Through live interactions with NASA engineers and exploring the Launch Pad and The Lab, complete this worksheet to demonstrate your knowledge of space exploration. This worksheet will not be turned in and for your own use to demonstrate knowledge of space exploration.

**PURPOSE OF SPACE EXPLORATION**

Explain the purpose of space exploration in each of the following areas:

**Benefits related to Earth’s resources & technology** –

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

**Immediate goals in terms of specific knowledge** –

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

**International relations** –

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

**Historical reasons** –

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

On the next page, design a collector’s card, with a picture on the front and information on the back, about your favorite space pioneer.
List four other space pioneers and what they are known for. Make sure to include this information on your collectors card for your other space pioneer.

Pioneer #1 = ______________________________________________________________
Known for = __________________________________________________________________

Pioneer #2 = ______________________________________________________________
Known for = __________________________________________________________________

Pioneer #3 = ______________________________________________________________
Known for = __________________________________________________________________

Pioneer #4 = ______________________________________________________________
Known for = __________________________________________________________________
Draw and label each of the following parts of a rocket your drawing of a rocket. Then define or explain its purpose.

Body Tube = ____________________________________________________
Engine Mount = _________________________________________________
Fins = ___________________________________________________________
Ignitor = _________________________________________________________
Launch Lug = ___________________________________________________
Nose Cone = ____________________________________________________
Payload = _______________________________________________________
Recovery System = ______________________________________________
Rocket Engine = _________________________________________________
Explain each of the following:

The law of action-reaction
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________

How rocket engines work
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________

How satellites stay in orbit
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________

How satellite pictures of Earth and pictures of other planets are made and transmitted
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________

Choose TWO of the following on the next page(s) to complete requirement 5 for Space Exploration Merit Badge.

1. Learn about 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.
Robotic Space Exploration Mission
Major discoveries
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________

Importance
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________

What was learned
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________

Historic Crewed Space Exploration Mission
Major discoveries
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________

Importance
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________

What was learned
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
2. Using magazine photographs, news clippings, and electronic articles (such as from the Internet), make a scrapbook about a current planetary mission.

3. Design a robotic mission to another planet, moon, comet, or asteroid that will return samples of its surface to Earth. Make sure to name the planet/moon/asteroid/comet your spacecraft will visit.

__________________________________________________________________
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________

How will your design will cope with the conditions of the environments of the planet, moon, comet, or asteroid.
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________

On the next page describe the purpose, operation, and components of ONE of the following:
• Space shuttle or any other crewed orbital vehicle, whether government-owned (U.S. or foreign) or commercial
• International Space Station
1. Space shuttle or any other crewed orbital vehicle, whether government-owned (U.S. or foreign) or commercial

Purpose
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________

Operation
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________

Components
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________

2. International Space Station

Purpose
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________

Operation
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________

Components
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________
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.

Explain how will you plan for the following:

Source of energy

__________________________________________________________________
__________________________________________________________________

How it will be constructed

__________________________________________________________________
__________________________________________________________________

Life-support system

__________________________________________________________________
__________________________________________________________________

Purpose and function

__________________________________________________________________
CAREERS IN SPACE EXPLORATION

Explore two possible careers in space exploration that interest you.

**Career #1** = ____________________________________________

Qualifications
__________________________________________________________________
__________________________________________________________________

Education
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________

Preparations
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________

Major Responsibilities
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________

**Career #2** = ____________________________________________

Qualifications
__________________________________________________________________
__________________________________________________________________

Education
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________

Preparations
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________

Major Responsibilities
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________