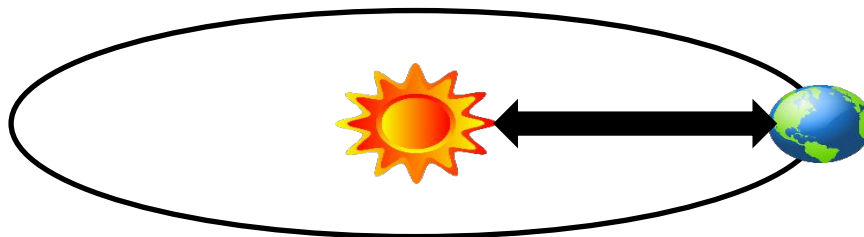


An astronaut in a white space suit is floating in space, holding a small white object. The Earth is visible in the background, showing a blue horizon and a bright sun or star in the upper left. The overall scene is set against a dark, starry background.

# Gravity and the Solar System

# Gravity

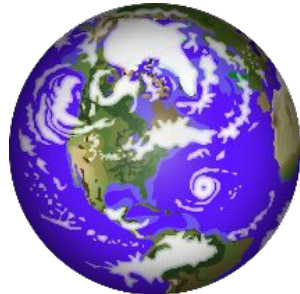
- The force that pulls all objects with mass toward one another
- Governs the motion of the solar system
- The greater the mass of an object, the greater amount of gravitational force
- The Sun has more gravitational force than any of the planets in the solar system – this explains why the planets revolve around the Sun



Gravitational Attraction Between the Sun and Earth

# Mass vs. Weight

- **Mass is the amount of matter in an object**
- **Mass does not change from location to location - a person's mass will be the same on Earth and on the moon**
- **Weight is a measure of gravity exerted on an object**
- **Weight can change depending on location - a person's weight will be more on Earth than on the moon because Earth has more gravitational force**



Earth



Moon

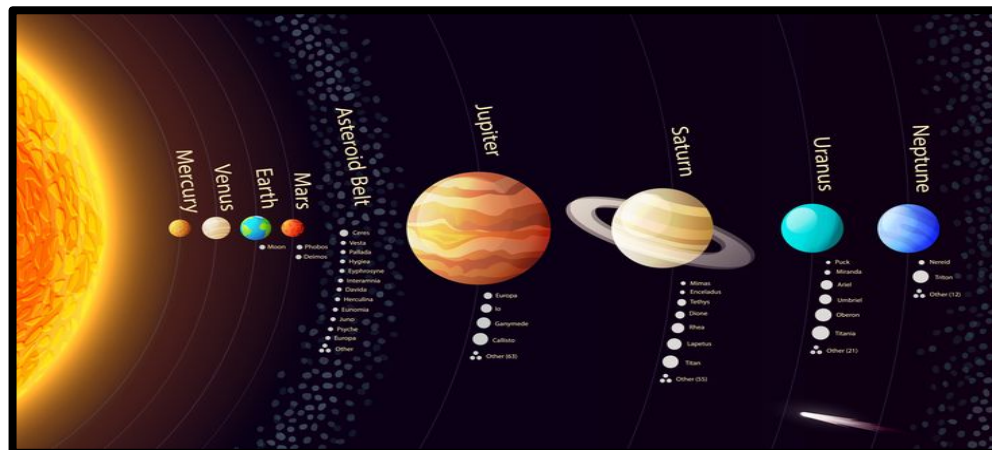
# Solar System Weights

The table below shows how the weight of a 150 pound object on Earth changes at different locations in the solar system.

Location	Weight (pounds)
Sun	4060.8
Mercury	56.7
Venus	136
Mars	56.5
Jupiter	354.6
Saturn	159.6
Uranus	133.3
Neptune	168.7
Pluto	10

# Solar System

- Consists of the Sun and everything that orbits it
- Contains inner and outer planets
- Inner Planets - Mercury, Venus, Earth, Mars
- Outer Planets - Jupiter, Saturn, Uranus, Neptune
- Asteroid Belt - located between Mars and Jupiter



# Inner Planets

- Rocky or solid surfaces
- Smaller in size than the outer planets
- Referred to as “terrestrial planets”

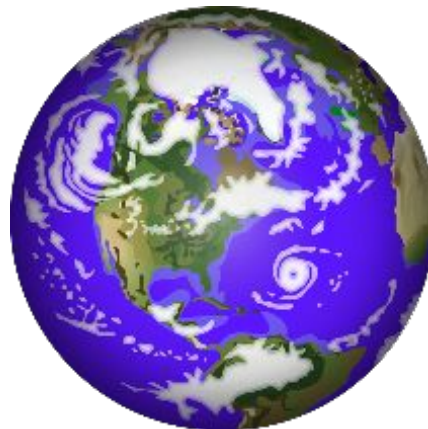
Mercury



Venus



Earth



Mars



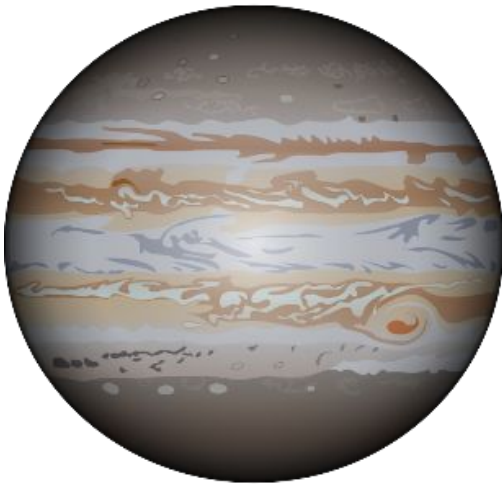
# Inner Planet Facts

- Mercury – closest planet to the Sun; smaller than Earth's moon
- Venus – referred to as “Earth's twin”; similar in size to Earth
- Earth – has an atmosphere with water; 70% covered by water
- Mars – referred to as the “Red planet”; violent dust storms

# Outer Planets

- Do not have rocky or solid surfaces
- Larger in size than the inner planets
- Referred to as “gas giants”

Jupiter



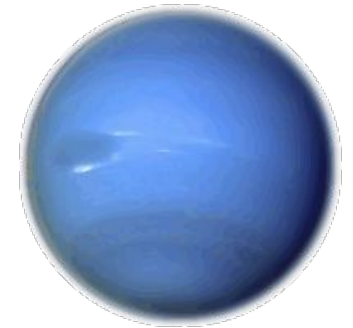
Saturn



Uranus



Neptune





# Outer Planet Facts

- Jupiter – most massive planet; shortest day of any planet
- Saturn – surrounded by rings; least dense planet
- Uranus – rotates on its side; first planet discovered by telescope
- Neptune – nearly 4 times the size of Earth; most violent weather

# Checkpoint

- **5 checkpoint questions**
- **Discuss each question with a partner**
- **Write a complete answer to each question on your notes page**



# Question 1

**Briefly explain  
the differences  
between mass  
and weight.**

# Question 2

**Identify 2 similarities and 2 differences of the inner and outer planets.**

# Question 3

**On which planet would you weigh the most? The least? Explain.**

# Question 4

**What object in the solar system has the greatest amount of gravity? What would happen if its gravitational pull was increased or reduced?**

# Question 5

**What forces keep  
the planets in  
orbit around the  
Sun?**