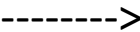


Fold in half at the line

Glue on this side



Contact Forces

1	I can identify the forces acting on an object and determine if it is contact or non-contact force.
2	I can draw and label free body diagrams.
3	I can describe air and water resistance and explain ways of reducing or increasing air and water resistance.
4	I can describe friction. I can explain ways of reducing or increasing friction and discuss some applications of friction.
5	I can calculate a resultant force.
6	I can predict the effect on an object's motion from the resultant force acting on it.

1	balanced (forces)	Forces acting on an object that are the same size but act in opposite directions.
2	contact force	Force that acts by direct contact, e.g., friction.
3	friction	Force opposing motion which is caused by the interaction of surfaces moving over one another. It is called 'drag' if one is a fluid.
4	Newton	Unit for measuring forces (N).
5	Newtonmeter	A piece of equipment used to measure weight in newtons.
6	resultant force	Single force that can replace all the forces acting on an object and have the same effect.
7	unbalanced (forces)	Opposing forces on an object that are unequal.
8	weight	The force of gravity due to the Earth (or other planet or moon) on an object (N).
9	friction	Force opposing motion which is caused by the interaction of surfaces moving over one another. It is called 'drag' if one is a fluid.

Prior Knowledge From KS2:
At KS2 you will have covered the different life process and explained and explored the basic structure of animals and plants. You will have looked at why organisms are classified as plants or animals based on specific characteristics

Why?
Cells are the building blocks of life. Every organism is made form them. Cell research is the future of many medical advances including drugs and cancer treatment

Future Learning:
At GCSE you learn in more detail about cell structure and function and look at the role of specialized cells in multicellular organisms. You will also look at stem cells and their uses in medicine and beyond. You will learn how cells divide to be used in growth, repair and replacement of old cells

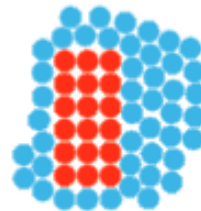
Careers:
Endocrinologist
Biologist
Science writer
Lab technician

Friction and drag

- Friction** is a force which will slow down a moving object due to two surfaces rubbing on one another
- The greater the friction, the faster an object will slow down, or the greater the force it will need to overcome the force of friction. For example, it is easier to push a block on ice than on concrete, as the ice is smoother and causes less friction
- When an object is moving through a fluid, either liquid or gas, the force which slows it down is known as **drag**
- The fluid particles will collide with the moving object and slow it down, meaning that more force is needed to overcome this
- Both drag and friction are **contact forces** as the two surfaces in friction, and the object and fluid particles in drag, come into contact with one another
- Both drag and friction are forces so they are measured in **Newton's (N)**



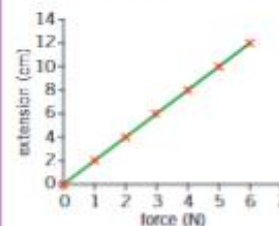
A solid moves through a gas.



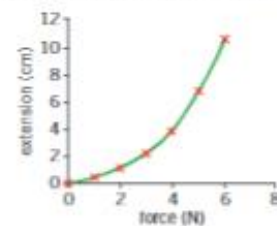
A solid moves through a liquid.

Hooke's law

- Some objects, like springs, can be stretched, the amount that they stretch is known as their **extension**
- A force needs to be applied to the spring for it to be stretched, we can achieve this by adding masses which exert the force weight
- A spring will continue to stretch until it passes its **elastic limit**
- If an object obeys **Hooke's law** it will have a **linear relationship**: if the force applied to the spring is doubled, the extension will double too
- If an object does not obey Hooke's law, it will not have a linear relationship



This graph shows how the extension of a spring changes as you pull it

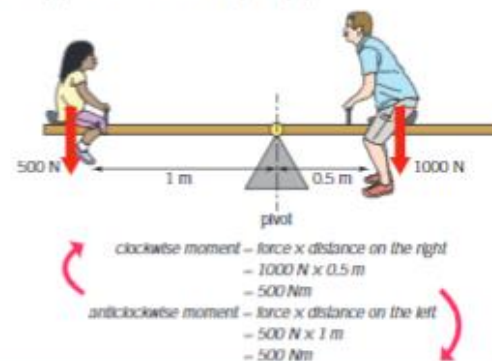


This graph shows the relationship between force and extension

Turning forces

- A **moment** is the turning effect of a force, it is measured in Newton meters
- We can calculate a moment with the equation:
$$\text{moment (Nm)} = \text{force (N)} \times \text{distance from the pivot (m)}$$

- The size of the moment will increase as the distance from the **pivot** or the size of the force increases
- When an object, such as a seesaw, is balanced, the clockwise and the anticlockwise moments will be equal and opposite, which is known as **equilibrium**
- When forces are equal and opposite to each other, there is no **resultant force**



Complete some of the tasks below to reach a total of _____ points over this unit of work – highlight the box once completed.

Topic	1 Point	2 Points	4 Points	6 Points	10 Points
Friction and drag 	Name one difference between a contact and non-contact force.	Make a flash card about each force you have learnt about so far.	Describe what would happen to an object that had friction.	Write a story that includes a description of at least 4 different forces.	Plan an investigation to find out how the type of shoe affects frictional force.
Squashing and Stretching 	List 3 things that forces can do to an object.	Draw a force diagram for 3 scenarios where different forces are involved. Label the forces.	Make a jigsaw for each of the equations you need to remember in this unit.	Design a leaflet to explain 4 different types of forces you have learnt about so far.	Produce an animation that shows the forces acting on a parachutist as they jump out of a plane.
Moments $P \perp V \perp D \perp T$ 	Write down the equation for moments.	Draw a diagram to explain moments.	Write a poem or rap to describe how moments work.	Write a quiz and the answers with at least five questions about forces.	Write a poem or song that will help you to remember the new keywords you have covered this unit.

