Space Exploration Merit Badge

Northern New Jersey Council Merit Badge Day
November 1st 2025

Councilor:
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Pamphlet:
https://filestore.scouting.org/filestore/Merit_Badge_ReqandRes/Pamphlets/Space%20Exploration.pdf?_gl=1*1x0pjeu*_ga*MTQwMDEzMzcyNS4xNzU2ODI0NDEy*_ga_20G0JHESG4*czE3NjExNTE1MjUkbzE0JGcxJHQxNzYxMTUxODIwJGo2MCRsMCRoMA..*_gcl_au*NTEyNjMxMTk3LjE3NTc0MjU0Njc.&_ga=2.159085562.1517421693.1761148629-1400133725.1756824412

Workbook: http://usscouts.org/mb/worksheets/space-exploration.pdf

Additional Resources for the requirements can be found at the following:
https://www.scouting.org/merit-badges/space-exploration/

Rocket Kit: Each Scout should bring one of the following Estes rocket kits to assemble.

Generic E2X - AMAZON, Zeppelin Hobbies Wayne
Cosmic Cargo - AMAZON, Zeppelin Hobbies Wayne
FireHawk - AMAZON, Zeppelin Hobbies Wayne
Athena Rocket AMAZON
3 Bandits – (3 rockets in one pack) AMAZON, Zeppelin Hobbies Wayne
Trailblazer Trio – (3 rockets in one pack) AMAZON, Zeppelin Hobbies Wayne

You may find these at your local hobby store. One Thing all these models have in common is a Plastic Molded Fin Part. If you find a different kit on your own make sure it has a molded plastic fin for ease of assemble on the Merit badge Day as glue on fins take time to dry.

3 or 4 Pack Rocket Engines

For Generic E2X/Cosmic Cargo/Athena get A8-3 Engines Estes, Zeppelin Hobbies Wayne
For 3 Bandits/TrailbazerTrio/FireHawk Trio get 1/2A3-4T Engines AMAZON or A3-4T Estes , Zeppelin Hobbies Wayne
If you have trouble getting the engines let me know what rocket kit you have and I will try to find compatible engines.

Requirements	Review the pamphlet and be prepared to discuss all the requirement. I have added notes for special items to do before class.
1. Tell the purpose of space exploration and include the following:	
(a) Historical reasons	
(b) Immediate goals in terms of specific knowledge	
(c) Benefits related to Earth resources, technology, and new products	
(d) International relations and cooperation.	
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.	Do Not Choose The Following: Yuri Gagarin, Alan Shepard, John Glenn or Neil Armstrong.
3. Build, launch, and recover a model rocket. Make a second launch to accomplish a specific objective. Identify and explain the following rocket parts: (a) Body tube (b) Engine mount (c) Fins (d) Igniter (e) Launch lug (f) Nose cone (g) Payload (h) Recovery system (i) Rocket engine.	We will build the Rockets in class. See notes above about rocket kits.
4. Discuss and demonstrate each of the following:	
(a) The law of action-reaction	
(b) How rocket engines work	
(c) How satellites stay in orbit	
(d) How satellite pictures of Earth and pictures of other planets are made and transmitted.	
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.	

(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.	
(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.	
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	
(b) International Space Station.	
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:	
(a) Source of energy	
(b) How it will be constructed	
(c) Life-support system	
(d) Purpose and function.	
8. Discuss with your counselor two possible careers in space exploration that interest you. Find out the qualifications, education, and preparation required and discuss the major responsibilities of those positions.	