Name: **Date:**

Directions: Read the passage on pages 1 and 2. Then, answer the questions that follow.

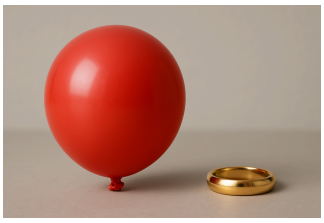
Why Don't We Float Away? Gravity, Mass, and Weight Explained

You can't see it, but **gravity** is always pulling on you. Whether you drop a pencil, jump into the air, or fall off a swing, gravity is the invisible **force** that brings you back down. Gravity works without any physical contact—it's a **noncontact force**, which means it can act across space and still cause objects to move. Gravity pulls objects toward each other, and it is responsible for keeping your feet on the ground and for making objects fall when dropped.

Gravity doesn't just happen between you and Earth. In fact, every object in the universe pulls on every other object with gravity, no matter how small or far apart they are. This powerful idea is known as **Newton's Law of Universal Gravitation**. It tells us that gravity acts between all objects that have **mass**—which includes everything made of **matter**, from stars and planets to you and your backpack.

The strength of gravity between two objects depends on two main things:

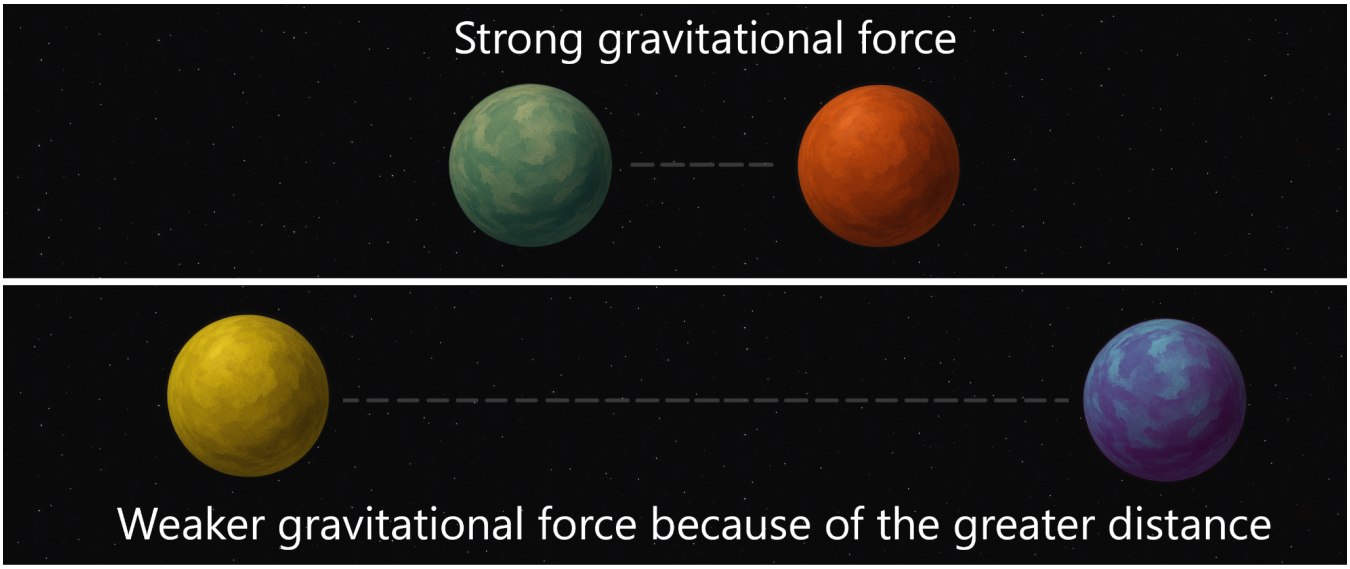
- **Mass** – This is the amount of **matter** in an object. Mass does not change based on location. The more mass an object has, the stronger its gravitational pull. For example, Earth has a much larger mass than a basketball, so Earth's gravity is much stronger and can pull objects toward its center with greater force.



Important! Just because something looks bigger doesn't mean it has more mass. For example, a large balloon takes up more space than a gold ring, but the gold ring has much more mass because gold is a much denser material. Mass depends on what something is made of, not just its size.

- **Distance** – The farther apart two objects are, the weaker the gravitational force between them becomes. This is why astronauts on the Moon feel less gravity than they do on Earth—they're farther away from Earth's center, and the Moon itself has less mass.

These two factors—**mass** and **distance**—determine how strong the **gravitational attraction** is. Even though gravity is weaker between small or distant objects, it's always there.



Gravity also explains why things have **weight**. Weight is the **force of gravity** acting on an object's mass. Unlike mass, **weight** can change depending on where you are in the universe. For example, your mass stays the same whether you're on Earth or the Moon, but you'd weigh less on the Moon because its gravity is weaker. So, while **mass** measures how much matter is in something, **weight** measures how strongly gravity pulls on that matter.

Without gravity, we wouldn't have falling objects, orbiting moons or planets, tides in the oceans, or even a sense of up and down. Gravity holds everything together—from the ground beneath your feet to the stars in the sky—and it is one of the most important **forces** in the universe.

Multiple Choice Questions

Circle the correct answer.

1. What is the relationship between mass and weight?
A) They are the same and do not change
B) Mass changes depending on gravity, but weight stays the same
C) Mass stays the same, but weight changes depending on gravity
D) Both mass and weight change on different planets

2. Which two factors determine how strong gravity is between two objects?
A) Shape and material
B) Temperature and volume
C) Speed and direction
D) Mass and distance

3. Which object would have the strongest gravitational pull?
A) A basketball
B) A silver ring
C) A balloon
D) The Earth

4. Why does the Moon have weaker gravity than Earth?
A) It spins more slowly
B) It has less mass than Earth
C) It is made of different materials
D) It is closer to the Sun

5. What does Newton's Law of Universal Gravitation tell us?
A) All objects with mass pull on each other with gravity
B) Gravity only works on Earth
C) Gravity is caused by air pressure
D) Gravity stops working in space

Open-Ended Questions - Answer in complete sentences

6. Explain how gravity can affect objects even when they are not touching. Give a real-world example.

7. Why might a gold ring have more mass than a large balloon, even though it looks smaller?

8. Imagine a world without gravity. How would your daily life change? Describe at least two major effects.

9. Why is it important to understand the difference between mass and weight when traveling to other planets or moons?

10. How does gravity help hold the universe together? Use evidence from the text to support your answer.

Matching Exercise

Draw a line to connect the term to the correct definition.

Term	Definition
11. Gravity	The amount of matter in an object
12. Mass	A force that acts across space without touching
13. Weight	The force of gravity acting on an object's mass
14. Distance	One of two factors that weakens gravitational pull
15. Noncontact Force	The force that pulls objects toward each other

GRAVITY WORKSHEET — ANSWER KEY

Multiple Choice Answers

1. **C** – Mass stays the same, but weight changes depending on gravity
2. **D** – Mass and distance
3. **D** – The Earth
4. **B** – It has less mass than Earth
5. **A** – All objects with mass pull on each other with gravity

Open-Ended Question Sample Answers

6. **Explain how gravity can affect objects even when they are not touching. Give a real-world example.**
   Gravity is a noncontact force, which means it can act over a distance. For example, Earth's gravity pulls on the Moon, keeping it in orbit, even though they aren't touching.

7. **Why might a gold ring have more mass than a large balloon, even though it looks smaller?**
   A gold ring has more mass because gold is a denser material than air or rubber. Even though the balloon is bigger, the gold ring contains more matter.

8. **Imagine a world without gravity. How would your daily life change? Describe at least two major effects.**
   Without gravity, objects wouldn't fall, so we would float around instead of walking. Water wouldn't stay in cups, and buildings or oceans wouldn't stay grounded—everything would drift.

9. **Why is it important to understand the difference between mass and weight when traveling to other planets or moons?**
   It's important because mass stays the same, but weight changes depending on the planet's gravity. This helps astronauts plan how much they can carry or how they move.

10. **How does gravity help hold the universe together? Use evidence from the text to support your answer.**
    Gravity keeps planets orbiting, causes tides, and gives us a sense of up and down. The passage says gravity pulls objects toward each other and holds everything together, from Earth to stars.

Matching Answers

Term	Definition
11. Gravity	The force that pulls objects toward each other
12. Mass	The amount of matter in an object
13. Weight	The force of gravity acting on an object's mass
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15. Noncontact Force	A force that acts across space without touching

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