

Lesson 9: Spacecraft Structure and Design

Engagement Questions:

| | |
|-----------------------|--|
| 3 Facts | |
| 2 Questions | |
| 1 Opinion | |

Exploration Activity:

Rover Communication

Scenario #1

| Materials | Number |
|---------------------------------|--------|
| Satellite | |
| Ground Receiver/ Transmitter | |

Scenario #2

| Materials | Number |
|---------------------------------|--------|
| Satellite | |
| Ground Receiver/ Transmitter | |

Scenario #1

| Trials | Total Seconds on Target in two minutes |
|---------|---|
| Trial 1 | |
| Trial 2 | |
| Trial 3 | |
| Trial 4 | |
| Trial 5 | |

Scenario #2

| Trials | Total Seconds on Target in two minutes |
|---------|---|
| Trial 1 | |
| Trial 2 | |
| Trial 3 | |
| Trial 4 | |
| Trial 5 | |

Exploration Activity:

Spacecraft Design

Before building:

What is the purpose of your space probe (use your article to help you)?

What three things will you need to think about when you build your space probe?

1.

2.

3.

During Building:

What design elements will you build to make sure that your probe always lands bottom down?

After Building:

How does your team's design compare with NASA's Design?

Testing:

Drop your probe from the following heights and record your observations.

| Trial | Height | Scientific Observations |
|---------|--------|-------------------------|
| Trial 1 | 1 foot | |
| Trial 2 | 2 feet | |
| Trial 3 | 3 feet | |

Exploration:

Research and Investigation

| Team Job | Role | Name |
|-----------|--|----------|
| Navigator | Using correct terms, gives the Operator directions | |
| Operator | Operates the mouse and keyboard | |
| Director | Keeps all team members focused and on task | |
| Monitor | Monitors the noise level of the group and watches the time | |
| Recorder | Record their data in their Science Notebooks | Everyone |

How Spacecraft are Built

How Spacecraft Enter an Atmosphere and Land

Scientific Instruments Spacecraft May Carry

Other Facts I found: (If you need more space, record your data on another sheet and tape it into your Science Notebook.)

Explanation:

| Statement | True or False? | How do you know? |
|--|----------------|------------------|
| Astrology and astronomy are basically the same thing. | | |
| Rovers communicate with Earth using radio waves. | | |
| Since we already went to the Moon, it is easy to send people to Mars. | | |
| Because Mars has a thinner atmosphere than Earth, the shape of a space probe is critical for landing on Mars. | | |
| Although spacecraft are constructed for specific missions and purposes, they are all designed and built in the same way. | | |

Evaluation:

What attributes will my Mars Rover need to:

Get to Mars _____

Carry out its mission _____

Send the data back to Earth? _____
