

# Building Blocks of Science: Gravity

1. What is gravity?
2. What would happen if there was no gravity?  
The strength of gravity is dependent on two things. What are they?  
Complete the statements:
  - i) The further the distance between two objects the \_\_\_\_\_ the pull of gravity between them.
  - ii) The \_\_\_\_\_ the mass an object has, the more it pulls on objects around it.
3. Explain why your body is pulled toward the Earth?
4. How is gravity measured?
5. What do scientists use to measure gravity?
6. What has a stronger pull of gravity?
  - a) Elephant
  - b) Mouse
7. Why would you weigh less on the moon than you do on earth?
8. Why does a hammer fall faster than a feather when dropped?
9. What is friction?
10. What factors determine how fast or slow an object will fall through matter?
11. What happens to friction in space?
12. Explain the idea of inertia?
13. Compare what would happen to a soccer ball if you kicked it in space compared to kicking it on Earth?
14. Explain the differences between what happens to the soccer ball in space and on Earth.
15. How does the sun's gravity affect the planets?
16. What stops planets from crashing into the sun?
17. How does the moon's gravity affect Earth?
18. How do scientists believe gravity played a role in the formation of the sun and the planets?
19. How do black holes form?
20. Why are black holes considered the most violent and powerful objects in the universe?

## ANSWERS: BUILDING BLOCKS OF SCIENCE – GRAVITY (SECONDARY)

1. Gravity is the force that attracts all objects to one another.
2. Without gravity there is no force to keep anything on the ground. Everything would fly up into the air and into space.
3. Distance and mass.
4. i) The further the distance between two objects the weaker the pull of gravity between them.  
ii) The greater the mass an object has, the more it pulls on objects around it.
5. The Earth's mass is so much greater than your mass, so the Earth's gravity pulls you toward the ground.
6. Gravity is measured by the pull it has on an object i.e. weight. It is measured in pounds or kilograms.
7. When scientists weigh objects to measure their gravity, they use newtons as units of force.
8. a) Elephant
9. The moon has less mass than Earth, so its gravity is weaker. Therefore, you would weigh less on the moon.
10. Friction.
11. Friction makes two objects resist each other when one is pushed or pulled across the other. It causes moving objects to slow down or stop.
12. Size, shape and weight of an object determine how fast or slow an object falls through matter.
13. There is no air in space like there is on Earth, so there is no air to cause friction. Therefore, all objects fall at the same rate.
14. Inertia is the idea that for an object to move or be in motion, it needs to have a force act on it.
15. If you kicked a soccer ball in space it would continue in a straight line. If you kicked a soccer ball on Earth it would eventually fall to the ground.
16. In space there is no gravity or friction to stop the soccer ball. On Earth, the ball would fall to the ground because the Earth is full of forces that change the ball's motion.
17. The sun's gravity keeps the planets in the solar system from hurling off into space.
18. Inertia.
19. Changing tides are the result of the push and pull of gravity between the Earth and the moon.
20. Scientists believe that the entire solar system began as a spinning cloud of gas and dust in space. Gravity pulled the material together to form a ball of hot gas, the sun. Eventually other particles in the solar system cloud collided together to form the planets around the sun.
21. Black holes form when stars much larger than the sun use up all their fuel and the force of gravity causes the star to implode (collapse in on itself). Stars implode because the balance between the energy (light) exuded from the star and the force of gravity around it is no longer equal.
22. The gravity around a black hole is so powerful it will rip anything apart that comes near. Nothing can escape the gravity of a black hole, not even light.