



SPACE EXPLORATION

Merit Badge Requirements

1) Tell the purpose of space exploration including:

- A) Historical reason.
- B) Immediate goals in terms of specific knowledge.
- C) Benefits related to Earth resources, technology, and new products.

2) Tell about main steps in humanity's movement into space and tell the contributions of these individuals: Jules Verne, K.E. Tsiolkovsky, Robert Goddard, Hermann Oberth, and Werner von Braun.

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.) 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) Discuss what has been learned about the Moon and planets by manned and unmanned spacecraft exploration and the possible benefits of new knowledge. Do TWO of the following:

- A) Construct a data table of recent information about the planets. For each planet, give the important facts, including distance from the sun, period of revolution, rotation, number of moons, etc.
- B) Make a scrapbook of magazine photographs and news clippings about planetary research.
- C) Design a spacecraft that will be sent on a mission to another planet to take samples of its surface and return them to Earth. Name the planet your spacecraft will visit; and, in your design, show how your spacecraft will work and cope with the environment of that planet.

6) Describe the purpose and operation of the space shuttle. Discuss the following:

- A) Main components
- B) Typical mission profile
- C) Payloads

7) Design an Earth-orbiting space station. Make drawings or a model of your station. Within your design, consider and plan the following:

- A) Source of energy
- B) How it will be constructed
- C) Life-support systems
- D) Purpose and function

8) Discuss with your counselor two possible careers in space exploration.

Requirement 1

What is the purpose of space exploration? _____

What is the historical reason for space exploration? _____

What are the immediate goals, in terms of specific knowledge, of space exploration? _____

Requirement 2

Tell about main steps in humanity's movement into space: _____

Tell the contributions to space exploration that the following individuals made:

Jules Verne: _____

K.E. Tsiolkovsky: _____

Robert Goddard: _____

Hermann Oberth: _____

Werner von Braun: _____

_____ Make a second launch to accomplish a specific objective.

State your objective? _____

Was your objective met? YES NO

Does your rocket meet the safety code of the National Association of Rocketry? YES NO (Must be able to answer YES)

****Extra Mile - NOT REQUIRED for Merit Badge***

Briefly describe the safety code of the National Association of Rocketry AND why you think the safety code exists: _____

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: _____

Recovery System: _____

Rocket Engine: _____

You now have three options to choose from to complete this requirement. Select and complete two of the options.

If you selected *Option A*:

Construct a data table of recent information about the planets. For each planet, give important facts, including distance from the sun, period of revolution, number of moons, etc. You can use the chart below or you can create a different one and attach it to this worksheet when you are done. Show the worksheet to your counselor.

Planet	Distance From Sun	Period Of Revolution	Rotation	Number Of Moons	Important Facts	Other

If you selected **Option B**:

_____ Make a scrapbook of magazine photographs and news clippings about planetary research. Show your collection to your counselor.

If you selected **Option C**:

Design a spacecraft that will be sent on a mission to another planet to take samples of its surface and return them to Earth. Draw your spacecraft in the space below: In your design show how your spacecraft will work and cope with the environment of that planet.



What planet will your spacecraft go to? _____

Describe how your spacecraft will work: _____

How will your spacecraft cope with the environment? _____

Requirement 7

For this requirement you are to design an Earth-orbiting space station. You can make drawings or build a model of your station.

What will be your stations source of energy? _____

How will your station be constructed? _____

Describe the life-support system(s) your station will have: _____

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.

Requirement 8

Discuss with your counselor two possible careers in space exploration. Name them below and give a brief description or outline of what you found out about each occupation.

Occupation: _____

Description: _____

Occupation: _____

Description: _____
