



Boy Scout Badge Workshop

SPACE EXPLORATION

Welcome to the Schenectady Museum & Suits-Bueche Planetarium! During this workshop, you will explore the museum, see a presentation about the history of space flight, and try out some other activities in order to complete many of the requirements for your Space Exploration Badge.

Space exploration is the search through outer space, by manned and unmanned spacecraft. It became possible through the development of liquid-fueled rocket engines, solid fuel rocket boosters, and Radioisotope Thermoelectric Generators, otherwise known as RTG's. The need for going into space includes advancing scientific research, development of new technology, encouraging international collaboration, and ensuring the future survival of the human race.

We will provide you with all the information you need for many of the badge requirements. Every requirement is listed in the packet, but you will need to complete sections 2, 3 A-I & 7 at home.

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In parentheses you will find the requirement for the Space Exploration Badge that is fulfilled by each activity.



SPACE EXPLORATION

Merit Badge Requirements

- 1) Tell the purpose of space exploration including:**
 - A) Historical reasons.**
 - B) Immediate goals in terms of specific knowledge.**
 - C) Benefits related to Earth resources, technology, and new products.**

- 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.**

- 3) Build, launch, and recover a model rocket.**
 - * If local laws prohibit the launching of 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.Make a second launch to accomplish a specific objective. (Rocket must be built to meet the safety code of the National Association of Rocketry. See "Model Rocketry" chapter). 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**

- 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 the Earth and pictures of other planets are made and transmitted.**

- 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.**
 - B) Using magazine photographs, news clippings, and electronic articles (such as from the Internet), make a scrapbook about a current planetary mission.**
 - 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.**

- 6) Describe the purpose and operation of ONE of the following:**
 - A) Space Shuttle**
 - B) International Space Station**

- 7) Design an inhabited base located on the Moon or Mars. 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.**

Requirements to Complete at Home

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 with your counselor and attach it to this worksheet. Have your counselor initial here once they have seen your card: _____

Discuss four space pioneers with your counselor. Do not use the one you used to make your collector's card. Use the spaces below to find out information about the 4 space pioneers so that you are prepared to share the information with your counselor.

Space Pioneer: _____ Notes: _____

Space Pioneer: _____ Notes: _____

Space Pioneer: _____ Notes: _____

Space Pioneer: _____ Notes: _____

3 A-I. Build, launch, and recover a model rocket. Briefly describe your model, how you built it, the launch, and recover:

* If local laws prohibit the launching of model rockets, do the following activity:

Make a model of a NASA rocket. Briefly describe your model and how you built it:

Identify and explain the functions of the parts:

Part: _____ Function: _____

Part: _____ Function: _____

Part: _____ Function: _____

Part: _____ Function: _____

Part: _____ Function: _____

Part: _____ Function: _____

Part: _____ Function: _____

Part: _____ Function: _____

Part: _____ Function: _____

Part: _____ Function: _____

Scout Name: _____ Unit #: _____ Date: _____

Demonstrate to your counselor that you can identify the following rocket parts. Give an explanation of each rocket part:

Body Tube:

Engine Mount:

Fins:

Igniter:

Launch Lug:

Nose Cone:

Payload:

Scout Name: _____ Unit #: _____ Date: _____

Recovery System:

Rocket Engine:

7 A-D. For this requirement you are to design an inhabited base located on the Moon or Mars. Make drawings or build a model of your base.

A - What will be your bases source of energy?

B - How will your base be constructed?

C - Describe the life-support system(s) your base will have:

D - What will be the purpose and function of your space station?

_____ Complete your drawings or your model of your space station and show them to your counselor.