

Grade 5 Science
Week of February 8 – February 12

Gravity

Force of Gravity

Gravity is an invisible, non-contact force that draws things towards the center of an object, such as a planet or a star.

- **Gravity is a force of attraction between two objects**
- **Gravity always pulls, it never pushes.**

Earth has gravity, and gravity is the reason why we aren't floating around everywhere. **Gravity** is what **pulls us down towards the earth**. It kind of straps us on, so that we don't fly off the planet!

Did you know? The **farther** we move from the Earth, the **less** gravity there is! There can be very little gravity in space if we're away from planets because planets provide gravitational pull!

Since the moon is much smaller than Earth, the gravity is much smaller.



Jumping Man on the Moon: <https://youtu.be/icSMMLqBTFw>

Anything that has mass, has a gravitational pull. So a car, an apple, your shoe, a tree, and even you.. all have a gravitational pull. It's just A LOT less of a pull compared to the gravitational pull of the earth.

More Mass = More Gravity



Above, you'll see a picture that looks similar to my Great Dane, who's name is Maggie. Did you know that Maggie, who weighs 100lbs here on Earth, would only weigh 38lbs on Mars, and only 13lbs on the moon?

That's right! But why, you might ask? Well, because there's **less gravity on Mars and on the moon than there is on Earth!** Know how high you can jump here on earth? Well, if you were on Mars you'd be able to jump almost **3 times higher on Mars!**

But why is there less gravity on Mars than there is here on Earth? Well, **force depends on the sizes of the masses involved.** So, since Earth is **bigger** (has more mass) than Mars and the moon, it has **more gravitational force.**



The bigger the mass, the bigger the attraction.

Did you know that if we didn't have gravity on earth, all of the water from our lakes, rivers, and oceans would float away? There would be nothing holding the water down! Check out Canadian Astronaut Chris Hadfield's videos to see what daily life is like in outer space.



How Astronauts Wash Their Hands: <https://youtu.be/JUUvInnVMSQ>

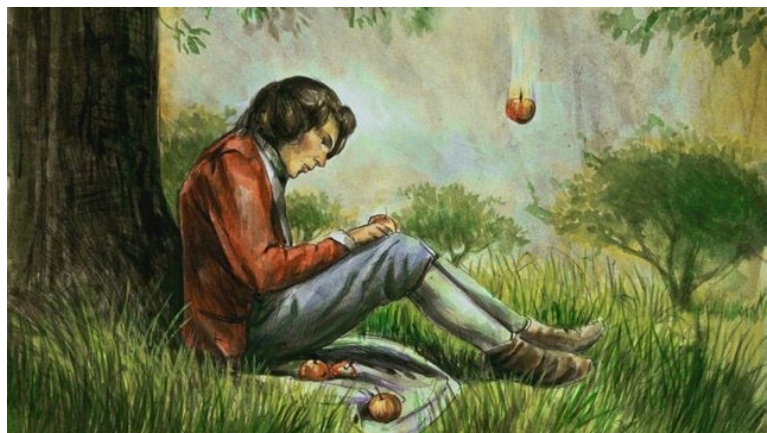


Nail Clipping in Space: <https://youtu.be/xlCkLB3vAeU>

Isaac Newton

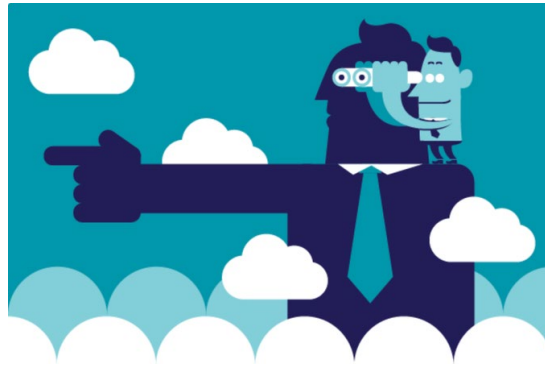
So, if gravity is an invisible force, how do we know about it?

Well, believe it or not, we didn't always know that gravity existed! The story goes that Isaac Newton was sitting under an apple tree when he saw one fall and wondered why it fell down towards the ground. He realized that if it was being pulled towards the earth, some invisible force *must* be pulling it. This was the start of Newton's exploration into the laws of motion.



In 1687, Sir Isaac Newton published his book *Philosophiæ Naturalis Principia Mathematica* which is still seen as one of the most important books in the history of math and science. Can you imagine discovering something that still influences the world hundreds of years later? Amazing!

One of the admirable qualities of Newton was that he was a humble man. He realized that had it not been for contributions of those before him, such as Aristotle, he would not have been able to make his discoveries and create his widely celebrated theories. He once said, "**If I have seen further it is only by standing on the shoulders of Giants**".



Watch these quick videos on Sir Isaac Newton and the 3 Laws of Motion:



Who Was Isaac Newton?: <https://youtu.be/m2JhWkQzw9A>

The next video will introduce you to Newton's 3 Laws of Motion. Don't worry too much about understanding them yet, the next few books will teach you more about these 3 laws.



Newton's Laws of Motion: <https://youtu.be/MDoO19J6Jic>

1. Gravity is:

2. True or False: There is **no gravity** on the moon or in space.

- a. True
- b. False

3. Fill in the blank: More _____ = More _____

4. Why is there less gravity on Mars than there is on Earth?

5. Who discovered gravity and how did he discover it?

6. Watch the following video to answer the following questions. **Video:** Who was Isaac Newton?

a. **Fill in the blank:** Isaac Newton was a _____.

b. **Who said that Isaac Newton was the smartest person who ever lived?**

c. **True or False:** Isaac Newton **invented** gravity

a. True

b. False

d. Newton invented a new kind of math called:

a. Geometry

b. Calculus

c. Algebra