,
- (d) Choose a national monument that interests you and find out more about it.

Bring the names of the places, the dates you went, what you saw there and why it is important to the first Saturday class. Make sure your name and troop number are on the paper.

CITIZENSHIP IN THE WORLD

This merit badge is for mature Scouts, preferably those who have completed the Eighth Grade.

Prework: Complete Requirement #4c and **bring to class on the first Saturday**; select **TWO** of the following organizations and describe their role in the world:

1. The United Nations
2. The World Court
3. Interpol
4. World Organization of the Scout Movement
5. The World Health Organization
6. Amnesty International
7. The International Committee of the Red Cross
8. CARE
9. European Union

Descriptions should total at least 200 words in length, preferably typed. Be sure to include your name, Troop, and District on the first page. Bring to class on the first Saturday.

COIN COLLECTING

Prework: Complete Requirements #2a–f in written form and #5a and #5b in written form. Please be sure to include your name, Troop, and District on your paper. Bring to class on the first Saturday.

Begin Requirements #6, #7, and #9.

For Requirement #8, do the following:

- a) Identify the people depicted on the following denominations of current U.S. paper money: \$1, \$2, \$5, \$10, \$20, \$50, and \$100. b) Explain “legal tender.”

c) Describe the role the Federal Reserve System plays in the distribution of currency.

COLLECTIONS

Prework: Requirement #1: Prepare a short written report for your counselor, giving a detailed description of your collection, including a short history. Be sure to include why you chose that particular type of collecting and what you enjoy and have learned from your collection.

Note: Collections used for Stamp Collection and Coin Collecting are excluded from eligibility for this merit badge.

COMMUNICATION

Prework: Requirement #5: Attend a public meeting (city council, school board, debate) approved by your counselor where several points of view are given on a single issue. Practice active listening skills and take careful notes of each point of view. Present an objective report that includes all points of view that were expressed, and share this with your counselor.

Complete Requirement #8: Plan a troop or crew court of honor, campfire program, or interfaith worship service. Have the patrol leaders' council approve it, then write the script and prepare the program. Serve as master of ceremonies.

COOKING

Prework: The requirements for this merit badge have been updated and require considerable effort to complete requirements outside on campouts. Scouts should review the merit badge pamphlet and the requirements carefully. *Note: The meals prepared for Cooking merit badge requirements 5, 6, and 7 will count only toward fulfilling those requirements and will not count toward rank advancement. Meals prepared for rank advancement may not count toward the Cooking merit badge. You must not repeat any menus for meals actually prepared or cooked in requirements 5, 6, and 7. Requirement #1, #2, #3, #4 Research these requirements! Requirement #5: Using the MyPlate food guide or the current USDA nutrition model, plan a menu for three full days of meals (three breakfasts, three lunches, and three dinners) plus one dessert. Your menu should include enough to feed yourself and at least one adult, keeping in mind any special needs (such as food allergies) of those to be served. List the equipment and utensils needed to prepare and serve these meals.

Requirement #6: Using the MyPlate food guide or the current USDA nutrition model, plan a menu for your patrol or a similar size group of up to eight youth, including you) for a camping trip. Include five meals AND at least one snack OR one dessert. List the equipment and utensils needed to prepare and serve these meals.

Requirement #7: Using the MyPlate food guide or the current USDA nutrition model, plan a menu for trail hiking or backpacking that includes one breakfast, one lunch, one dinner, and one snack. These meals must not require refrigeration and are to be consumed by three to five people (including you). List the equipment and utensils needed to prepare and serve these meals. Then do the following: You may do this before first session or between sessions. You do not need to do a backpacking trip to complete this. Take a short hike with your leaders or parents. Take pictures and bring your documentation.

CRIME PREVENTION

Prework: Requirement #2: Prepare a journal from various sources that address crime and crime prevention efforts in your community.

Requirement #7: Do **ONE** of the following: (a) Assist in the planning and organization of a crime prevention program in your community such as Neighborhood Watch, Community Watch, or Crime Stoppers. Explain how this program can benefit your neighborhood. **OR** (b) With your parent's and counselor's approval, visit a jail or detention facility or a criminal court hearing. Discuss your experience with your counselor.

DIGITAL TECHNOLOGY

Prework: Complete Requirement #1 and bring your current, up-to-date Cyber Chip card to class on the 1st Saturday.

Complete Requirement #2a: Give a brief report on the history of the changes in digital technology over time. (In your report) discuss with your counselor how digital technology in your lifetime compares with that of your parents', grandparents', or other adult's lifetime.

Complete Requirement #2b: Describe the kinds of computers or devices you imagine might be available when you are an adult.

Requirement #6: Choose three of the project options, copy files to a backup device and share the finished projects with the counselor by the second Saturday.

DOG CARE

Prework: Start on Requirement #4 immediately: For two months, keep and care for your dog.

*Maintain a log of your activities during this period that includes these items: feeding schedule, types of food used, amount fed, exercise periods, training schedule, a weekly body weight record, grooming and bathing schedules, veterinary care, if necessary, and costs. Also include a brief description of the type of housing/shelter arrangements you have for your dog. (Note: Work done for other merit badges cannot be used for this requirement.) Refer to Dog Care Merit Badge pamphlet.

DRAFTING

Prework: they should learn to read a ruler in 1/8" increments before first session.

ELECTRICITY

Prework: Complete Requirement #8: On a floor plan of a room in your house, make a wiring diagram of lights, switches and outlets. Show which fuse or circuit breaker protects each one.

Req. 9a. Use the information in the Electricity Merit Badge pamphlet. **Bring diagram to class on the first Saturday.**

Be prepared to explain the following electrical terms: volt, ampere, watt, ohm, resistance, potential difference, rectifier, rheostat, conductor, ground, circuit, and short circuit. **Hint: Study the merit badge book, pages 28 thru 31.**

EMERGENCY PREPAREDNESS

Prework: Complete Requirement #1: Earn the First Aid Merit Badge. Bring proof such as copy of First Aid merit badge blue card or signed note from Scout leader.

Complete Requirement #8b: Prepare and **bring to the first class** the following:

- Prepare a personal emergency service pack for a mobilization call.
- Prepare a family kit (suitcase or waterproof box) for use by your family in case of an emergency evacuation.

Contents of both are listed in the Emergency Preparedness Merit Badge pamphlet.

A single empty water container may be substituted for the actual water in the kit brought to class.

ENERGY

Prework: Complete Requirement #1a: Find an article on the use of conservation of energy. Discuss with your counselor what in the article was interesting to you, the questions it raises, and what ideals it addresses that you do not understand.

ENGINEERING

Prework: Requirement #2: Select an engineering achievement that has had a major impact on society. Use the resources available to you to research it. Tell your counselor about the engineer(s) who made it possible, the special obstacles they had to overcome, and how this achievement has influenced the world today.

FAMILY LIFE

Prework: Start on Requirement #3 **immediately**: Prepare a list of your regular home duties or chores (**at least five**) and do them for 90 days. Keep a record of how often you do each of them. Suggest using table in Family Life Merit Badge pamphlet. **Note: Do not include such items as sports, practicing, homework, etc. as duties.**

Requirements 4, 5, 6)

Note: This merit badge covers mature subject matter, i.e., premarital sex, abstinence, becoming a parent, etc. It is recommended for Scouts age 14 and over.

FINGERPRINTING

FIRE SAFETY

Prework: Read the Home Safety pages in the Fire Safety Merit Badge pamphlet. Complete the following portion of Requirement #6: Conduct a home safety survey with the help of an adult. Use of forms in the merit badge pamphlet is suggested. Complete Requirement #6a: Draw a home fire escape plan, create a home fire drill schedule, and conduct a home fire drill. See example in merit badge pamphlet. Bring both the survey and escape plan to class on the first Saturday.

FIRST AID

Prework: Due to the fact that we hold class the entire morning, it is recommended the **Scouts bring a small water bottle containing only water**. Bring the First Aid Merit Badge pamphlet to class each day.

The following requirements must be completed prior to beginning class:

- Be First Class or above in rank or have completed and signed off all the first aid requirements for Tenderfoot, 2nd Class, and 1st Class ranks. **Bring your Boy Scout Handbook to class as proof.**
- The First Aid Merit Badge pamphlet must be read prior to the first Saturday of class. Be sure to obtain the most recent book (requirements were revised in January 2015).
- Requirement #2d: Prepare a first-aid kit for your home. Use list in found in Merit Badge pamphlet. **Bring to class on the first Saturday.**

FLY FISHING

GAME DESIGN

Prework: Requirement #5: Design a new game. Any game medium or combination of mediums is acceptable.

Requirement #6.

Record your work in a game design notebook.

- a. Write a vision statement for your game. Identify the medium, player format, objectives, and theme of the game. If suitable, describe the setting, story, and characters.
- b. Describe the play value.
- c. Make a preliminary list of the rules of the game. Define the resources. d.

Draw the game elements.

Do not begin creating prototype. You must have your merit badge counselor's approval of your concept before you begin creating the prototype.

Note: If you design a video game, you will need to complete the programming for the game so that it can actually be played by the counselor and others in order to meet the requirement.

GENEALOGY

Prework: Requirement #4b: Obtain at least one genealogical document showing proof of some information on your pedigree chart or family group records. This document may be located in your home, a courthouse, an archive or library, etc.

Bring at least one genealogical document (copy preferred) showing proof of some information that will be on your family chart, e.g. birth certificate, marriage certificate, death certificate; to class on the first Saturday.

Also bring to the class on the first Saturday a list of your family (parents, siblings, grandparents, aunts, uncles, etc.) including known dates of birth, marriage, and death.

GEOCACHING

Prework: Complete Requirement #9: Plan a geohunt for a youth group such as your troop or a neighboring pack, at school, or your place of worship. Choose a theme, set up a course with at least four waypoints, teach the players how to use a GPS unit, and play the game. Tell your counselor about your experience, and share the materials you used and developed for this event. Each Scout should have a GPS Device to bring to class.

GEOLOGY

Prework: Complete Requirement #2: Pick three resources that can be extracted or mined from Earth for commercial use. Discuss with your counselor how each product is discovered and processed.

Complete Requirement 4b: Find out about three career opportunities available in geology. Pick one and find out the education, training, and experience required for the profession. Discuss this with your counselor, and explain why this profession might interest you

Discussion should be a report, preferably typed. Be sure to include your name, Troop, and District on the first page. Bring to class on the first Saturday.

INVENTING

Note: Instructors prefer that Scouts are at least 13 years old and/or First Class or above. Scouts are expected to arrive prepared to discuss their work *in detail* with the counselors. We strongly suggest writing notes in the Merit Badge Workbook or a separate notebook to aid the Scout in recalling what they studied.

Prework: Review the requirements as laid out in the Merit Badge Workbook. To prepare for the 1st session, study the Inventing Merit Badge pamphlet to learn details about requirements 1, 3, 4, and 9. Arrive prepared to discuss your learning in detail. Also, prepare for Requirement #5 (improving a specific piece of camp equipment). Come prepared with your recommendations and any necessary sketches to illustrate them. It will be helpful if you bring an example of the current camp equipment you want to improve upon. We will initially discuss your ideas during the 1st session and get into more detail in the 2nd.

During the 1st session, we will also share prework that must be completed prior to the 2nd and 3rd sessions.

JOURNALISM

LAW

Prework: Complete Requirement #3: Tell what civil law is; tell what criminal law is. Tell the main differences between them. Give examples of each.

LEATHERWORK

MEDICINE

Prework: Complete Requirement #2: Explain the Hippocratic Oath to your counselor, and compare the original version to a more modern one. Discuss to whom those subscribing to the original version of the oath owe the greatest allegiance.

Complete Requirement #7a: visit a physician's office

MODEL DESIGN & BUILDING

Note that models are to be physically built, three-dimensional models – graphic models do not fulfill the requirements.

Prework: Complete Requirement #2: Explain the uses for each of the following types of models: (1) architectural, (2) structural, (3) process, (4) mechanical, and (5) industrial. Do research into the different types of materials that could be used in making these models.

Report should be at least 200 words, and preferably typed. Be sure to include your name, Troop, and District on the front page. Bring to class on the first Saturday.

MOVIEMAKING

[Note: Scouts that have earned Cinematography should NOT take Moviemaking. Same badge, different name.]

Prework: Complete Requirement #3b: Explain to your counselor the elements of the zoom lens and three important parts.

MUSIC

Important note regarding Requirement #1: The playing and sight-reading skills needed for this performance suggest at least two years of experience playing with your school band, orchestra, or ensemble or singing with a choral group. The Scout may also have gained this experience by studying with a private music teacher. The Scout must choose a piece, which the counselor approves, to play or sing in class. The Scout must demonstrate good technique, phrasing, tone, rhythm and dynamics which may not be evident in those just beginning to play an instrument (those with less than two years experience). Performances will take place in

sessions 2 and 3.

PLEASE NOTE: THE SCOUT MUST BE ABLE TO READ MUSIC.

Also note: Music MB is not a tutoring class. The scout must demonstrate proficiency.

Prework: Complete Requirement #3: Do **TWO** of the following:

a. Go to a classical or semi classical musical performance or listen to three hours of such programs on radio, television, compact discs, tapes, records, or videos. Report what you heard.

Name the composers, artists, and conductors. Know the story of any program music or opera you heard. Discuss how you feel about the music. **Report should be typed and at least 300 words. Your name, Troop, and District should appear on the first page.**

b. Interview your parents and grandparents about music. Find out what the most popular music was when they were your age. Find out what their favorite music is now, and listen to three of their favorite tunes with them. How do their favorites sound to you? Had you ever heard any of them: Play three of your favorite songs for them, and explain to them why you like these songs. Ask them what they think about your favorite music. **Report should be typed and at least 300 words. Your name, Troop, and District should appear on the first page.**

c. Serve for six months as a member of a school, church, Scout Troop, or other local musical organization, or perform as a soloist in public six times. **Bring note from your Scout leader, parent, church leader, or teacher verifying the completion of this requirement**

List five people who are important in the history of American music and explain to your counselor why they continue to be influential. Include at least one composer, one performer, one innovator, and one person born over 100 years ago. **Report should be typed and at least 300 words. Your name, Troop, and District should appear on the first page**

NUCLEAR SCIENCE

Recommended age 13

Prework: Complete Requirement #1b: Describe the hazards of radiation to humans, the environment, and wildlife. Explain the difference between radiation exposure and contamination. In your explanation, discuss the nature and a magnitude of radiation risks to humans from nuclear power, medical radiation (e.g., chest or dental X-ray), and background radiation including radon. Explain the ALARA principle and measures required by law to minimize these risks.

PERSONAL MANAGEMENT

Prework: *Immediately* start Requirement #2a: Prepare a budget reflecting your expected income (allowance, gifts, wages,), expenses, and savings. Track your actual income, expenses, and savings for 13 consecutive weeks. (*It is suggested you use the forms provided in the Personal Management Merit Badge pamphlet.*)

Note: Budget must be prepared BEFORE tracking actual income and expenses\

PETS

Prework: Present evidence that you have cared for a pet for four months. Work done for other merit badges cannot be used for this requirement. Bring evidence to the class on the first Saturday.

PHOTOGRAPHY

Note: Bring digital camera to first class. (NO camera phones/tablets.)

Prework: This merit badge requires the Scout to provide photographs of their own, specifically made for completion of the requirements; access to a digital camera with versatile controls is

strongly recommended.

Completion of the Cyber Chip is the first requirement of this merit badge. Therefore, submitting work via email is highly recommended. With adult help, the Scout should send an email addressed to: photo.mbc.sycamore@gmail.com Within the email, include first and last names and Troop number; provide the scout's writing and/or attachments for the following:

Complete Requirement 1: Safety. Do the following:

- a. Explain the most likely hazards you may encounter while working with photography and what you should do to anticipate, mitigate, prevent, and respond to these hazards. Explain how you would prepare for exposure to environmental situations such as weather, sun, and water.
- b. Attach a picture of your current and up-to-date Cyber Chip card.

Complete Requirement 3: Discuss with your counselor the differences between a film camera and a digital camera. Describe how computer software allows you to make adjustments to a digital photograph after it is taken.

Complete Requirement 8: Careers. Do the following:

Identify three career opportunities in photography. Pick one and explain to your counselor how to prepare for such a career. Discuss what education and training are required, and why this profession might interest you.

Discussion should be typed. Be sure to include your name, Troop, and District on the first page. Bring to class on the first Saturday.

PLUMBING

Prework: Complete Requirement #2: Do the following (use info in Plumbing Merit Badge pamphlet as a guide):

- a. Make a drawing and explain the way the hot- and cold-water supply system in your home or that of a neighbor works. Tell how you would make it safe from freezing. (50 word minimum)
- b. Make a drawing and explain the drainage system of the plumbing in a house. Show and explain the use of drains and vents. (**50 word minimum**)

Complete Requirement #8: Do the following (bring a signed note from an adult verifying that you have done this requirement):

- a. Replace a washer in a faucet.
- b. Clean out a sink or lavatory trap.

PUBLIC HEALTH

Two field trips are associated with this merit badge for Requirements #5a and #5b.

Prework: Complete Requirements #2a and 2b: Do the following:

- a. Explain the meaning of immunization.
- b. Name five diseases against which a young child should be immunized and two diseases against which you should be immunized periodically.

Bring completed requirement in written form to class the first Saturday. Be sure to include your name, Troop, and District on the first page.

Prework: 7 a OR b

PUBLIC SPEAKING

Prework: Preparation for Requirement #1: Give a three- to five-minute introduction of yourself to an audience such as your troop, class at school, or some other group. **Be prepared to give an impromptu talk of at least 2 minutes at the first session, as well as give a 3-5 minute introductory talk about yourself.**

Scouts must have read the Public Speaking Merit Badge pamphlet and bring it to class on the first Saturday.

RADIO

Scouts must read the Radio Merit Badge pamphlet and bring it to class on the first Saturday. (Note: Be sure to get the most recent version of the pamphlet; requirements were last updated in 2017.)

Note: This merit badge is not difficult but can be a challenge to first year Scouts. Please use discretion when recommending this badge to your Scouts.

Prework: Complete Requirement #3: Do the following:

- a. Draw a chart of the electromagnetic spectrum covering 100 kilohertz (kHz) to 1000 megahertz (MHz).
- b. Label the MF, HF, VHF, UHF, and microwave portions of the spectrum on your diagram.
- c. Locate on your chart at least eight radio services such as AM and FM commercial broadcast, Citizens Band (CB), television, amateur radio (at least four ham radio bands), and public service (police and fire).

Report, excluding drawing and photos, should be written (typed preferred) and be a minimum of 100 words. Be sure to include your name, Troop, and District on the first page. Bring to class on the first Saturday.

RAILROADING

Prework: None.

READING

Start Requirement #1b: With the assistance of your merit badge counselor or a librarian, select **six** books of **four** different types (such as poetry, drama/plays, fiction, non-fiction, biographies, etc.). Ask your librarian or counselor about award-winning books that are recommended for readers your age and include at least one of those titles.

Note: The more reading you complete before the Challenge, the more likely you are to finish the merit badge by the end of the Challenge.

ROBOTICS

Important note: The Robotics Merit Badge requires the ability to logically program your robot. Counselors recommend previous exposure to programming to be successful with this badge. **While assistance will be given, counselors will not be teaching programming skills.**

Cost: \$5 to cover replacement of materials in robotics kit.

Prework: Complete Requirement #1: **Safety**. Do the following:

- a. Explain the most likely hazards you may encounter while working with robots and what you should do to anticipate, mitigate and prevent, and respond to these hazards. Describe the appropriate safety gear and clothing that should be used when working with robotics.
- b. Discuss first aid and prevention for the types of injuries that could occur while participating in robotics activities and competitions, including cuts, eye injuries, and burns (chemical or heat).

Complete Requirements #2a and #2b. **Robotics Industry**. Discuss the following:

- a. The kinds of things robots can do and how robots are best used today.
- b. The similarities and differences between remote-control vehicles, telerobots, and autonomous robots.

Complete Requirement #3: **General Knowledge**. Discuss with your counselor three of the five major fields of robotics (human-robot interface, mobility, manipulation, programming, sensors) and their importance to robotics development. Discuss either the three fields as they relate to a single robot system OR talk about each field in general. Find pictures or at least one video to aid in your discussion.

Complete Requirement #7: **Careers**. Name three career opportunities in robotics. Pick one and find out the education, training, and experience required for this profession. Discuss this with your counselor, and explain why this profession might interest you.

Bring completed requirements in written form to class the first Saturday. Each discussion topic should be in your own words, typed, and a minimum of 200 words. Be sure to include your name, Troop, and District on the first page.

SAFETY

Prework: Read the section of the Safety Merit Badge pamphlet on "safety in your home." Use the check list in the book (or other similar list) to COMPLETE the following PRIOR TO THE FIRST SESSION:

- a. Complete Requirement #2a: Using a safety checklist approved by your counselor, make an inspection of your home. Identify any hazards found and explain how these can be corrected. Be prepared to discuss the hazards found and methods to correct them. Bring completed checklist and hazard discussion to class the first Saturday.
- b. Collect information and news articles for Requirements 1a, 1b, and 1c.

SALESMANSHIP

SEARCH & RESCUE

Prework: Requirement #5

SPACE EXPLORATION

Prework: Complete Requirement #5: Do **TWO** of the following:

- a. Discuss with your counselor an unmanned space exploration mission and an early manned mission. Tell about each mission's major discoveries, its importance, and what we learned from it about the planets, moons, or regions of space explored. **(Report should be typed and a minimum of 300 words. Be sure to include your name, Troop, and District on the first page. Bring to class on the first Saturday.)**
- b. Using magazine photographs, news clippings, and electronic articles (such as the Internet), make a scrapbook about a current planetary mission. **(Item should be a minimum of 6 pages. Be sure to include your name, Troop, and District on the first page. Bring to class on the first Saturday.)**
- c. Design an unmanned mission to another planet or moon that will return samples of its surface to Earth. Name the planet or moon your spacecraft will visit. Show how your design will cope with the conditions of the planet's or moon's environment. **(Report, excluding drawing and photos, should be written (typed preferred)**

Scouts must have read the Space Exploration Merit Badge pamphlet and bring it to class. Classroom discussion will be centered on what you read in the book.

SURVEYING

Prework: Read the MB Pamphlet and be prepared to discuss Requirements #1, #7, and #8. Recommended for Scouts age 13 and up.

Dress warm as we will be doing some work outside.

SUSTAINABILITY

Prework: Complete Requirement #1: Before starting work on any other requirements for this merit badge, write in your own words the meaning of sustainability. Explain how you think conservation and stewardship of our natural resources relate to sustainability. Have a family meeting, and ask family members to write down what they think sustainability means. Be sure to take notes. You will need this information again for Requirement #5.

WEATHER

Prework: Requirement #9: Do ONE of the following:

a. Make one of the following instruments: wind vane, anemometer, rain gauge, and hygrometer. Keep a daily weather log for one week using information from this instrument as well as from other sources such as local radio and television stations or NOAA Weather Radio. The following information should be recorded at the same time every day: wind direction and speed, temperature, precipitation, and types of clouds. Be sure to make a note of any morning dew or frost. In the log, also list the weather forecasts from radio or television at the same time each day and show how the weather really turned out.

Bring log and weather instrument to class on the first Saturday.

b. Visit a National Weather Service office or talk with a local radio or television weathercaster, private meteorologist, local agricultural Extension service office, or university meteorology instructor. Find out what type of weather is most dangerous or damaging to your community. Determine how severe weather and flood warnings reach the homes in your community.

Obtain a signed note on the stationery of the office visited that you completed this requirement and bring to the first class on Saturday.

Start Requirement #10a or 10b by completing the outline mentioned in this requirement. Bring a copy of the written outline to the first meeting for approval by the Counselor.

Complete Requirements #1-#5: These requirements must be completed before Scouts can participate in an off-site lab of about 4 hours where Scouts will perform welding in a shop environment. The off-site lab is required to complete the merit badge.

WOOD CARVING

Cost: \$15.00 for carving knife

Prework: BRING TOTIN' CHIP CARD EACH SATURDAY.

Read the Wood Carving Merit Badge pamphlet before the first session.

Note: Recommended age 13 Sufficient hand strength and manual dexterity is required to be successful with this merit badge.

WOODWORK

Prework: Complete Requirement #2a: Describe how timber is grown, harvested, and milled. Tell how lumber is cured, seasoned, graded, and sized.

Report should be at least 200 words in length, preferably typed. Be sure to include your name, Troop, and District on the first page. Bring to class on the first Saturday