Jeavons Wood Primary School – Science Knowledge Organiser

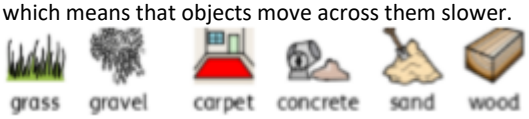
Topic: Forces and Magnets	Year: 3	Strand: Physics

Big Question: What can light do?

What should I already know?

The shape of some materials can be changed when they are stretched, twisted, bent and squashed. Know how different toys move. Know what a force is and be able to explain that a push and pull are types of forces. That when forces are applied to an object they allow them to move or stop moving. The strength of the force determines how far and fast an object moves

What will I know by the end of the unit?

Forces	*Forces are pushes and pulls. *These forces change the motion of an object. * They will make it start to move or speed up, slow it down or even make it stop. *For example, when a cyclist pushes down on the pedals of a bike, it begins to move. The harder the cyclist pedals, the faster the bike moves. *When the cyclist pulls the brakes, the bike slows down and eventually stops.
How do different surfaces affect the motion of an object?	Forces act in opposite directions to each other. * When an object moves across a surface, friction acts as an opposite force. * Friction is a force that holds back the motion of an object. * Some surfaces create more friction than others which means that objects move across them slower.  grass gravel carpet concrete sand wood *On a ramp, the force that causes the object to move downwards is gravity. *Objects move differently depending on the surface of the object itself and the surface of the ramp.
How do magnets work?	*Magnets produce an area of force around them called a magnetic field. *When objects enter this magnetic field, they will be attracted to or repelled from the magnet if they are magnetic. *When magnets repel, the push each other away *When magnets attract, they pull together.
Which materials are magnetic?	*Objects that are magnetic, are attracted to magnets. *Iron and steel are magnetic. *Aluminium and copper are non-magnetic.

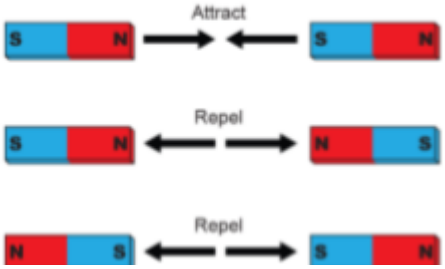
Where will my learning go next?

In Year 5 pupils will be taught to:

Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. Identify the effects of air resistance, water resistance and friction, that act between moving surfaces. Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

Diagrams

How do magnetic poles work?
*The ends of a magnet are called poles.
*One end is called the north pole and the other end is called the south pole.
*Opposite poles attract, similar poles repel.
*If you place two magnets so the south pole of one faces the north pole of the other, the magnets will move towards each other. This is called attraction.
*If you place the magnets so that two of the same poles face each other, the magnets will move away from each other. They are repelling each other



Vocabulary

attract	If one object attracts another object, it causes the second object to move towards it
bendy	bendy an object that bends easily into a curved shape
friction	the resistance of motion when there is contact between two surfaces
force	the pulling or pushing effect that something has on something else
gravity	the force which causes things to drop to the ground
magnet	a piece of iron or other material which attracts magnetic materials towards it
magnetic field	an area around a magnet, or something functioning as a magnet, in which the magnet's power to attract things is felt
metal	a hard substance such as iron, steel, gold, or lead
motion	the activity of changing position or moving from one place to another
non-magnetic	an object that is not magnetic
opposite	Opposite is used to describe things of the same kind which are completely different in a particular way. For example, north and south are opposite directions
pull	When you pull something, you hold it firmly and use force in order to move it towards you or away from its previous position
push	When you push something, you use force to make it move away from you or away from its previous position
resistance	a force which slows down a moving object or vehicle

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Big Question: Are all materials magnetic?

Question 1: The pulling or pushing effect that something has on something else can be best described as a….	Start of unit:	End of unit:

Question 2: Which force pulls objects towards the ground?	Start of unit:	End of unit:
resistance		
magnetism		
gravity		

Question 3: Which of these surfaces would create the most friction for a cyclist riding their bike?	Start of unit:	End of unit:
sand		
concrete		
polished wood		

Question 4: What is motion?	Start of unit:	End of unit:
Changing size		
Holding still		
Changing shape		
Moving from one place to another		

Question 5: Which force acts as resistance when one object moves against another?	Start of unit:	End of unit:
resistance		
magnetism		
gravity		

Question 6: You design an experiment to see how far an object moves on ramps of different surfaces. What must you do to keep the test fair?	Start of unit:	End of unit:
keep the object the same for all ramps		
the ramps must all be the same length		
the object must have the same starting point before it starts moving		
all of the above		

Question 7: How can you test which materials are magnetic?	Start of unit:	End of unit:
see which objects are attracted to a magnet		
see which objects are repelled by a magnet		
see which objects are not affected by a magnet at all.		

Question 8: For each of these diagrams, state whether these magnets will attract or repel each other.	Start of unit:	End of unit:
 _____		
 _____		
 _____		

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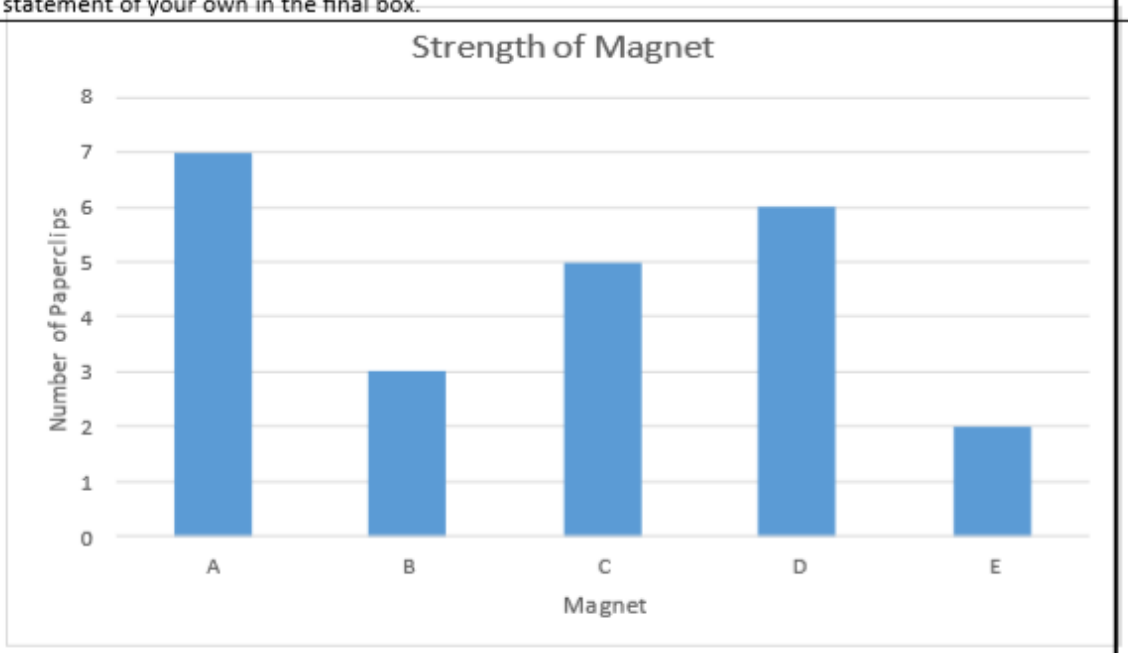
Question 9: You devise an experiment to test the strength of 5 magnets. You label them A-E and then test to see how many identical paperclips (in a chain) they attracted. All of the results have been placed in a bar graph. Write T or F to indicate if the statements are true or false. Write a true statement of your own in the final box.	Start of unit:	End of unit:
		
Magnet A is the strongest magnet		
Magnet C attracted a longer paperclip chain than Magnet D		
Magnet B is the weakest magnet		
The chain that Magnet D could hold had six paperclips		
The paperclips have to be identical to make the test fair.		
	T	

Question 10: You find a new magnet and label it Magnet F. It can hold a chain of 4 identical paperclips. Show that on the graph below. Use a ruler.	Start of unit:	End of unit: