

What is gravity?

- Gravity is a **force** of attraction between all objects that have **mass** (how much “stuff” an object has)
- Gravity pulls objects **toward** each other.
- All objects on Earth fall at approximately **9.8 m/s²** (round up to **10 m/s²** for district and state assessments) (**acceleration due to gravity**).

What does gravity do?

- Gravity is **invisible** but we can see its effects:
- Gravity between objects and Earth causes them to fall **downwards**.
- Gravity between the moon and Earth keeps the moon **orbiting** around Earth.
- Gravity between water on Earth and the moon causes **tides**.
- Gravity between the Earth and the **Sun** keeps Earth orbiting around the Sun.

What affects gravity?

The **MASS** of each object: the **more** mass an object has, the **greater** the force of gravity.

The **DISTANCE** between the objects: the **greater** the distance between the objects, the **lower** the force of gravity between them.

What is mass?

- **Mass** is the amount of matter (stuff) in an object.
- The mass of an object **does not change** when the object’s location changes.
- If the gravity is increased or decreased, the mass does not change.
- Mass is measured in milligrams (mg), grams (g), and **kilograms** (kg).
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What is weight?

- **Weight** is a measurement of the **force** of gravity pulling on an object.

- The **stronger** the pull of gravity on an object, the **heavier** it will be.
- Objects with **more mass** have **more weight** than objects with less mass.
- Weight **can change** depending on an object's location.
- Weight is measured in **Newtons** (N). **$1\text{ N} = 1\text{ kg} \times \text{m/s}^2$**
- Weight = mass x acceleration due to gravity (**$W = mg$**)