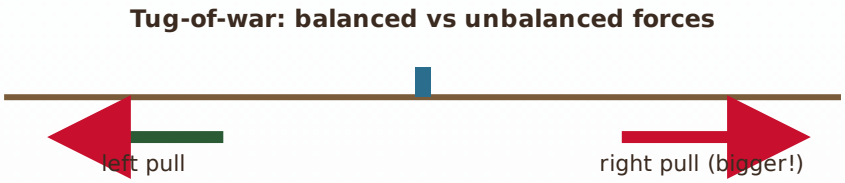
Forces All Around

Pushes, pulls and force arrows

A **force** is a push or a pull. Forces can make things start moving, stop, speed up, slow down or change direction. We show a force with an **arrow**: the way it points shows the direction, and a **bigger arrow means a bigger force**.



Top: a push and a pull, shown with arrows. Bottom: in a tug-of-war, equal pulls are balanced (the flag stays still); when one side pulls harder the forces are unbalanced and the flag moves that way.

> Some forces need **touch** — a push, a pull, or **friction**. These are **direct contact forces**. Other forces act **without touching** — magnetism and gravity. These are **force at a distances**.

Working with forces

Q1. Is each action a **push**, a **pull**, or **both**?

Action	Push, pull or both
Opening a drawer	
Kicking a ball	
Pressing a doorbell	
Pulling up your socks	
Riding a swing	

Q2. Sort these forces into **contact** (needs touching) or **at a distance** (no touching): *friction, gravity, a push, magnetism, a pull.*

Contact force	Force at a distance

Q3. Draw the force arrows on this tug-of-war so that the **left team wins**. Remember: a bigger arrow means a bigger force.

Q4. Two teams pull a rope with **equal** force. Are the forces balanced or unbalanced? What happens to the rope?

Q5. Explain what **unbalanced** forces do to an object. Give one example.