



# Robotics



## Merit Badge Workbook

This workbook can help you but you still need to read the merit badge pamphlet.

This Workbook can help you organize your thoughts as you prepare to meet with your merit badge counselor

**Merit Badge Counselors may not require the use of this or any similar workbooks.**

You still must satisfy your counselor that you can demonstrate each skill and have learned the information.

You should use the work space provided for each requirement to keep track of which requirements have been completed, and to make notes for discussing the item with your counselor, not for providing full and complete answers.

If a requirement says that you must take an action using words such as "discuss", "show", "tell", "explain", "demonstrate", "identify", etc, that is what you must do.

No one may add or subtract from the official requirements found on Scouting.org.

The requirements were last issued or revised in 2011 • This workbook was updated in February 2024.

Scout's Name: \_\_\_\_\_ Unit: \_\_\_\_\_

Counselor's Name: \_\_\_\_\_ Phone No.: \_\_\_\_\_ Email: \_\_\_\_\_

Please submit errors, omissions, comments or suggestions about this **workbook** to: [Workbooks@USScouts.Org](mailto:Workbooks@USScouts.Org)

Comments or suggestions for changes to the **requirements** for the **merit badge** should be sent to: [Merit.Badge@Scouting.Org](mailto:Merit.Badge@Scouting.Org)

**NOTE: Requirements 4 and 5 require you to document your work in a robot engineering notebook. That notebook should be separate from and in addition to this workbook.**

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.

Hazard:	
Anticipate:	
Mitigate & Prevent:	
Respond:	

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Hazard:

Anticipate:

Mitigate & Prevent:

Respond:

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).

Cuts,:


Eye injuries:


Chemical Burns:


Heat burns:


2. **Robotics industry.** Discuss the following with your counselor:

a. The kinds of things robots can do and how robots are best used today.

What they can do:


How they are best used:


b. The similarities and differences between remote-control vehicles, telerobots, and autonomous robots.

Similarities:


Differences:


c. Three different methods robots can use to move themselves other than wheels or tracks.

- 1.
- 2.
- 3.


Describe when it would be appropriate to use each method.

1.	
2.	
3.	

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.

Human-robot interface


Mobility


Manipulation


Programming




5. **Demonstrate.** Do the following:

- a. Demonstrate for your counselor the robot you built in requirement 4.
- b. Share your robot engineering notebook with your counselor. Talk about how well your robot accomplished the task, the improvements you would make in your next design, and what you learned about the design process.

How well your robot accomplished the task:


Improvements you would make:


What you learned:


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.

What you saw:


What you learned:


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.

Competition 1:

Type of competition:

Time commitment:

Age of the participants:

How many teams are involved:


Competition 2:

Type of competition:

Time commitment:

Age of the participants:

How many teams are involved:


