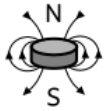
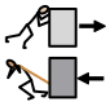
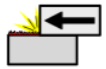
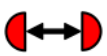
Year 3 Science – Forces and Magnets

Vocabulary

Magnet	An object which has a magnetic force and is able to attract or repel other objects.	
Magnetic	Materials that are attracted to magnets	
Magnetic field	The space around a magnet that has magnetic force.	
Poles	The ends of a magnet (north and south)	
Repel	A force that pushes two magnetic things away from each other.	
Attract	A force that pulls things together	
Forces	A push or a pull. Gravity is an example of a non-contact force.	
Friction	A force acting between two surfaces or things making them move one way or another.	
Surface	The top layer of something.	
Impact	When high force is applied over a short period of time	
Resist	Forces moving in opposite directions	

Knowledge

Forces - a force can be through a **push** or a **pull** force.

These are either **contact** or **non-contact forces,** there are different types of contact force:

Impact force (where two surfaces collide),
Frictional force (when two surfaces are already in contact)
Strain forces (when an elastic material is stretched or squashed)

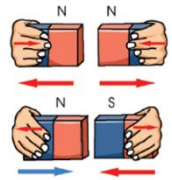
When objects move across a surface there is always **friction.**

When certain objects rub against each other, sometimes they can cause larger or smaller amounts of friction. Smoother objects create less friction and rougher surfaces create more friction.

Know that objects **resist** movement on rougher surfaces because there is higher friction as the object moves across it.

Non-contact forces can act between objects without them touching such as and **magnetism** and **gravity.**

Magnets
Magnets have two **poles** called north and south. When two of the same poles are put together (south-south and north-north) they **repel** each other and opposite poles of magnets (north-south) **attract** each other.



When magnets repel this is a push force. When magnets attract this is a pull force.

There is a **magnetic field** around a magnet which attracts or repels objects.

Some materials are **magnetic,** meaning that they are attracted to a magnet.
Most metals are magnetic.
Materials such as wood, wood, plastic and leather are not magnetic.

Magnets can only be made out iron, cobalt and nickel.

Quizzing

Ask your partner the questions below. Can they find the correct answer on the right-hand side?

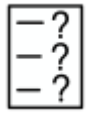
What is an example of a contact force?	Magnetism
Friction is never present when objects move across a surface. True or False	They attract
What is an example of a non-contact force?	Strain
What happens when the same poles of two magnets are brought together?	False
What happens when different poles of two magnets are brought together?	Magnetic Field
What material is typically magnetic?	They repel
Magnets can only be made from iron, cobalt or nickel. True or False	North and South
What is the name of the invisible area around a magnet?	True
What are the two poles of a magnet called?	Metal

Quiz at home

Ask your adult to look at the KO.

Quiz them using the vocabulary and knowledge section or the quiz questions.

- Can they beat your score?
- Can they score more than 5? 10?
- Compete with your adult in the elimination quiz. Take it in turn to ask each other questions. The first person to get a question wrong is out.



BIG Questions

What would happen if friction didn't exist at all?

Which force is the strongest? Push, pull or magnetism?

Can you feel a force even when you can't see it?

If you stacked two magnets together, would they be twice as strong?

Can you make an object float using forces?

Beat the adult

Your teacher can give **10 facts** in **1 minute** about this topic.

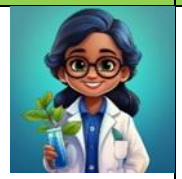
How many can you give to your partner?

Word scramble

Unscramble the key vocabulary from this topic below. You can create your own at the bottom

frecsua	
tmegan	
oeslp	
eistrs	
atcattr	
rfinioct	
mpicat	
mcatigneiledf	

Creative Tasks



Design your own quiz using the information in the knowledge organiser.

Design a maze using card. Using a magnet underneath the maze can you move a metal paperclip through it to the finish.

Create a comic strip about a superhero who rescues a robot using magnetic powers. You must include the following words: Attract, repel, metal, force and poles.

Build a machine using recyclable material that is able to move another object using a push or pull force.

Challenge

You have been given three different magnets and some paperclips.

A bar magnet

A horseshoe magnet

A ring magnet

Design a fair test you could carry out to see which magnet is the strongest.

Enquiry

Magnets – Repel / Attract

These magnets _____ each other.

These magnets _____ each other.

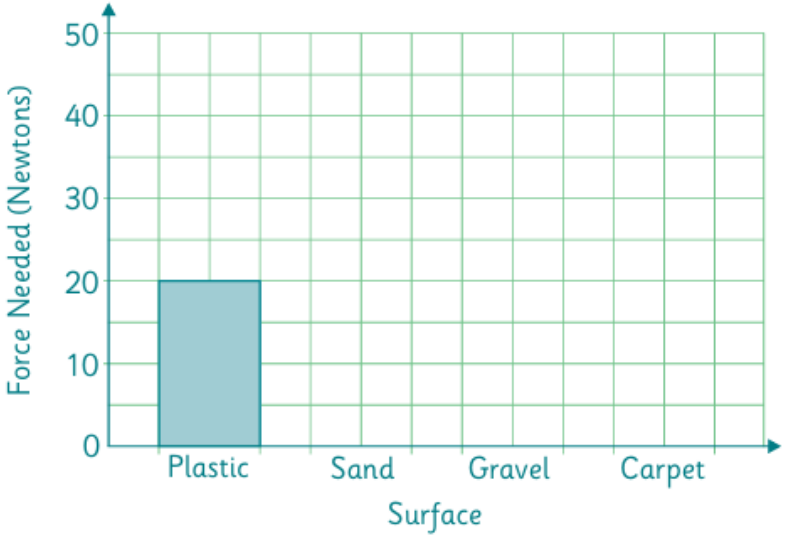
These magnets _____ each other.

Using graphs

Year 3 measure how much force is needed to pull a weight across different surfaces. Their results are show in the table below.

Surface	Plastic	Sand	Gravel	Carpet
Force Needed (Newtons)	20	50	30	25

Use the results to complete the bar graph below



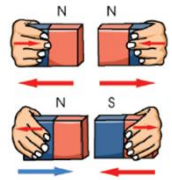
Predictions / Testing

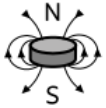
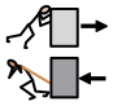
For each object say whether you think it is magnetic. Then test this using a magnet. Record your results in the table below.

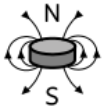
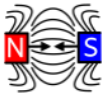
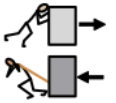
Object	Do you think it's magnetic?	Was it magnetic?
Steel spoon		
Plastic spoon		
Coin		
Pencil		
Paperclip		
Marble		
Scissors		

Can you spot a pattern in the materials magnetic objects are made from?

Are there any objects that break the pattern?

Knowledge	Knowledge
Forces –	**Forces** - a force can be through
Impact force -	These are either ( ) there are different types of contact force:
Frictional force -	**Impact** force (where two surfaces collide),
Strain forces -	orce (when two surfaces are already in contact) **Strain** forces (when an elastic material is stretched or squashed)
Friction.	When objects move across a surface there is always When certain objects rub against each other, sometimes they can cause larger or smaller amounts of friction. Smoother objects create less friction and surfaces create more friction.
Non-contact Forces	Know that objects movement on rougher surfaces because there is higher friction as the object moves across it. forces can act between objects without them touching such as and **magnetism** and **gravity.**
Magnets	**Magnets** Magnets have two called north and south. When two of the same poles are put together (south-south and north-north) they each other and opposite poles of magnets (north-south) **attract** each other.  When magnets repel this is a push force. When magnets attract this is a pull force. There is a around a magnet which attracts or repels objects. Some materials are **magnetic,** meaning that they are attracted to a magnet. Most metals are magnetic. Materials such as are not magnetic. Magnets can only be made out iron, cobalt and

Write the definition for each of the following words		
Vocabulary		
Magnet		
Magnetic		
Magnetic field		
Poles		
Repel		
Attract		
Forces		
Friction		
Surface		
Impact		
Resist		

Write the vocabulary word for each definition		
Vocabulary		
	An object which has a magnetic force and is able to attract or repel other objects.	
	Materials that are attracted to magnets	
	The space around a magnet that has magnetic force.	
	The ends of a magnet (north and south)	
	A force that pushes two magnetic things away from each other.	
	A force that pulls things together	
	A push or a pull. Gravity is an example of a non-contact force.	
	A force acting between two surfaces or things making them move one way or another.	
	The top layer of something.	
	When high force is applied over a short period of time	
	Forces moving in opposite directions