



Rocket Challenge

Newton's first law of motion

Video transcript

Hi! It's me again, Athul.

You've learned a lot about rockets so far on your Rocket Challenge journey, but you might still be wondering: how do I make my rocket fly? I'm glad you asked because I'm here to tell you.

The way a rocket flies depends a lot on physics. Specifically, a guy named Sir Isaac Newton, and his laws of motion.

Sir Isaac Newton was an English mathematician, physicist, astronomer, and theologian who is one of the most influential scientists of all time. He came up with 3 laws of motion.

Let's take a look at his first law of motion.

Title card: Law 1: Inertia

Newton's first law of motion is also called the law of inertia. What it says is:

An object at rest stays at rest and an object in motion stays in motion with the same speed and in the same direction unless acted upon by an unbalanced force.

That's a lot of words! But basically, this means that a stationary object will stay motionless, and a moving object will keep moving, unless something acts on the object to change that. This is called inertia.

Think about your bike. The wheels will keep moving unless you apply a force – like the brakes – to stop it.

Let's use an easy ball activity to apply Newton's first law.

An object – like this ball – already at rest will stay at rest unless interrupted by an external force. So, my foot kicking the ball would cause it to move.

An object already in motion will stay in motion unless interrupted by an external force. For example, if it wasn't for grass causing friction, when we kick our ball it will continue to roll and never stop – or as in this case my head is the external force stopping the ball!

So, how does this law apply to rockets?

Rockets need to escape the Earth's gravity – the force pulling objects towards the Earth. To do this, they must generate a huge amount of thrust. We need fuel to create this force that pushes the rocket upwards. Basically, a rocket with more mass will require more force to move – we call this law inertia.

You got it? Good. Thanks for watching. Good luck with building your rockets.