

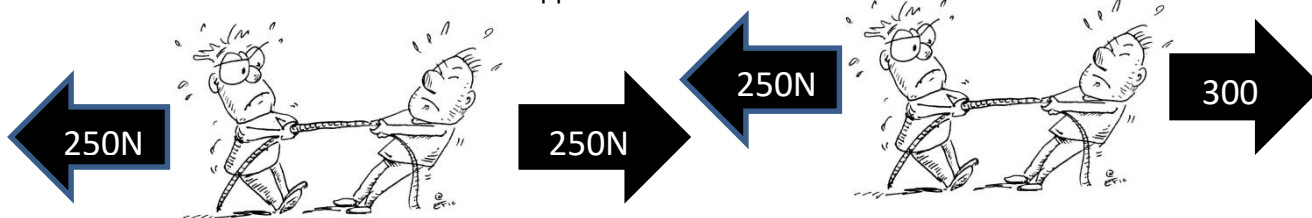
Year 7 Science knowledge organiser: P1 Forces

Overview of topic: This unit explores the concept of forces which are pushed and pulls. Forces are split into contact and non-contact forces which can be balanced or unbalanced. When the resultant force on an object is 0N, the object is in equilibrium and will move at a constant speed in a straight line. Force can be used to calculate the pressure that particles exert on a surface.

Key content/ ideas/ concepts

Keywords/ Glossary

A **resultant force** is the combined effect of opposite forces:



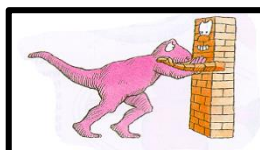
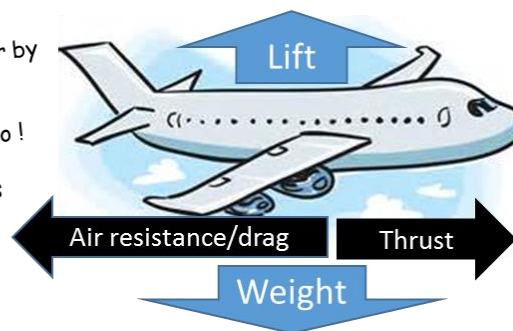
Resultant force = 0N

Resultant force = 50N right

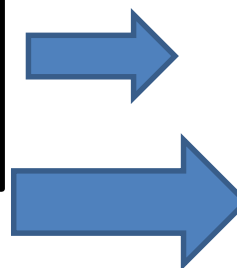


Measured using a Newtonmeter
The units of force are Newtons (N)
Named after Isaac Newton who
proposed 3 laws of motion

You can reduce air resistance/drag in air or water by making an object 'streamlined'
You can reduce friction by lubricating objects too!
Friction can be useful - shoes, tyres, brake pads



A **reaction force** is basically a **force** that acts in the opposite direction to an **action force**. (pushing against a wall is an action force and the wall pushing back at you is the reaction force)



Thicker or longer arrows show larger forces on force diagrams

Force: Forces are pushes or pulls that act on objects

Drag: The force acting on an object moving through the air or water that causes it to slow down.

Friction: The force that resists movement because of contact between surfaces.

Balanced forces: When opposing forces on an object are equal.

Unbalanced force: When opposing forces on an object are unequal.

Resultant forces: The overall result of the forces on an object – It is represented as a number/arrow

Newtons (N): The unit for forces.

Equilibrium: When forces are balanced.

Wider reading

Newton's discovery of forces. NASA and the recent discovery of an multi-exoplanet system. The 21st century space race by Space X, Blue Horizon and Virgin Galactic.

	Stationary object	Moving objects
Balanced forces or no force	Stays still	Moves at a constant speed
Unbalanced forces	Moves in the direction of the resultant force	Accelerates or decelerates

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Self-Quiz Questions	Self-Quiz Questions	Challenge Self-Quiz Quizzing
1. What 3 things do forces do?	1. What happens to an object if the forces are unbalanced?	1. Explain how friction helps you walk.
2. Name 2 non- contact forces.	2. What are the 3 variables in any experiment?	2. Draw a diagram showing the forces acting on an aeroplane.
3. Name 3 contact forces.	3. What is needed for a good graph?	3. Explain why rockets need to be streamlined.
4. What piece of equipment is used to measure force?	4. Write the definition of resultant force	4. Explain why a car speeds up when the driver pushes the accelerator pedal.
5. What unit is force measured in.	5. What would the resultant force be on an object if is not moving?	5. Explain in terms of forces why objects float.
6. Friction is a drag force, what are the other 2?	6. Describe the difference between a contact and a non-contact force.	6. Explain in terms of forces why objects sink.
7. Define the term friction.	7. Which scientist came up with the theory of gravity?	7. Why would parachute slow a sky-diver down?
8. How can friction be reduced?	8. How are the arrows drawn to show a larger force?	8. How many newtons are in 2.3kN?
9. What is the difference between a balanced and unbalanced force?	9. Draw a force diagram showing balanced forces	9. How many newtons are in 345kN?
10. What happens to an object if the forces are balanced?	10. Apart from the size of the force, what else do force arrows show?	10. Why do car engines need to be lubricated with oil?
Total score	Total score	Total score