
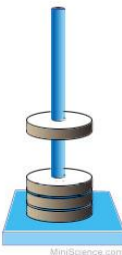
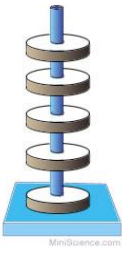


Learning journey	Science	Forces (Magnets and their effects.)	Year 3 Summer 2	
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Building on prior learning	Theme overview	Preparing for future learning	Vocabulary
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<p>In key stage 1 children learn about pushes, pulls and their effects as an introduction to forces.</p> <p>They will have tested the strength of materials. When testing strength of materials they will have related this to how forces can change a material's shape.</p>	<p>Chapter 1: What magnets do.</p> <p>Chapter 2: Magnets don't need to touch.</p> <p>Chapter 3: Magnets attract and repel.</p> <p>Chapter 4: What affects magnetic strength?</p>	<p>The next linked unit of work is forces that oppose motion in Y5. They will learn about water and air resistance, friction, managing forces using levers and pulleys.</p>	<p>Push, pull, attract, repel, force, non-contact.</p> <ul style="list-style-type: none"> • North pole, south pole. • Magnet, magnetic, non-magnetic. • Metal, non-metal • Stronger, weaker
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NC coverage and HWJS skills development	Knowledge organisers
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<p><u>National curriculum coverage for Science</u></p> <ul style="list-style-type: none"> • 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. <p><u>HWJS skills development</u></p>	<p>Chapter 1: What magnets do. Magnets exert attractive forces on some metals.</p> <p>Chapter 2: Magnets don't need to touch. Magnetic forces work through other materials including air, so magnets don't need to be touching to exert their force. It is called a non-contact force.</p> <p>Chapter 3: Magnets attract and repel. Each end of a magnet is called a pole, opposite poles are called north and south. Magnets exert attractive forces on each other when the poles facing</p>	<p>A key experiment that children should work through in this unit is to investigate ring magnets. They learn that they can be stacked to create a variety of patterns depending on how their poles are arranged. Children are challenged to recreate these patterns and explain how they did it - see diagram below:</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div>
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What does behaving like scientists mean, can I define it?

What must I teach children so they can do these things?

- 1a. Use my scientific knowledge to predict what might happen.
- 1b. Sometimes I will also need to draw upon observations to help me predict
- 2a. Use my scientific knowledge to hypothesise why *something* happened.
- 2b. Sometimes I will also need to draw upon observations to help me hypothesise, these may be from my own experiments or from secondary sources (e.g. when hypothesising why some planets have more moons than others)
- 3. Plan to investigate how one thing affects another
- 4. Use evidence to describe how one thing affects another

- **Precise ideas as defined by learning journeys.**
 - How to observe closely and carefully enough.
 - How to measure precisely enough and with appropriate resolution.
- **Precise ideas as defined by learning journeys.**
 - How to observe closely and carefully enough.
 - How to measure precisely enough and with appropriate resolution.
- **How to identify, measure and control variables in cause and effect investigations.**
- **How to use evidence to describe how one variable affects another.**



A Model of Progression.

1. Pose problems that require the application of knowledge being taught.
2. Deconstruct the problem to define what a child must understand and be able to do to tackle the problem (including what they need to observe and measure), teach these skills and knowledge **at that point.**
3. As children progress through the curriculum they will tackle problems using new ideas, and when the problem requires with closer observation and more precise measurement.

Good enough progression is being able to tackle these problems

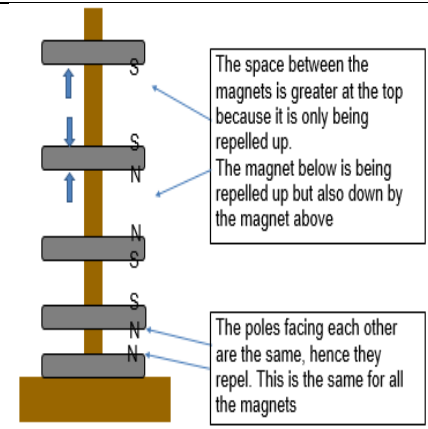
Children gather evidence to describe the relationship between variables (cause and effect) by identifying what must be changed, what measured and what must be kept the same.

each other are north and south (opposites). Magnets exert repulsive forces on each other when the poles facing each other are the same.

Chapter 4: What affects magnetic strength?

The strength of magnetic forces are affected by:

- The strength of the magnet.
- The distance between the magnet and the object.
- The material the object is made from.



1. What makes this a good labelled diagram?
2. What success criteria would you set for children when constructing labelled diagrams?

<p><u>Connections / deepening understanding</u></p> <p>How is the understanding of this area deepened in other areas of the curriculum? What links are there in the other subjects in the curriculum?</p>	<p><u>RADE</u></p> <p>Are the rights of the child relevant in this area of study - do they get referred to in the work?</p>	<p><u>Assessment</u></p> <p>By the end of the unit the children will be able to ... Details of the objectives that they will have covered within this unit of work</p>		
<p>English — Note making and report writing. Geography – Compasses pointing to magnetic north.</p>		<p>Describe magnets as having two poles and predict whether two magnets will repel or attract</p>	<p>Identify magnetic materials and observe how they attract or repel each other – often working through other materials.</p>	<p>Describe how magnetic forces are affected by distance from objects. Magnets don't have to touch to exert a force.</p>
<p>Assessment recording for the unit - checking the level of pitch of the work</p>				
<p><u>Key skill(s)/ knowledge to be assessed by the end of the unit</u></p>	<p><u>Lower attaining</u></p>	<p><u>Middle attaining</u></p>	<p><u>Higher attaining</u></p>	
<p>Details of key skill(s) that this unit will cover</p> <p>Magnets exert attractive forces on some metals</p> <p>Magnetic forces work through other materials including air, so magnets don't need to be touching to exert their force. It is called a non-contact force</p> <p>Each end of a magnet is called a pole, opposite poles are called north and south.</p> <p>Magnets exert attractive forces on each other when the poles facing each other are north and south (opposites).</p> <p>Magnets exert repulsive forces on each other when the poles facing each other are the same.</p> <p>The strength of magnetic forces are affected by:</p> <ul style="list-style-type: none"> • The strength of the magnet. • The distance between the magnet and the object. 	<p>Description of the level of ability that the child has to use these skill(s)</p> <p>Pupils can describe how magnets pull at some metals and they stick to the magnet.</p> <p>They recognise that magnets can pull some metals towards them. So magnets don't have to touch to exert a force.</p> <p>They also work through thin layers of paper.</p> <p>Pupils can describe that magnets have a North and South pole. They understand that opposite poles attract and like poles repel.</p>	<p>Description of the level of ability that the child has to use these skill(s)</p> <p>Pupils can describe how magnets pull at some metals and they stick to the magnet. They can draw and label simple diagrams to show this.</p> <p>They recognise that magnets can pull some metals towards them. So magnets don't have to touch to exert a force. They begin to describe</p>	<p>Description of the level of ability that the child has to use these skill(s)</p> <p>Pupils can describe how magnets pull at some metals and they stick to the magnet. They can draw and label simple diagrams to show this. They can write a brief explanation of what is happening.</p> <p>They recognise that magnets can pull some metals towards them. So magnets don't have to touch to exert a force. They can write a short description to say that magnets need to be near the metal for this to happen.</p> <p>They can describe that magnets work through materials (including air.) and that the force weakens as distance increases or thickness of a material increases. They may begin to design their own experiments to measure this.</p> <p>Pupils can describe that magnets have a North and South pole. They understand that opposite poles attract and like poles repel. They begin to explain and draw diagrams that show that the strength of magnetic forces are affected by</p> <ul style="list-style-type: none"> • The strength of the magnet. • The distance between the magnet and the object. • The material the object is made from. 	

<ul style="list-style-type: none"> The material the object is made from. 		<p>that the magnets need to be near the metal for this to happen.</p> <p>They can describe that magnets work through materials (including air.) and begin to describe that the force weakens as distance increases or thickness of a material increases.</p> <p>Pupils can describe that magnets have a North and South pole.</p> <p>They understand that opposite poles attract and like poles repel.</p> <p>They can draw and label diagrams to show this and make predictive diagrams to suggest what will happen with a variety of different magnets.</p>	
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NB: The assessments are completed for two reasons – to enable the class teacher and in turn the subject leader to evaluate the pitch of the learning within the unit in order to consider any necessary updates and for the class teacher to report to parents on the attainment of pupils in the end of year reports