

2016 MiSci Scouts Workshop Prerequisites

Cub Scouts

Tiger Elective Adventures - Sky is the Limit Loop

Requirement Fulfilled Before Workshop (Pre-requisite):

- 1) With proper supervision, go outside and observe the night sky. Talk about the objects you see or might see.
- 3) Observe in the sky or select from a book or chart two constellations that are easy to see in the night sky. With your adult partner, find out the names of the stars that make up the constellation and how the constellation got its name. Share what you found with your den.
- 4) Create and name your own constellation. Share your constellation with your den.
- 6) Find out about two different jobs related to astronomy. Share this information with your den.
- 7) Find out about two astronauts who were Scouts when they were younger. Share what you learned with your den.

Tiger Elective Adventures – Curiosity, Intrigue, and Magical Mysteries Loop

Requirement Fulfilled Before Workshop (Pre-requisite):

- 1) Learn a magic trick. Practice your magic trick so you can perform it in front of an audience.
- 2) Create an invitation to a magic show
- 3) With your den or with your family, put on a magic show for an audience.

Wolf Elective Adventures – Motor Away Loop

All Requirements fulfilled upon completion of the workshop.

Wolf Elective Adventures – Air of the Wolf Loop

Requirement Fulfilled Before Workshop (Pre-requisite):

- 2A) With other members of your den, go outside and record sounds you hear. Identify which of these sounds is the result of moving air.
- 3A) Explain the rules for safely flying kites.
- 4) With your family, den, or pack, participate in a kite derby, space derby, or rain gutter regatta. Explain how air helps the vehicle move.

Bear Elective Adventures – Forensics Loop

Requirement Fulfilled Before Workshop (Pre-requisite):

- 1) Talk with our family and den about forensics and how it is used to help solve crimes.
- 6) Visit the sheriff's office or police station in your area. Find out how officers collect evidence.
- 7) Learn about different jobs in the forensic science. Choose two, and find out what is required to work in those jobs. Share what you learned with your den.
- 8) Learn how animals used to gather important evidence. Talk about your findings with your den.

Bear Elective Adventures – Robotics Loop

Requirement Fulfilled Before Workshop (Pre-requisite):

- 1) Identify six tasks performed by robots.
- 2) Learn about some instances where a robot could be used in place of a human for work. Research one robot that does this type of work, and present what you learn to your den.

Webelos and Arrow of Light Elective Adventures – Adventures in Science Badge

Requirement Fulfilled Before Workshop (Pre-requisite):

- 1) An experiment is a “fair test” to compare possible explanations. Draw a picture of a fair test that shows what you need to do to test a fertilizer’s effect on plant growth.
- 2) Prepare three questions, prior to your visit to the MiSci, where you will talk to a scientist about his or her work.

Do One of the Following:

- Carry out the experiment your plant experiment. Report what you learned about the effect of fertilizer on the plants that you grew.
- Carry out the plant experiment, but change the independent variable. Report the results about the effect of changing the variable on the plants that you grew.
- Study the night sky. Sketch the appearance of the North Star (Polaris) and the Big Dipper (part of the Ursa Major constellation) over at least six hours. Describe what you observed, and explain the meaning of your observations.
- Read a biography of a scientist. Tell your den leader or the other members of your den what the scientist is famous for and why his or her work is important.

Webelos and Arrow of Light Elective Adventures – Engineer Badge

Requirement Fulfilled Before Workshop (Pre-requisite):

- 1) Pick one type of engineer. With the help of the Internet, your local library, or a local engineer you may know or locate, discover and record in your book three things that describe what that engineer does. (Be sure to have your Webelos den leader, parent, or guardian’s permission to use the Internet.) Share your findings with your Webelos den.
- 2) Learn to follow engineering design principles by doing the following:
 - a. Examine a set of blueprints. Using these as a model, construct your own set of blueprints or plans to design a project.
 - b. Using your blueprints or plans from your own design, construct your project.
 - c. Share your project with your Webelos den.
- 3) Explore other fields of engineering and how they have helped form our past, present, and future.

Webelos and Arrow of Light Elective Adventures – Moviemaking Badge

Requirement Fulfilled Before Workshop (Pre-requisite):

- 1) Write a story outline describing a real or imaginary Scouting adventure. Create a pictured storyboard that shows your story.

Boy Scouts – Environmental Science Merit Badge

Requirements Fulfilled Before Workshop (Pre-requisites):

1. Make a time line of the history of environmental science in America. Identify the contribution made by the Boy Scouts of America to environmental science. Include dates, names of people or organizations, and important events.
2. Define the following terms: population, community, ecosystem, biosphere, symbiosis, niche, threatened species, endangered species, extinction, brownfield, ozone, nonpoint source, hybrid vehicle, fuel cell. (Note: other terms not listed here will be defined during the workshop.)
3. Do the following:
 - e. Endangered Species
 - ii. Do research on one species that was endangered, threatened, or of special concern that has now recovered. Find out how the organism recovered, and what its new status is. Write a 100-word report on the species and discuss it with your counselor.
4. Choose two outdoor study areas that are very different from one another (e.g., hilltop vs. bottom of a hill; field vs. forest; swamp vs. dry land). For BOTH study areas, do the following:
 - a. Mark off a plot of 4 square yards in each study area, and count the number of species found there. Estimate how much space is occupied by each plant species and the type and number of non-plant species you find. Write a report that adequately discusses the biodiversity and population density of these study areas. Discuss your report with your counselor.
5. Using the construction project provided or a plan you create on your own, identify the items that would need to be included in an environmental impact statement for the project planned.
6. Find out about three career opportunities in environmental science. 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.

***Note: Scouts will receive a workbook to help guide completion of these requirements upon registration for the workshop.**

Boy Scouts – Astronomy Merit Badge

Requirements to be fulfilled before Workshop (Pre-requisites):

1. Do the following:
 - a. Explain to your counselor the most likely hazards you may encounter while participating in astronomy activities, and what you should do to anticipate, help, prevent, mitigate, and respond to these hazards.
 - b. Explain first aid for injuries or illnesses, such as heat and cold reactions, dehydration, bites and stings, and damage to your eyes that could occur during observation.
 - c. Describe the proper clothing and other precautions for safely making observations at night and in cold weather. Tell how to safely observe the Sun, objects near the Sun, and the Moon.
2. Explain what light pollution is and how it and air pollution affect astronomy.
5. Do the following:
 - c. Describe the motion of the planets across the sky.
 - d. Observe a planet and describe what you saw.
6. Do the following:
 - a. Sketch the face of the moon, including at least five seas and five craters. Label these landmarks.

- b. Sketch the phase and the daily position of the Moon at the same hour and place, for four days in a row. Include landmarks on the horizon such as hills, trees, and buildings. Explain the changes you observe.
 - c. List the factors that keep the moon in orbit around Earth.
7. Do the following:
- c. Identify at least one red star, one blue star, and one yellow star (other than the Sun). Explain the meaning of these colors.
9. Find out about three career opportunities in astronomy. Pick one and find out about the education, training, and experience required for this profession. Discuss this with your counselor, and explain why this profession might interest you.

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Boy Scouts – Robotics Merit Badge

Requirements Fulfilled Before Workshop (Pre-requisites):

1. Safety. Do each of the following:
 - a. Explain to your counselor 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).
2. Robotics industry. Discuss the following with your counselor:
 - 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.
 - c. Three different methods robots can use to move themselves other than wheels or tracks. Describe when it would be appropriate to use each method.
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 your discussion.
6. Competitions. Do ONE of the following.
 - a. Attend a robotics competition and report to your counselor what you saw and learned about the competition and how teams are organized and managed.
 - b. Learn about three youth robotics competitions. Tell your counselor about these, including the type of competition, time commitment, age of the participants, and how many teams are involved.
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.

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Brownies Girl Scouts – Inventor Badge

Requirement Fulfilled Before Workshop (Pre-requisite):

Step 3: Make a needs list

Choices – Do ONE of the following:

- Mornings.** Watch a brother, sister, or a parent get ready for school or work. Do they wake up on time? Is their alarm clock loud enough? Is there enough time to eat breakfast?
OR
- Lunch at school.** Watch how lunch happens in the cafeteria at school. Are the lines long? Are the chairs too high? Are the sandwiches too soggy?
OR
- Brownie meeting.** They're always fun – now imagine what could make them even better! Does every girl feel included? Can everyone hear each other? Do meetings feel special?

Brownies Girl Scouts – Senses Badge

All Requirements fulfilled upon completion of the workshop.

Brownies Girl Scouts – Bugs Badge

All Requirements fulfilled upon completion of the workshop.

Junior Girl Scouts – Entertainment Technology Badge

Requirement Fulfilled Before Workshop (Pre-requisite):

Step 2: Dig into video game development

Choices – Do ONE of the following:

- Use a free downloadable program.** With these programs, you can create an interactive story or game using characters they provide. The Massachusetts Institute of Technology has a great one called Scratch, or try the Carnegie Mellon University version, called Alice. Share your creation with friends.
OR
- Go onto an interactive site.** There are a lot of how-to-be-a-programmer sites out there that walk you through the steps of game programming (“Interactive Logo” and “Challenge You” are two to try). Check one out and do your best to build a game!
OR
- Talk to a developer!** Ask someone in the video game field to share their portfolio and creative process with you. You could invite a student, professor, or professional to chat with your group, or see if you can visit a studio.

Juniors Girl Scouts – Digital Photo Badge

Requirement Fulfilled Before Workshop (Pre-requisite):

Choices – Do ONE of the following:

- **Interview a local photographer or photography student.** To find a professional photographer in your area, consider calling the local paper or a nearby portrait studio. A local community college or arts center might have photography students who could offer some tips and tricks.
OR
- **Visit a camera store.** One way to learn about digital cameras is to get your hands on different kinds. Visit a local store that sells cameras, and ask the salesperson to teach you about the models that are available. Ask what makes some cameras better than others and which their favorite is.
OR
- **Teach yourself the basics.** Team up with an adult and spend two hours reading about and watching videos on both the basics and tips on how to make the most of a digital camera.

Juniors Girl Scouts – Detective Badge

All Requirements fulfilled upon completion of the workshop.

Juniors Girl Scouts – Flowers Badge

Requirement Fulfilled Before Workshop (Pre-requisite):

Step 1: Uncover the science of one flower

Choices – Do ONE of the following:

- **Go on a flower hunt.** Find your flower and five other kinds that you can name growing around your neighborhood. Don't pick them, but use a magnifying glass and get up close to see more. Record or sketch what you see in your botanist's notebook.
OR
- **Grow your own flower.** Plant a seed or a bulb. Grow it inside or outside, but plant it in the right season and tend to it until it blooms.
OR
- **Talk to a real botanist and learn more.** Interview a botanist, perhaps from a garden shop or at a college or university. Ask about flowers and why they became a flower scientist. Maybe they can show you flowers in books or in person.