



Gravity

Gravity is a force. It is different from most other forces because it can only pull things together but can't push them apart.

Gravity acts on mass. Gravity is what holds us on Earth and stops us from floating off into space. It also keeps Earth in its orbit around the sun. So, it stops Earth from floating off into space, too. Earth's gravity also keeps the moon in orbit around the planet. Without gravity, things would be floating around everywhere in space.

Newton was the first person to realize that the force making the moon orbit Earth is the same force that makes things fall to Earth. But scientists are still trying to figure out why gravity can only pull things together and can't push them apart.



Fun Facts

- No matter its size, everything on Earth is pulled downwards at the same rate.
- We are so used to gravity that our bones get weaker without it. This happens to astronauts who spend a long time in space.



↑ Without the force of gravity you would simply float off the planet!

Falling

On Earth, things look like they are falling downwards. Actually, they are falling towards the center of Earth. If you could dig a hole through Earth, right out to the other side, and then jump down it, you would only go as far as the center of the planet. That is where gravity wants to take you.





More Mass Is Better for Gravity

Everything with mass produces a gravitational (grav-uh-TAY-shuh-nuhl) field. Even everyday objects have gravitational fields. But the force in most of these fields is so small that it doesn't have any effect we can see. It is so small that it doesn't make anything move.

The size of the attraction between objects depends on their masses. The greater their masses, the more they attract each other and the bigger the force that attracts them. For example, Earth's pull on the moon is very strong compared to the pull of two pool balls on a pool table. Earth's pull is much bigger than the pull between you and a friend.

The size of the force (how much things attract each other) also depends on the distance between the objects. The farther away objects are, the less they attract each other.

↓ Objects with small masses have small gravitational fields. Because of this, their gravitational attraction is also small.



Doin' an Ollie

Have you ever done an ollie on a skateboard? If you have, you were using physics! All skateboard stunts – even just riding a skateboard – need the use of force to make them happen. To do an ollie, force from three sources is used. The first is the rider's foot pushing down on the tail of the board. This pushes the front of the board up. The second is the ground's reaction when the tail hits the ground. This pushes the back end of the board up. The third force is the rider's foot moving up the board. This tips the board forward so it can land flat at the end of the trick. Without any of the three forces, the rider wouldn't get anywhere at all.