Key Stage 2 Science | **Title of Topic : Forces and Magnets** | **Term: Autumn 2**

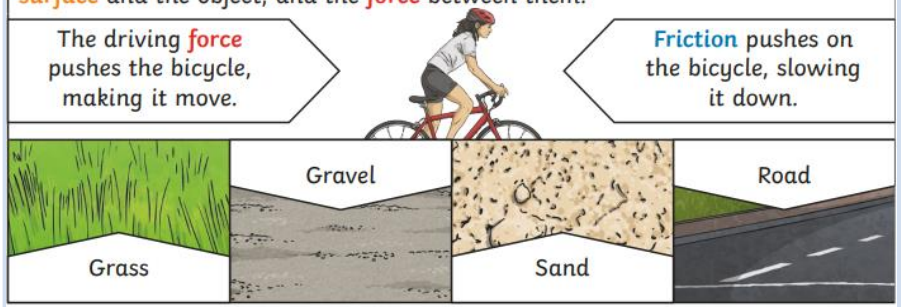
National Curriculum Science

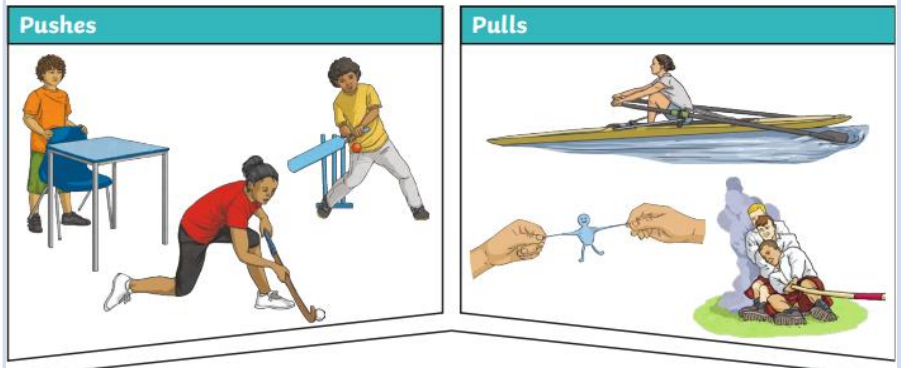
Pupils should be taught to:

- Compare how things move on different surfaces
- Notice that some forces need contact between two objects, but magnetic forces can act at a distance
- Observe how magnets attract or repel each other and attract some materials and not others
- Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials
- Describe magnets as having two poles
- Predict whether two magnets will attract or repel each other, depending on which poles are facing.

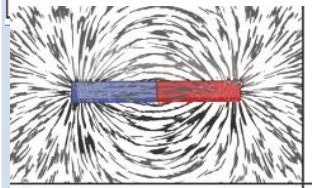
Key Learning

Different surfaces create different amounts of friction. The amount of friction created by an object moving over a surface depends on the roughness of the surface and the object, and the force between them.



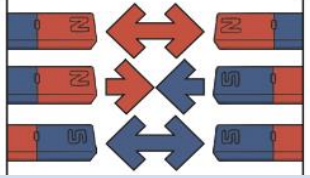


Forces will change the motion of an object.
They will either make it start to move, speed up, slow it down or even make it stop.



A magnetic field is invisible. You can see the magnetic field here though. This is what happens when iron filings are placed on top of a piece of paper with a magnet underneath.

Like poles repel.
Opposite poles attract.



The needle in a compass is a magnet. A compass always points north-south on Earth.

Vocabulary

magnet	An object which produces a magnetic force that pulls certain objects towards it.
magnetic	Objects which are attracted to a magnet are magnetic. Objects containing iron, nickel or cobalt metals are magnetic.
magnetic field	The area around a magnet where there is a magnetic force which will pull magnetic objects towards the magnet.
poles	North and south poles are found at different ends of a magnet.
repel	Repulsion is a force that pushes objects away. For example, when a north pole is placed near the north pole of another magnet, the two poles repel (push away from each other).
attract	Attraction is a force that pulls objects together. For example, when a north pole is placed near the south pole of another magnet, the two poles attract (pull together).

forces	Pushes or pulls.
friction	A force that acts between two surfaces or objects that are moving, or trying to move, across each other.
surface	The top layer of something.

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	Key Learning:
1	**What forces act on objects?** The individual forces that act upon an object are gravity, normal force, friction, air resistance, applied force, tension, spring force, electric force, and magnetic force.
2	**Why does surface affect speed?** Friction forces slow down moving objects. A rough surface will create a greater friction force against a moving object than a smooth surface.
3	**Which materials are magnetic?** If a magnet sticks to a material, then that material is **magnetic**. This material will also be a metal. There are three magnetic metals: iron, nickel and cobalt. Materials like plastic, cotton and stone are not magnetic because magnets don't stick to them.
4	**Is the biggest magnetic always strongest?** A magnet's strength is not only determined by its size, but also by the material of which the magnet is made and the number of “tiny magnets” lined up in the magnet. A larger magnet will have a stronger magnetic field than a smaller mag- net made of the same material.
5	**What are magnetic poles?** Magnets have two ends. We call these their north pole and south pole. When two of the same poles are placed close together they repel (push apart) each other. When two different poles are close, they attract (pull together) each other.
6	**Attract or repel?** One simple rule to remember with magnets is that opposites attract. Every magnet has a north pole and a south pole. Placing two unlike poles together causes them to attract. When you try to place two like poles together (north to north or south to south), they will repel each other.