



Why Objects Need Force to Move and Stop

KS4 PHYSICS

FORCES

NEWTON'S LAWS

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What Is Inertia?

Imagine a ball sitting perfectly still on a table. It will stay there forever unless something pushes it. This idea is called **inertia**. **Inertia** is the tendency of objects to keep doing what they're already doing—staying still if they're still, or moving if they're moving. This is such an important idea in physics that it's called **Newton's First Law of Motion**, discovered by scientist **Sir Isaac Newton** in the 1600s.

An object at rest wants to stay at rest. An object in motion wants to stay in motion. Nothing changes unless a **force** acts on it.

Think of it like a skateboard sitting on the ground. It won't roll anywhere by itself. You have to push it (apply force) to make it move. Once it's rolling, it won't stop by itself either—it will keep going until friction or another force makes it slow down and stop.

How Force Changes Motion

A **force** is a push or a pull. When you apply a force to a stationary object, you overcome its inertia and get it moving. The bigger the force, the faster it accelerates. If you're pushing a toy car gently, it moves slowly. If you push it hard, it zooms off quickly.

The same thing works for stopping. Once something is moving, it wants to keep moving in a straight line. To stop it, you need to apply a force in the opposite direction. When you hit the brakes on a bike, you're applying force to slow down and eventually stop.

Think of it like a hockey puck sliding across ice. Once you hit it, it keeps sliding because there's almost no friction. But the moment it hits the wall (a force), it stops. Without that force from the wall, it would slide forever.

Why This Matters in Real Life

Understanding inertia and force explains why you lurch forward when a car suddenly stops, or why you need to keep pedalling to maintain speed on a bike. It's also why

seatbelts are so important—they apply force to stop your body when a car crashes. Without them, your body would keep moving forward because of inertia.

Newton's First Law teaches us that nothing in the universe moves or stops on its own. Everything needs a force to change what it's doing. That's one of the most fundamental rules of how the world works.