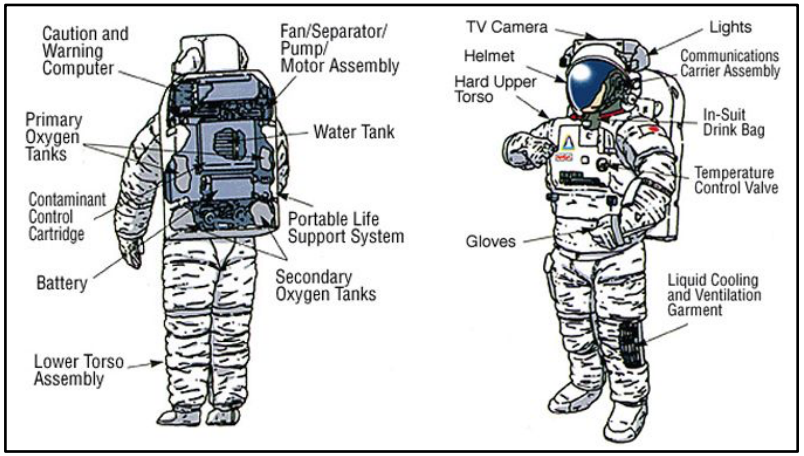
What Is Gravity?

Engage

The packs and spacesuits the astronauts in the Apollo program that went to the moon weighed about 100 pounds here on Earth. Below you see a picture on an astronaut wearing all the gear.



100 pounds is the size of a 7th or 8th grade student.

1. How would you like to carry around another person on your back?

2. Would you be able to skip down the sidewalk with another person on your back?

Watch the video, "Astronaut Gene Cernan runs and jumps on the Moon" with this 100 pound suit on at https://www.youtube.com/watch?v=NHeOpJh5Q-M

3. Why do you think he was able to run and jump so high?

Explore

Materials: 2 pieces of paper the same size and mass, 2 balls one with larger mass (marble and BB or tennis ball and Styrofoam ball), 2 aluminum pie tins, ruler or meter stick, triple beam balance, phone or other way to record the activity.

What To Do:

Part 1

1. Find the mass of all the objects you will be using in this activity.
2. Place that information in the data table below.

Object	Mass in grams
Paper 1	
Paper 2	
Ball 1	
Ball 2	

3. Crumple one of the pieces of paper.
4. Predict what will happen when both pieces of paper are dropped at the same time.

_____

5. Choose one student to hold one of the papers in each hand, making sure the flat paper is held parallel to the floor.
6. Set up the phone to record when the paper is dropped and when it lands.
7. Drop the papers 3 times and record the data below.
8. Use the recording to verify your answers.

Trial	Which paper reached the floor first ?
1	
2	
3	

9. Was your prediction correct? _____
10. What do you think made the difference?_____

_____

Part 2

1. Place the balls on the edge of the table.
2. Place the aluminum pie tins below the balls on the floor.
3. Predict which ball with hit the pie tins first.

_____

4. Set up the phone to record when the balls are dropped and when they land.
5. Use the ruler to push the balls off the table at the same time.
6. Repeat 3 times and record your data below.
7. Use the recording to verify your answers.

Trial	Which ball reached he floor first ?	How many sound did you hear when the balls hit?
1		
2		
3		

Questions:

1. Which ball reached the floor first? _____
2. Why do you think this happened? _____
3. Was your prediction correct? _____
4. Do you think the mass played any role in which ball hit the pie tins first? _____
5. What did the sounds tell you about which ball hit the pie tin first?_____

WHAT IS GRAVITY?

Explain

AIR RESISTANCE

GRAVITY

MASS VS WEIGHT

Elaborate

Materials: calculator

What To Do:

1. Use the chart below to determine the weight of a person who weighs 85 pounds on each planet in our solar system.

Planet	Gravity at Surface		Weight on Earth	Weight on Planet	Mass on Planet
Mercury	**.38g**	**X**	**85**		**38.5 kg**
Venus	**.91g**	**X**	**85**		**38.5 kg**
Earth	**1.0g**	**X**	**85**		**38.5 kg**
Mars	**.39g**	**X**	**85**		**38.5 kg**
Jupiter	**2.53g**	**X**	**85**		**38.5 kg**
Saturn	**1.07g**	**X**	**85**		**38.5 kg**
Uranus	**.91g**	**X**	**85**		**38.5 kg**
Neptune	**1.16g**	**X**	**85**		**38.5 kg**

Questions:

1. On which planet would you weigh the most? _____

2. Why do you think this is true? _____

3. On which planet(s) would you weigh the least? _____

4. Why do you think this is true? _____

5. The weights on Mercury and Mars are very close. What does this tell you about the size of these planets? _____

_____

6. The weights on Mercury and Jupiter are very far apart. What does this tell you about the size of these planets? _____

_____

7. Why is the person's mass the same on every planet?

_____

Evaluate

Name _____ period _____

EXIT TICKET

What Is Gravity?

1. Gravity is considered a _____.

A. Myth
B. Theory
C. Force
D. Problem

2. Mass is -

A. The force of gravity on an object
B. The amount of matter in an object
C. The force of friction from air molecules
D. The same as mass

3. Weight is –

A. The force of gravity on an object
B. The amount of matter in an object
C. The force of friction from air molecules
D. The same as mass

4. The reason a flat piece of paper falls slower than a crumpled piece of paper is –

A. Gravity
B. Air Resistance
C. It's mass is different
D. It's weight is different

5. Gravity is -

A. The reason clouds are in the sky.
B. The amount of matter in an object
C. The force of friction from air molecules
D. The force of attraction between two objects