

Target – **Compare** gravity



I can describe what gravity is. I can explain the differences between mass and weight. I can measure gravity and predict what happens to weight on other planets



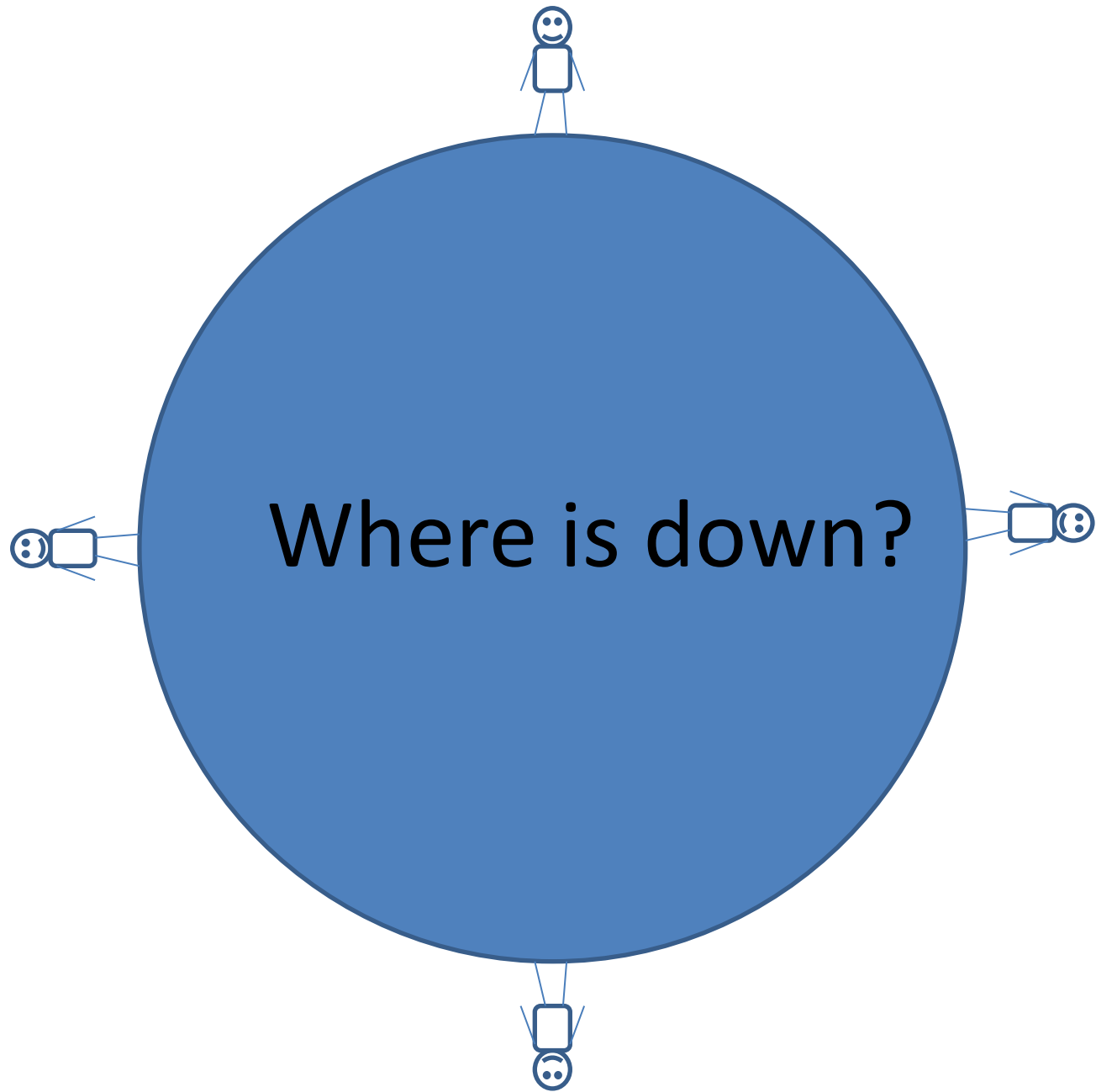
I can describe what gravity is. I can explain some differences between mass and weight. I can measure weight. I can describe differences in gravity on other planets



I can describe what gravity is. I can choose examples of mass and weight. I can measure weight.

Things always fall ...

Where is down?

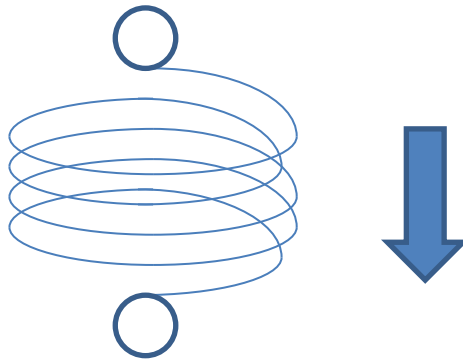


Where is down?

Gravity is -

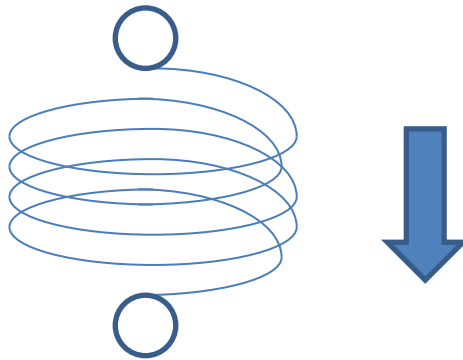
- **A force**
- An **invisible** force
- A force which makes objects **attract**
- A force which makes objects **pull towards the centre of the Earth**

Gravity can be measured by measuring the **force** with which objects are pulled towards the centre of the Earth

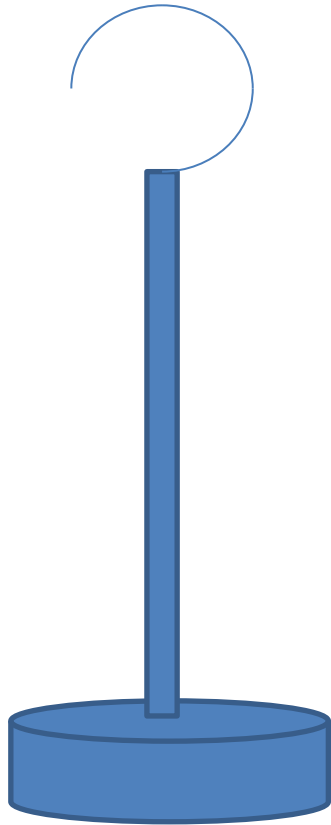


What happens when you hang a **mass** on a spring?

Gravity can be measured by measuring the **force** with which objects are pulled towards the centre of the Earth



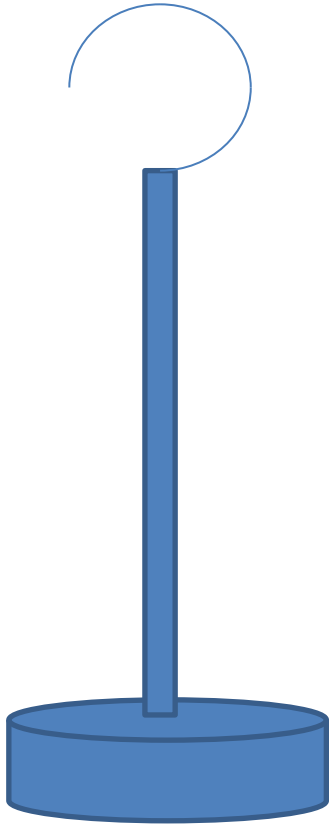
What happens when you hang a **bigger mass** on a spring?



A **mass** is an object which contains a certain quantity of material.

The more material it contains, the greater its mass.

Mass is measured in **grams**.



Weight is the force of gravity on a mass.

The *force* of gravity is always the same.

What happens to the weight when we make the mass bigger?

Weight and Mass

Mass (g)	Weight (N)
100	
200	
300	
400	
500	
600	
700	

The rule that links mass to weight is ...

Gravity is affected by the size of the planet.
The **bigger** the planet, the **bigger** the force of gravity.

The force of gravity on earth is roughly ***10 times*** –

1 kg mass -> 10 N weight

What would it be like on the **moon**?



Mass = 120kg
Weight = 120×10
= 1200N



Mass = 120kg
Weight = 200N

Gravity on other planets

Planet	Gravitation	Weight of 100kg
Earth	1	1000 N
Mercury		
Venus		
mars		
Jupiter		
Saturn		
Uranus		
Neptune		

Gravity

Gravity is an invisible _____ . It pulls objects _____.

Every object contains a certain quantity of matter. This is its _____, which is measured in _____ (_____).

The force of gravity acting on an object is its _____. This is measured in _____ (_____).

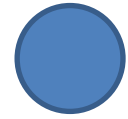
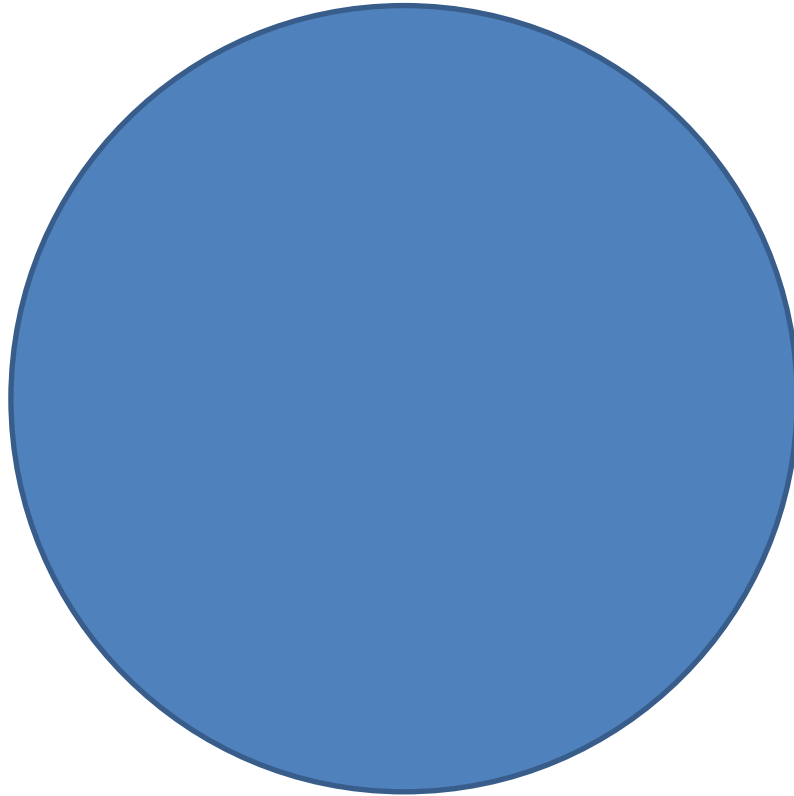
The bigger the mass, the _____ its weight will be.

Each planet has its own force of gravity. The _____ the planet, the bigger its force of gravity.

On the Moon, gravity is much _____ than on Earth, so objects appear much _____.

Gravity

Gravity is an invisible **force** . It pulls objects **together**. Every object contains a certain quantity of matter. This is its **mass**, which is measured in **kilograms (kg)**. The force of gravity acting on an object is its **weight**. This is measured in **Newtons (N)**. The bigger the mass, the **bigger** its weight will be. Each planet has its own force of gravity. The **bigger** the planet, the bigger its force of gravity. On the Moon, gravity is much **less** than on Earth, so objects appear much **lighter**.

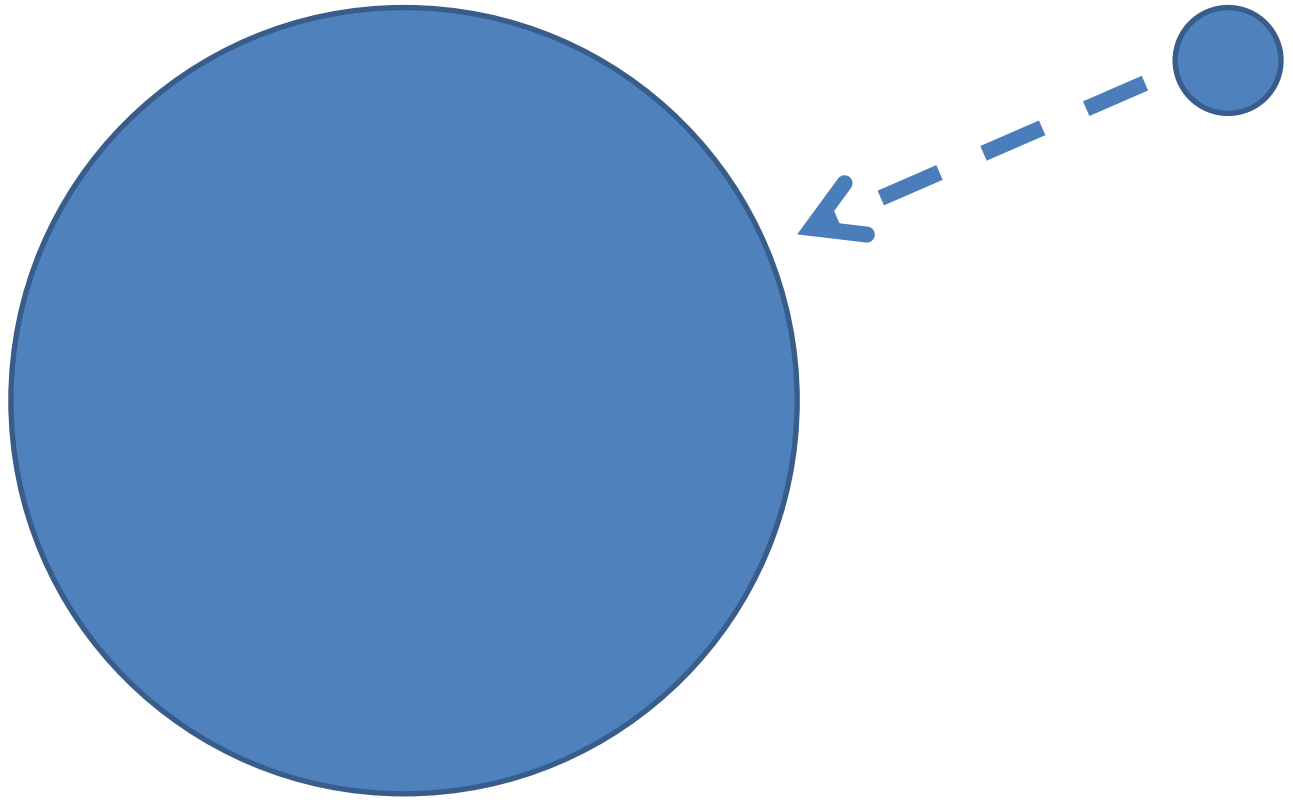


The moon orbits the Earth. The Earth is much bigger than the moon, so gravity should mean that the moon should be pulled towards the Earth and crash into it.

Why does this not happen?

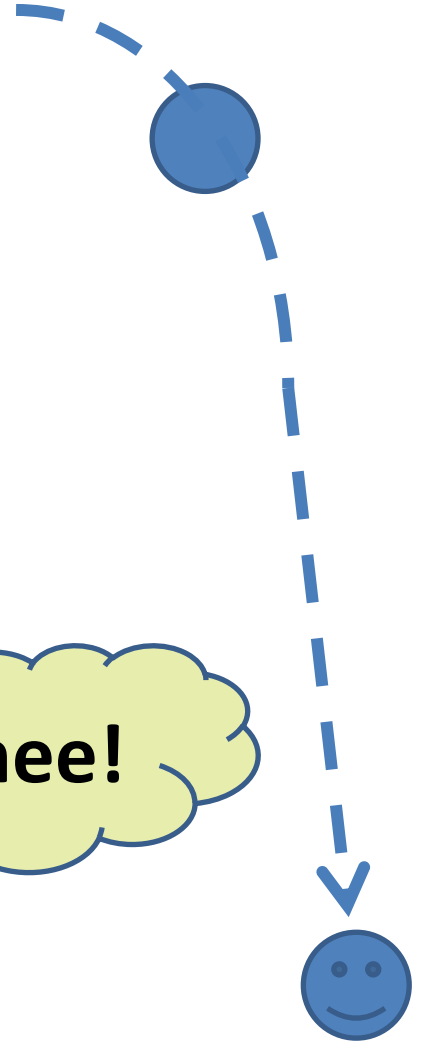
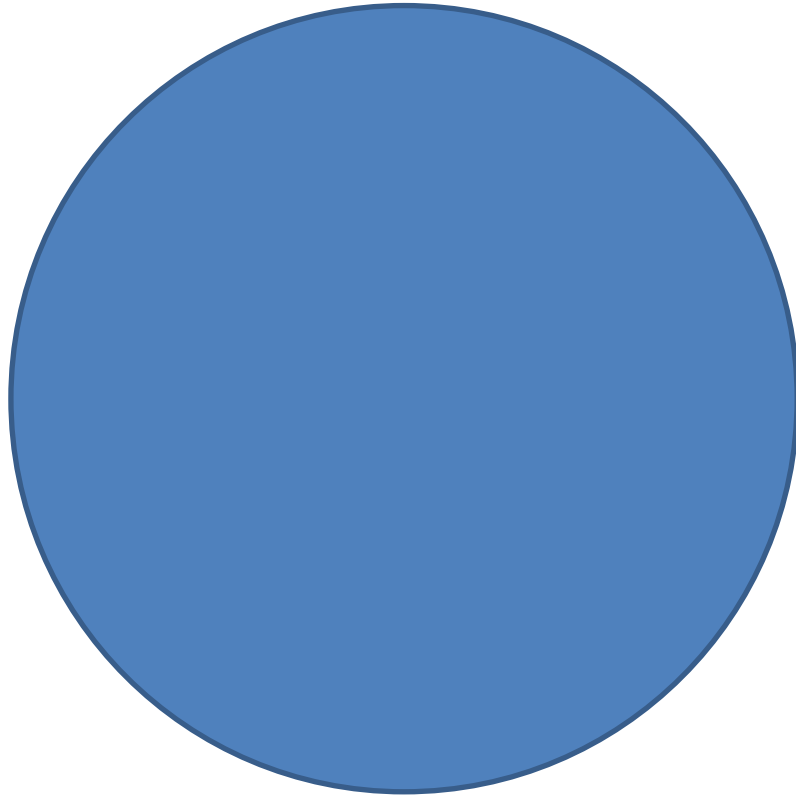
Congratulations!

You have just invented an **orbit**.

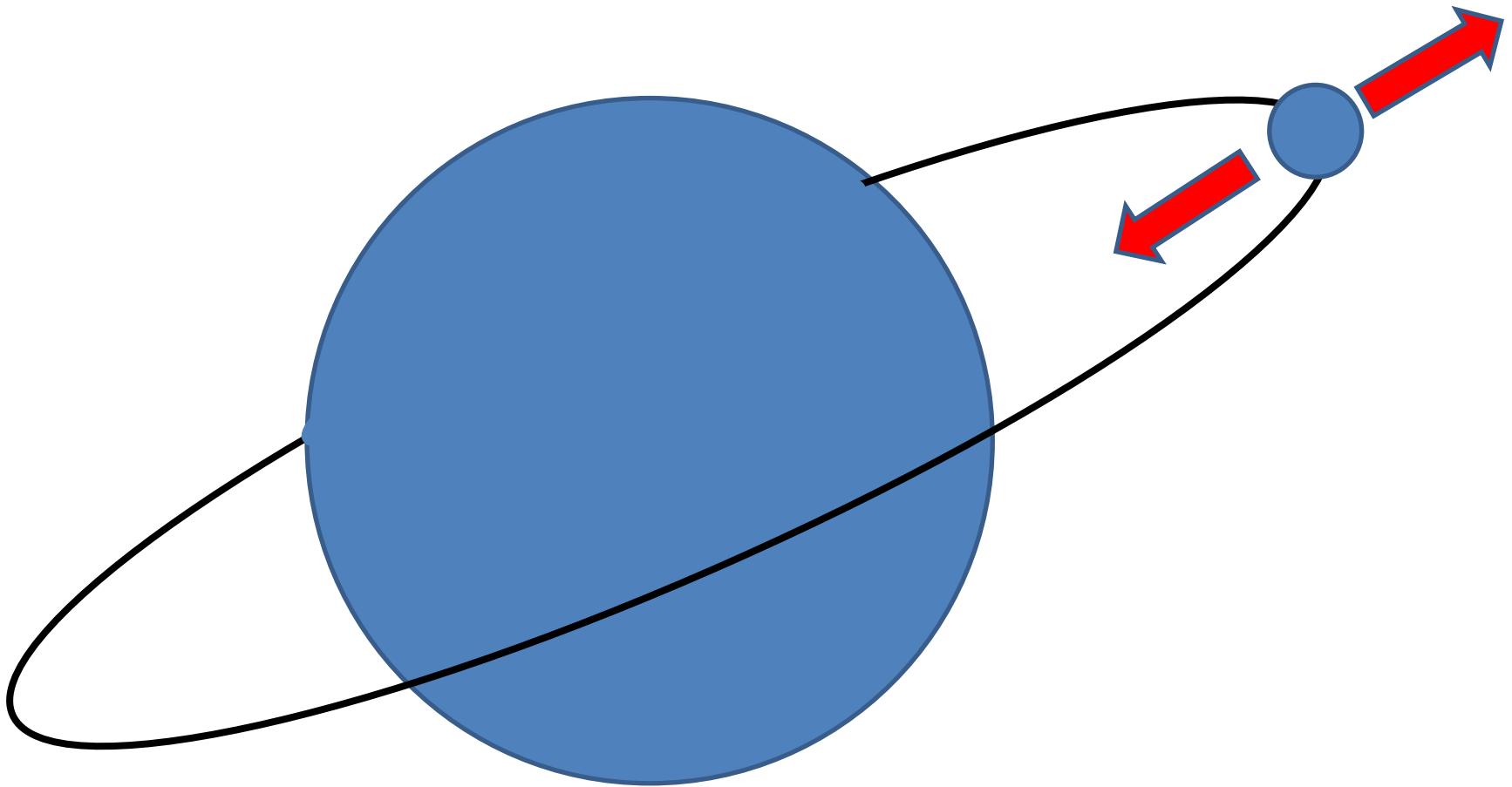


The earth has a gravitational pull on the moon. This makes them pull together.

But



The moon is moving at thousands of kilometers per hour. This should make it **shoot off into space!**



The moon is in orbit because the force of gravity pulling it towards the earth is exactly balanced by the force making it fly off into space – so it stays at **exactly the same distance from the earth**