

Space Exploration

Merit Badge Workbook



Merit badges are earned by doing: reading the pamphlet, practicing the skills, and showing your counselor what you have learned.
This workbook gives you a place to organize your notes and track your progress along the way.
Merit badge counselors may not require the use of this or any similar workbook.
You still must satisfy your counselor that you can demonstrate each skill and have learned the information.
Use the space under each requirement to note what you have done and what you want to talk about, not to write out full answers.
When a requirement says discuss, show, tell, explain, or demonstrate, that is what you must do.
No one may add to or subtract from the official requirements found on scouting.org (Guide to Advancement 7.0.4.8).
Scouting America last updated this badge's requirements page on August 5, 2026.
Requirements change from time to time. Double-check scouting.org before you start.

Scout's name: _____ Unit: _____ Date started: _____

Counselor's name: _____ Phone no.: _____ Email: _____

Links marked "Scouting America resources" are the ones Scouting America shares on its official badge page.
Links marked "ScoutSmarts" open the matching part of Cole's guide. This workbook is unofficial and not endorsed by Scouting America.

---

1. Tell the purpose of space exploration and include the following:

(a) Historical reasons

Scouting America resources: The History of Space Exploration (video) · The History of Space Exploration: A Timeline (video) The History of the Space Race (website)

Historical reasons for exploring space

(b) Immediate goals in terms of specific knowledge

ScoutSmarts: Requirement 1b explained

Immediate goals: what we want to learn

(c) Benefits related to Earth resources, technology, and new products

Scouting America resources: How Space Benefits Earth (video) · Space Exploration, Is It Really Worth It? Yes. (video) 10 Surprising Ways Space Exploration Benefits Life on Earth (video) · **ScoutSmarts:** Requirement 1c explained

Area	Benefits I found
Earth resources	
Technology	
New products	

(d) International relations and cooperation

Scouting America resources: The Power of International Collaboration in Space Exploration (video) · **ScoutSmarts:** Requirement 1d explained

International relations and cooperation

Requirement 1 completed on _____ counselor initials _____

2. Design a collector's card, with a picture on the front and information on the back, about your favorite space pioneer. Share your card and discuss four other space pioneers with your counselor.

Scouting America resources: Here's How I Make Custom Trading Cards (video) · How to Make Trading Cards By Hand (video)
ScoutSmarts: Requirement 2 explained

My favorite space pioneer _____

My collector's card, front and back: draw here or attach

Four other space pioneers

Pioneer	What they are known for

Requirement 2 completed on _____ counselor initials _____

3. Build, launch, and recover a model rocket under the supervision of an experienced or qualified person approved by your counselor. Make a second launch to accomplish a specific objective. Identify and explain the following rocket parts:

Safety Note: All scouting activities involving rocket launches should follow the Scouting rocket safety guidelines

Alternative Requirement: If local laws prohibit launching model rockets, do the following activity: Make a model of a NASA rocket. Explain the functions of the parts. Give the history of the rocket.

Scouting America resources: Scouting America Rocket Safety Guidelines (website w/ video)
NASA Rocket Parts—Beginner's Guide (website) · National Association of Rocketry Educational video on model rocketry (website)
ScoutSmarts: Requirement 3 explained

Rocket I built _____ Supervised by _____

My launches

Launch	Date	Objective	What happened and how I recovered it
Launch 1			
Launch 2			

Alternative only: NASA rocket I modeled

Alternative only: its history

(a) Body tube

What it does

(b) Engine mount

What it does

(c) Fins

What they do

(d) Igniter

What it does

(e) Launch lug

What it does

(f) Nose cone

What it does

(g) Payload

What it is

(h) Recovery system

What it does

(i) Rocket engine

What it does

Requirement 3 completed on

counselor initials

Requirements © Scouting America, reproduced verbatim. Unofficial workbook; not endorsed by Scouting America.

4. Discuss and demonstrate each of the following:

Scouting America resources: NASA "Basics of Space Flight" (website)

(a) The law of action-reaction

Scouting America resources: Newton's Law of Motion (website)

My explanation, and how I demonstrated it

(b) How rocket engines work

Scouting America resources: How Rocket Engines Work (website) · Rocket Engines Explained (website)
How Do We Launch Things Into Space (video)

My explanation, and how I demonstrated it

(c) How satellites stay in orbit

Scouting America resources: How Do Satellites Get & Stay in Orbit? (video) · How Do Satellites Stay in Orbit Around the Earth (video)
How Orbit Works: Perpetual Free Fall Explained (video)

My explanation, and how I demonstrated it

(d) How satellite pictures of Earth and pictures of other planets are made and transmitted

Scouting America resources: What Is The Deep Space Network & How Does It Work? (video)
How Do We Communicate with Faraway Spacecraft? (video)
How do Spacecraft Photograph the Planets & get the Images Back to Earth? (video)

My explanation, and how I demonstrated it

Requirement 4 completed on _____ counselor initials _____

5. Do TWO of the following:

☐ **(a)** Discuss with your counselor a robotic space exploration mission and a historic crewed mission. Tell about each mission's major discoveries, its importance, and what was learned from it about the planets, moons, or regions of space explored.

Scouting America resources: Voyager (video) · Putting Man on The Moon in 11 Years | The Apollo Program (video)
NASA SpaceX Crew Dragon Launch (video) · Mars Perseverance Rover (video)

Robotic mission _____ Historic crewed mission _____

Robotic mission: major discoveries, its importance, and what was learned

Historic crewed mission: major discoveries, its importance, and what was learned

☐ **(b)** Using articles from the internet, photographs and text, create a blog, website, or slide show about a current planetary mission or use magazine photographs, news clippings, and articles from the internet to make a scrapbook about a current planetary mission.

ScoutSmarts: Requirement 5b explained

Current planetary mission _____ What I made _____

Main points I covered

☐ **(c)** Design a robotic mission to another planet, moon, comet, or asteroid that will return samples of its surface to Earth. Name the planet, moon, comet, or asteroid your spacecraft will visit. Show how your design will cope with the conditions of the environments of the planet, moon, comet, or asteroid.

Planet, moon, comet, or asteroid I picked _____

How my design copes with the environment

Condition there	How my design copes

How my spacecraft collects samples and returns them to Earth

Sketch of my spacecraft: draw here or attach

Requirement 5 completed on _____ counselor initials _____

6. Describe the purpose, operation, and components of ONE of the following:

☐ **(a)** Space shuttle or any other crewed orbital vehicle, whether government-owned (U.S. or foreign) or commercial

Scouting America resources: First Space Shuttle (video) · How the Space Shuttle Worked (video)
NASA SpaceX Crew Dragon Launch (video) · Soyuz (video)

Vehicle I picked

Purpose

Operation

Components

☐ **(b)** International Space Station

Scouting America resources: What is the International Space Station? (website)
How to Spot the International Space Station (ISS) (website)

Purpose

Operation

Components

Requirement 6 completed on counselor initials

Requirements © Scouting America, reproduced verbatim. Unofficial workbook; not endorsed by Scouting America.

7. Design an inhabited base located within our solar system, such as Titan, asteroids, or other locations that humans might want to explore in person. Make drawings or a model of your base. In your design, consider and plan for the following:

Scouting America resources: How NASA Will Build a City on the Moon (video)

Where my base is located

☐ I made drawings
☐ I made a model

Drawing of my base: draw here or attach

(a) Source of energy

Scouting America resources: You Can't Take It All With You (PDF)

My plan

(b) How it will be constructed

Scouting America resources: How NASA Plans to Build the First Moon Base (video)

My plan

(c) Life-support system

Scouting America resources: Robots Building a Mars Base (video)

My plan

(d) Purpose and function

Scouting America resources: How Robots Will Build on Mars (video)

My plan

Requirement 7 completed on _____ counselor initials _____

8. Explore careers related to this merit badge. Research one career to learn about the training and education needed, costs, job prospects, salary, job duties, and career advancement. Your research methods may include—with your parent or guardian's permission—an internet or library search, an interview with a professional in the field, or a visit to a location where people in this career work. Discuss with your counselor both your findings and what about this profession might make it an interesting career.

Scouting America resources: Astronaut Requirements (website) · So You Want to Be an Aerospace Engineer (video) Should I Become an Aerospace Engineer? (video) · Becoming an Astrobiologist (website)

Careers related to space exploration

Career	What it involves

The career I researched _____ How I researched it _____

What I found out

Topic	My findings
Training and education	
Costs	
Job prospects	
Salary	
Job duties	
Career advancement	

What might make it an interesting career

Requirement 8 completed on _____ counselor initials _____

Counselor sign-off

Your counselor signs your blue card or approves the badge in Scoutbook, and your unit records it. This line is for your own records.

Counselor's signature _____ Date completed _____

Official Scouting America resources

Scouting America resources: Space Exploration merit badge page (requirements and resources) Space Exploration merit badge pamphlet (free PDF) · All merit badges · **ScoutSmarts:** Space Exploration Merit Badge Guide, Part 1 Space Exploration Merit Badge Guide, Part 2

Made by Cole at ScoutSmarts.com, an Eagle Scout who loves helping Scouts.
Spot an error or a requirement change? Tell me at scoutsmarts.com/contact.
Requirement text © Scouting America. Workbook layout © 2026 ScoutSmarts.com, free to copy for Scouting use.