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Please submit errors, omissions, comments or suggestions about this **workbook** to: Workbooks@USScouts.Org

Comments or suggestions for changes to the **requirements** for the **merit badge** should be sent to: Merit.Badge@Scouting.Org

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 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, technology, and new products.

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 d. International relations and cooperation.

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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.

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| Front | Back |
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 Share your card and discuss four other space pioneers with your counselor.

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| Your Card |  |
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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 of the *Space Exploration* merit badge pamphlet.)

⬜ *\* 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.*

Identify and explain the following rocket parts.

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| 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 |  |
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 4. Discuss and demonstrate each of the following:

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| 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 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.

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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 a robotic mission to another planet, moon, comet, or asteroid that will return samples of its surface to Earth.

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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.

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 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

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| Purpose |  |
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| Operation |  |
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| Components |  |
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 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:

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| a. | Source of energy |  |
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| 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. Find out the qualifications, education, and preparation required and discuss the major responsibilities of those positions.

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| Career 1 |  |
|  Qualifications |  |
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|  Education |  |
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|  Preparation |  |
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|  Major responsibilities |  |
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| Career 2 |  |
|  Qualifications |  |
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|  Education |  |
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|  Preparation |  |
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|  Major responsibilities |  |
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**When working on merit badges, Scouts and Scouters should be aware of some vital information in the current edition of the *Guide to Advancement* (BSA publication 33088).Important excerpts from that publication can be downloaded from** [**http://usscouts.org/advance/docs/GTA-Excerpts-meritbadges.pdf**](http://usscouts.org/advance/docs/GTA-Excerpts-meritbadges.pdf)**.**

**You can download a complete copy of the *Guide to Advancement* from** [**http://www.scouting.org/filestore/pdf/33088.pdf**](http://www.scouting.org/filestore/pdf/33088.pdf)**.**