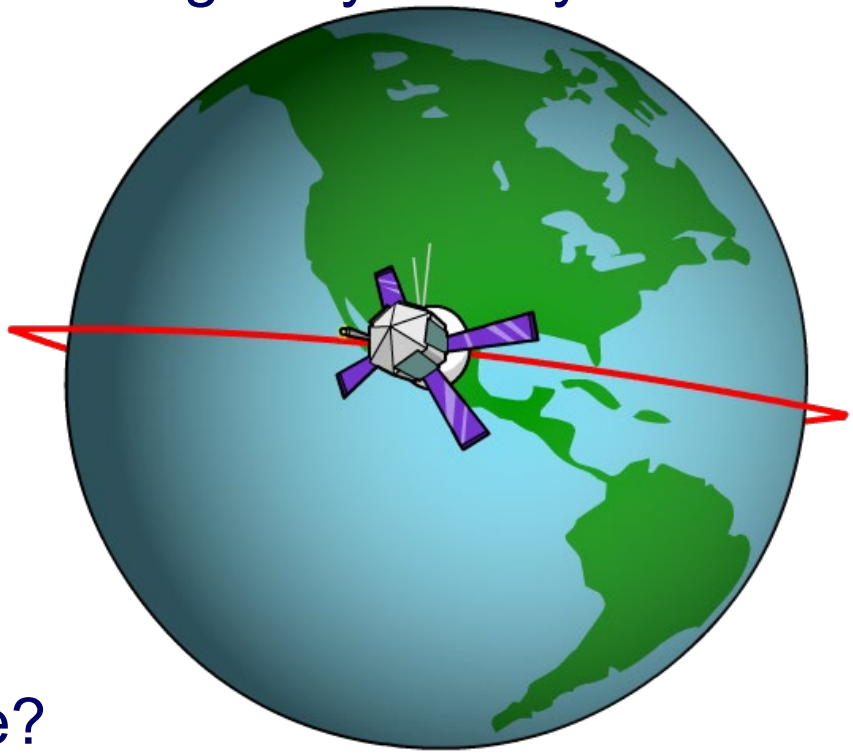
Satellites

Gravity and satellites

A **satellite** is any object that orbits another object.

The Moon is a **natural satellite** of the Earth and is kept in orbit by the attraction of the Earth's gravity and by its motion.

An **artificial satellite** is an object made by, and put into orbit by, humans.



Why do you think satellites stay in orbit, instead of falling back onto the surface of the Earth or drifting off into space?

Newton’s thought experiment

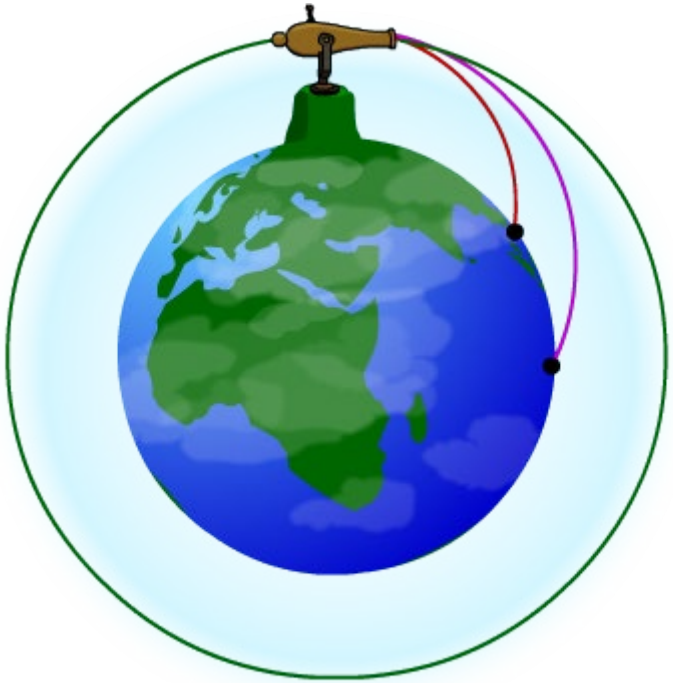
What is an orbit?

Sir Isaac Newton devised a thought experiment to explain how objects become trapped in orbit by the Earth's gravity.

Click "**play**" to find out more about this thought experiment.

Orbit height and speed

Imagine the mountain in Newton's thought experiment was lower.



If the same amount of gunpowder was used, would a ball shot from the lower mountain travel the same distance as from the high mountain?

No. More gunpowder would be needed to make the ball travel the same distance. Therefore, more gunpowder would be needed to make the ball go into orbit.

This means that if a satellite orbits the Earth at a **lower** altitude, it needs to travel **faster** to stay in orbit.

Satellite orbits

Geostationary and polar orbits

Artificial satellites can have different types of orbits.

What are the differences between **geostationary** and **polar** satellite orbits?

Click on the buttons to find out.

geostationary

polar

Which type of satellite?

Does each statement apply to geostationary or polar satellites?

geostationary	polar

speed of orbit is not the same as Earth's rotation

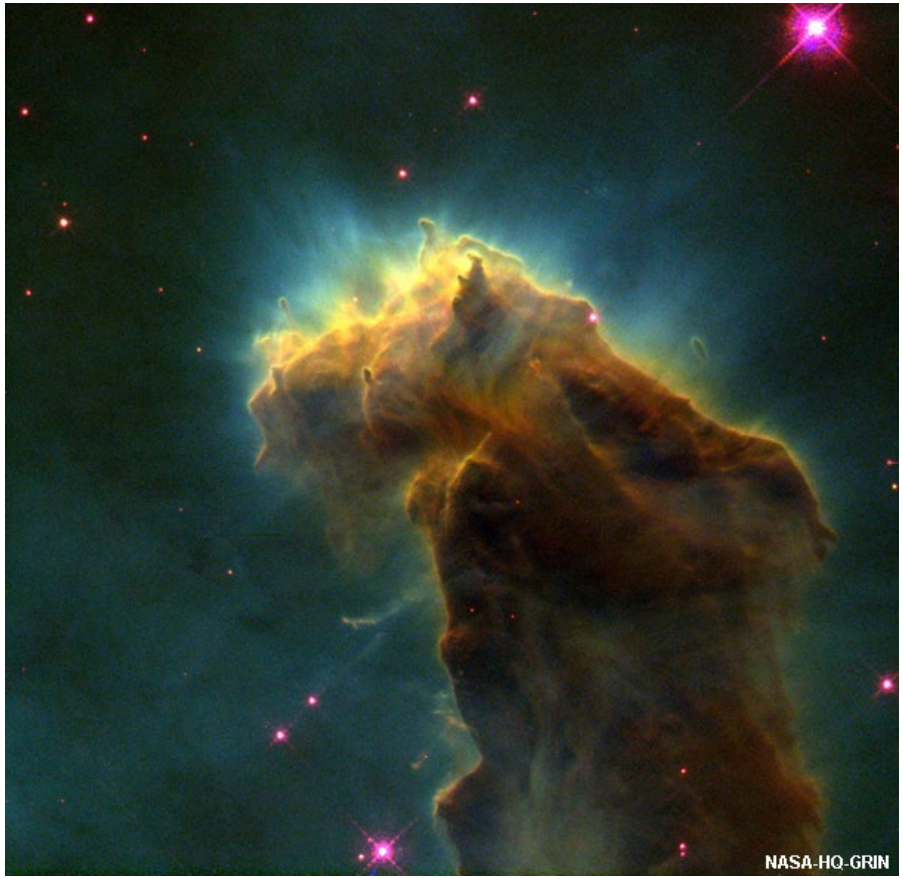
solve

What is the Hubble Space Telescope?

The Hubble Space Telescope (HST) is a satellite in orbit around the Earth. It was deployed from the Space Shuttle *Discovery* on April 24th, 1990.

The HST is outside the Earth's atmosphere and does not experience the same interference as Earth-based telescopes.

This means that its images of the Universe are much more detailed than images observed from Earth.



Questions about satellites

Are these statements about satellites true or false?

1.	Geostationary means that a satellite is above a fixed point on the Earth.	
2.	Two uses of geostationary satellites are for weather monitoring and spying.	
3.	The Hubble Space Telescope is in Florida.	
4.	The Hubble Space Telescope is in high orbit around the Earth.	
5.	Polar satellites can move over every point on the Earth over the course of about 12 orbits.	
6.	Satellites need to reach the same speed in order to stay in orbit, regardless of the height over the Earth.	

true false

?

solve