**Forces and Magnets**

**NC Statutory Guidance**

Pupils should be taught to:

* compare how things move on different surfaces
* notice that some forces need contact between 2 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 2 poles
* predict whether 2 magnets will attract or repel each other, depending on which poles are facing

**Working Scientifically**

During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

* asking relevant questions and using different types of scientific enquiries to answer them
* setting up simple practical enquiries, comparative and fair tests
* making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
* gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
* recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
* reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
* using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
* identifying differences, similarities or changes related to simple scientific ideas and processes
* using straightforward scientific evidence to answer questions or to support their findings.

**Resources**

Twinkl PlanIt to be adapted.

**Lesson Overview (Statutory in Bold)**

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| WALT | Knowledge to be Taught | Skills to be Taught and Investigations | Vocabulary |
| Identify forces acting on objects. | A force is a push or a pull acting on an object.  Forces can make objects stop or start moving. | **Notice that some forces need contact between 2 objects.** | force  push  pull |
| Investigate how a toy car moves over different surfaces. | Forces change the motion of an object. They can make it start to move, speed up, slow down or stop.  Friction is a force that pushes against a moving object. | Investigate speed of a toy car over different surfaces – focus on predictions and analysis – rougher surfaces make the car go slower.  **Compare how things move on different surfaces.** | surface  friction |
| Sort magnetic and non-magnetic materials. | A magnet produces a magnetic field around itself.  Certain objects are attracted to the magnet and pulled towards it.  All magnetic materials are metal but not all metals are magnetic. | **Notice that magnetic forces can act at a distance and attract some materials and not others.**  **Compare and group materials according to whether they are magnetic.** | magnet  magnetic  non-magnetic  magnetic field  attracted  invisible  iron filings |
| Investigate the strength of magnets. | Some magnets are stronger than others. | Investigate strength of different magnets. Focus on prediction and analysis – is there a link between size of the magnet and strength? Not necessarily, but it challenges the children’s expectations.  **Observe how magnets attract or repel each other and attract some materials and not others.** | prediction  conclusion |
| Explore magnetic poles. | A magnet has two poles – north and south.  Opposite poles attract each other, while two of the same poles will repel each other.  The Earth has a magnetic field – there is a north pole and south pole. Explorers use compasses to find out where they are.  A magnet in water will always point north-south. | Make a compass.  **Describe magnets as having 2 poles.**  **Predict whether 2 magnets will attract or repel each other, depending on which poles are facing.** | north pole  south pole  attract  repel  compass |
| Observe how magnets attract some materials. | Magnets can be used for a variety of purposes. | Make, play and evaluate a magnetic game.  Observe how magnets attract or repel each other and attract some materials and not others. |  |