Space Exploration

Merit Badge Workbook

This workbook can help you but you still need to read the merit badge pamphlet (book). No one can add or subtract from the Boy Scout Requirements #33215. Merit Badge Workbooks and much more are below: Online Resources.
Workbook developer: craig@craiglincoln.com. Requirements revised: 2005, Workbook updated: September 2008.

Scout's Name: _____ Unit: _____

Counselor's Name: _____ Counselor's Ph #: _____

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

a. Historical reasons _____

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b. Immediate goals in terms of specific knowledge _____

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c. Benefits related to Earth resources, _____

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technology, and new products. _____

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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.

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2 _____

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3 _____

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4 _____

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3. Build, launch, and recover a model 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 the "Model Rocketry" chapter.) Identify and explain the following rocket parts. * ***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.***

a. Body tube _____

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b. Engine mount _____

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c. Fins _____

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d. Igniter _____

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e. Launch lug _____

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f. Nose cone _____

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g. Payload _____

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h. Recovery system _____

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_____

i. Rocket engine _____

_____

_____ **4.**

Discuss and demonstrate each of the following:

a. The law of action-reaction _____

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b. How rocket engines work _____

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c. How satellites stay in orbit _____

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d. How satellite pictures of Earth and pictures of other planets are made and transmitted _____

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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.**_____

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☐ **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, operation, and components of ONE of the following:

☐ **a. Space shuttle**

☐ **b. International Space Station**

Purpose _____

Operation _____

Components _____

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 _____

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c. Life-support system _____

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d. Purpose and function _____

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8. Discuss with your counselor two possible careers in space exploration that interest you.

Career 1 _____

Find out the qualifications, education, and preparation required _____

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and discuss the major responsibilities of those positions._____

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Career 2 _____

Find out the qualifications, education, and preparation required _____

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and discuss the major responsibilities of those positions._____

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Online Resources *(Use any Internet resource with caution and only with your parent's or guardian's permission.)*

Boy Scouts of America: ► scouting.org ► Guide to Safe Scouting ► Age-Appropriate Guidelines ► Safe Swim Defense ► Scout ► Tenderfoot ► Second Class ► First Class 🎬 Rank Videos ► Safety Afloat

Boy Scout Merit Badge Workbooks: usscouts.org -or- meritbadge.org **Merit Badge Books:** www.scoutstuff.org

Requirement Resources

1: Space Exploration: http://en.wikipedia.org/wiki/Space_exploration

2: Historic figures in space exploration: http://meritbadge.org/wiki/index.php/Gallery_of_historic_figures_in_space_exploration

3: Model Rockets: http://en.wikipedia.org/wiki/Model_rocket

4a: NASA – How Things Work: http://www-ksl.stanford.edu/htw/htw-overview.html

4b: How Rocket Engines Work: http://en.wikipedia.org/wiki/Rocket_engine

4c: Satellites: http://en.wikipedia.org/wiki/Satellite

4d: Satellite Imagery: http://en.wikipedia.org/wiki/Satellite_imagery

5: Unmanned Space Missions: http://en.wikipedia.org/wiki/Wikipedia:WikiProject_Unmanned_space_missions
Early & Current Manned Space Missions: http://en.wikipedia.org/wiki/Human_spaceflight

6a: Space Shuttle: http://en.wikipedia.org/wiki/Space_Shuttle

6b: International Space Station: http://en.wikipedia.org/wiki/International_Space_Station

7: Moon Base Station: http://en.wikipedia.org/wiki/Colonization_of_the_Moon
Mars Base Station: http://en.wikipedia.org/wiki/Colonization_of_Mars

8: Space Careers: http://www.space-careers.com/ http://www.faa.gov/education_research/education/careers/
Jobs at NASA: http:// www.jsc.nasa.gov/people/jobs.html http://www.nasajobs.nasa.gov/

General Resources:

Smithsonian National Air and Space Museum: http://www.nasm.si.edu

NASA: http://www.nasa.gov

European Space Agency: http://www.esa.int

Goddard Space Flight Center: http://www.gsfc.nasa.gov

Jet Propulsion Laboratory: http://www.jpl.nasa.gov

Space Center: http://www.spacecenter.org

Marshall Space Flight Center: http://www.msfc.nasa.gov

National Association of Rocketry: http://www.nar.org

Planetary Society: http://www.planetary.org

Am. Inst. of Aeronautics and Astronautics: http://www.aiaa.org

Galileo Scale Model: http://www.jpl.nasa.gov/galileo/model.html

Great Images in NASA: http://grin.hq.nasa.gov

Johnson Space Center: http://www.jsc.nasa.gov

Kennedy Space Center: http://www.ksc.nasa.gov

Junior Engineering Technical Society: http://www.jets.org

National Space Society: http://www.nss.org