

SCIENCE
Fusion Physical Science
HOLT McDougal

PowerNotes

Unit 1 Lesson 4 Gravity and Motion

Down to Earth

What is gravity?

- **Gravity** is a noncontact force of attraction between objects due to their mass.
- All objects on Earth fall at the same rate once air resistance and other factors are removed.
- Force = mass \times acceleration due to gravity ($F = mg$), where g is about 9.8 m/s^2 .



What is gravity?

- All matter has mass, so all matter is affected by gravity.
- All objects experience gravitational attraction to all other objects.
- Earth and other planets are round because of gravity.



What is gravity?

- Some objects in space are not round because they are too small for gravity to shape them into a sphere.
- The paths of the planets, the sun, and our galaxy are determined by gravity.



A Weighty Issue

What determines the force of gravity?

- The law of universal gravitation states that all objects attract each other through gravitational force.
- The strength of the gravitational force is related to the mass of the objects and the distance between them.



What determines the force of gravity?

- Gravitational force between two objects increases as the distance between their centers decreases.
- Gravitational force between two objects increases as their masses increase.
- Objects with greater mass have more attraction between them than objects with smaller mass have between them.



Don't Bring Me Down

How does gravity keep objects in orbit?

- **Free fall** is when gravity is pulling an object down and no other forces are acting on it.
- An object is in **orbit** when it travels around another object in space.
- Forward motion and free-fall motion combine to cause orbiting.



How does gravity keep objects in orbit?

- Spacecraft, satellites, the moon, planets, and stars all complete orbits.
- Any object in curved motion is constantly changing direction.
- Gravity pulls objects toward the center of an orbital path.



How does gravity keep objects in orbit?

- Describe how forces keep the moon in orbit around Earth.

