Gravity in the Solar System

Gravity

No one knows what causes **gravity**, but it is described as a force that attracts two objects to each other. All objects gravitationally pull other objects.

For example, the earth gravitationally pulls on you, while you pull on the earth. This pull can also be seen when inanimate objects are gravitationally pulled towards earth and when planets orbit the sun.

Study Tip

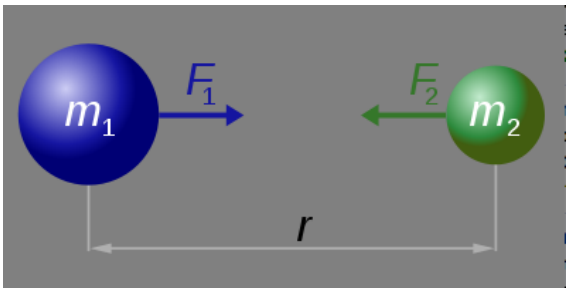
Every pair of objects is gravitationally attracted to each other. You are not able to attract very large objects, but sometimes you may find dust "orbiting" you.

Gravitational Force

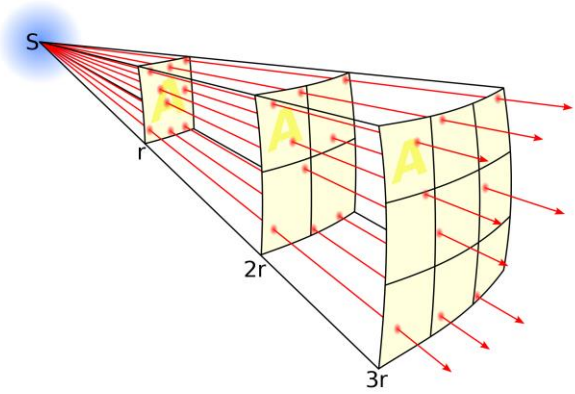
Gravity is affected both by the mass of the two objects being pulled towards each other and the distance between the two objects.

Gravity exemplifies the inverse square law, meaning that when the two objects are a distance x away from each other and you move the objects to a distance of 2x, the force of gravity at 2x will be one fourth of that it was when it was at x. This means that if you go far away from earth that the effects of gravity will be so weak that you won't feel anything.

Gravity allows the sun to keep the planets in orbit because even though the distance between the sun and the planets is great, the sun and planets have great masses, meaning that they still have strong gravitational attractions. This is the same reason why moons orbit planets.



This shows a pair of forces between two masses separated by a distance r.



This picture depicts the inverse square law. When you move 2r away, the force is spread out over a space that is 4x as big and therefore the force is ¼ as strong.

Concept Check

- Be able to define gravity, and explain/give examples of the two-way pull.
- Be able to state both of the factors that affect gravity.
- Be able to explain how the inverse square law works.
- Be able to explain how planets orbit the sun in our solar system even though they are very far away from each other.