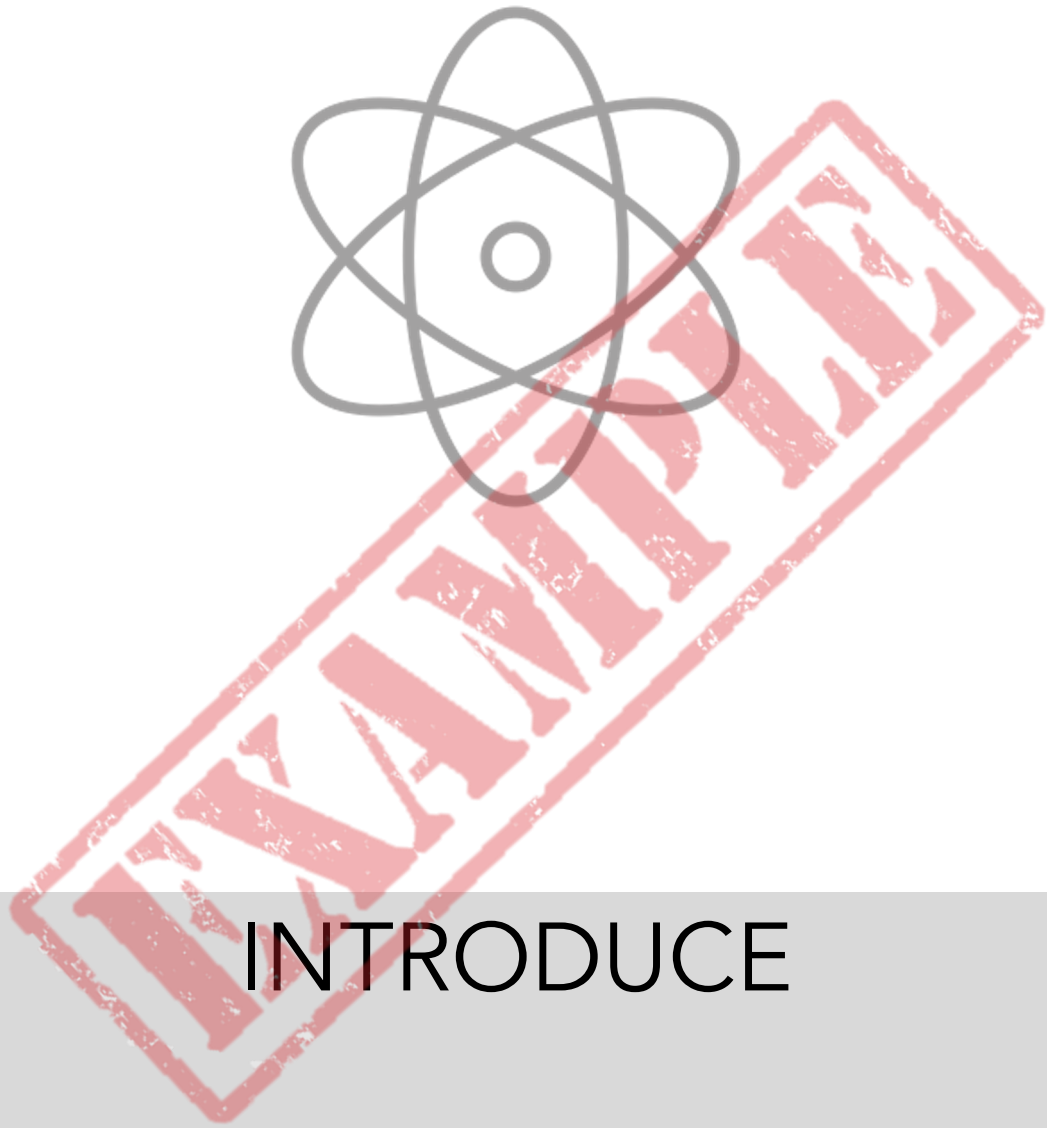


INTRODUCE

Year 3

|

Forces and magnets

SCIENCE

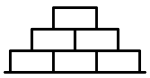
Forces and Magnets

Year 3
Spring Term

Forces and magnets

- 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

Previous learning



Year 1
Everyday materials

Year 2
Uses of everyday materials

Ask relevant questions	Set up simple, practical enquiries and comparative and fair tests	Make accurate measurements using standard units, using a range of equipment, e.g. thermometers and data loggers	Gather, record, classify and present data in a variety of ways to help in answering questions	Record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables	Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	Use results to draw simple conclusions and suggest improvements, new questions and predictions for setting up further tests	Identify differences, similarities or changes related to simple, scientific ideas and processes

Academic and elaborative vocabulary (Tier 2)

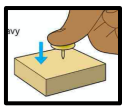
consequence	result or effect	factor	a thing that affects a decision or situation
assume	believe without proof	similar	things that are very alike
		define	tell or show something very clearly

Knowledge Organiser

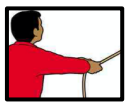
A contact force occurs when two objects physically touch

Contact force

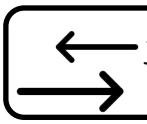
push



pull



twist or **turn** = push + pull



forces act in **opposite** directions

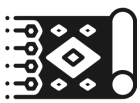
friction is the force that stops things from moving

resistance is a force that slows down an object that is moving

surfaces change how objects move (**motion**) over them

grass

carpet



wood

table

rough

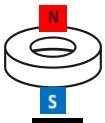
smooth

Non-contact force

A force that acts on an object without touching it

magnets

horseshoe



ring

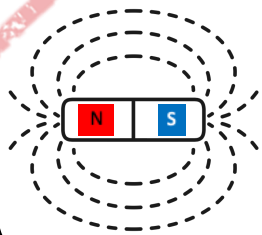
bar

magnets always have a north and south pole

North South

magnetic field

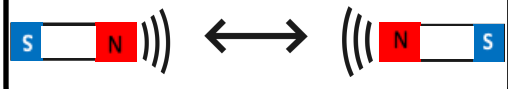
North



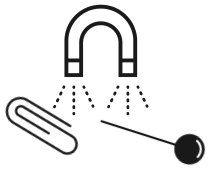
South

opposite poles attract

similar poles repel



magnetic materials



iron and steel

non-magnetic

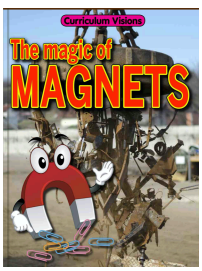
copper and aluminium

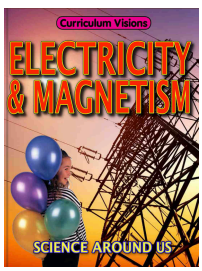
Forces and magnets study summary

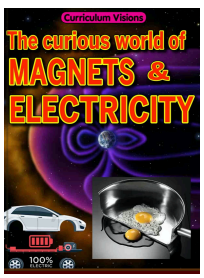
Suggested Lesson	Learning question	Question
1	What are contact forces?	1 and 2
2	How do surfaces affect the motion of an object?	1 - 4
3	How does friction affect moving objects?	1 - 7
4	What is a non-contact force? How is this different to a contact force?	1 - 9
5	How do magnets attract and repel?	1 - 13
6	Which materials are magnetic? Forces and magnetism summary	1 - 16

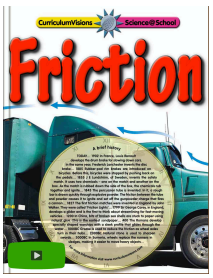
Curriculum Visions Resources and video books

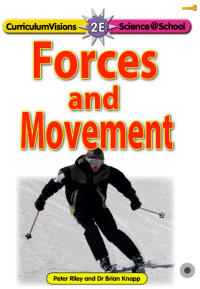
Other books

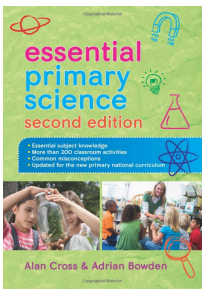


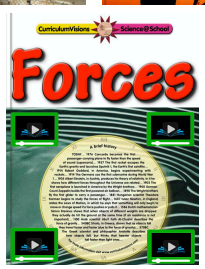












Click on the link below to import this quiz to your Socrative account

https://b.socrative.com/teacher/#import-quiz/43656268

Cumulative quiz

It's most effective if you use these questions through cumulative quizzing

Lesson by lesson

|

Teach | Test | Teach | Test | Teach| Test | Test

socrative

AB Year 3 Forces and Magnets Score: _____

1. **Select the contact forces**

(A) push
(B) gravity
(C) pull
(D) twist or turn
(E) magnetism

2. **Is resistance a force?**

(A) Yes - resistance is a force.
(B) No - resistance is not a force.

3. **Resistance is a force that...**

(A) **speeds up** an object.
(B) **slows down** an object.
(C) **doesn't affect** an object.
(D) I'm not sure.

4. **A rough surface will...**

(A) help an object move quickly.
(B) slow an object down or stop it.
(C) I'm not sure.

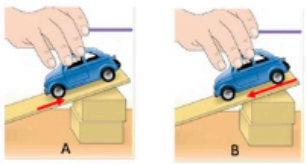
5. **Friction is...**

(A) the force that stops things moving.
(B) the force that helps things move better.
(C) I'm not sure.

6. **Friction opposes the the movement of an object.**

(A) True
(B) False

7. **Direction of friction - is it diagram A or B?**



(A) A - friction **opposes** the movement of the object.

(B) B - friction **supports** the movement of the object.

(C) I'm not sure.

8. **Select the non-contact forces**

(A) push

(B) magnetism

(C) twist

(D) pull

(E) gravity

9. **A contact force is the same as a non-contact force.**

(A) True

(B) False

10. **A magnet must have...**

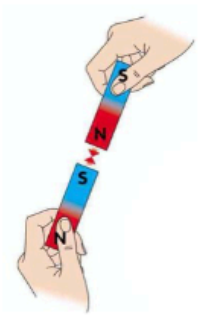
(A) south pole + south pole.

(B) north pole + south pole.

(C) north pole + north pole.

(D) I'm not sure

11. **These magnets are...**

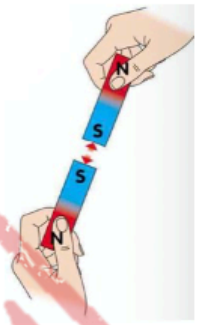


(A) attracting.

(B) repelling.

(C) I'm not sure.

12. **These magnets are...**

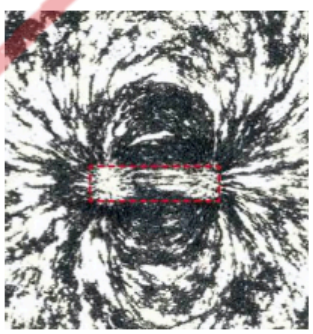


A attracting.

B repelling.

C I'm not sure.

13. **This image shows us the...**



A magnetic field.

B north and south poles.

C I'm not sure

14. **Iron and steel are materials that are attracted to magnets.**

A True

B False

15. **Select the materials that are not magnetic.**

A plastic

B iron

C wood

D paper

E steel

16. **Which everyday things would you find magnets in?**

A computer

B fridge

C speaker

D electric motor

Vital Vocabulary – words we love and use

Science: Forces and magnets

Word	What it means ?	Clue

Knowledge notes for planning

1
What is a contact force?

A contact force occurs when two objects physically touch

boot + football = contact force

push away

Does wind push or pull?

pull towards

Do round things roll all by themselves?

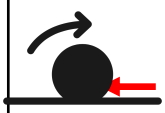
twist or turn - pushing or pulling

WORKING SCIENTIFICALLY

How are contact forces used in the classroom, PE or with toys?

2

How do surfaces affect the resistance of an object's movement?



resistance is a force that slows down an object that is moving.

forces act in **opposite** directions

WORKING SCIENTIFICALLY

Which surfaces increases or decreases resistance?

	grass
	wooden floor
	carpet or rug
	playground surface

What are the similarities and differences between these surfaces?

3

How does friction affect moving objects?

WORKING SCIENTIFICALLY

A forcemeter measures friction in Newtons (N)

Newtons (N) = units

It's like a ruler that measures length in cm or mm

Always measure twice to **check** your readings

How much force (N) is needed to lift a book?

How much force (N) is needed to drag a book across the table?

What do you notice? Is there a difference?

Try lifting and dragging an apple using a force meter. What do you notice?

4

What is a non-contact force?

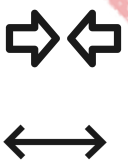
WORKING SCIENTIFICALLY

A force that acts on an object without touching it

gravity
non-contact force

The unseen force that pulls things to the ground

magnetism
non-contact force

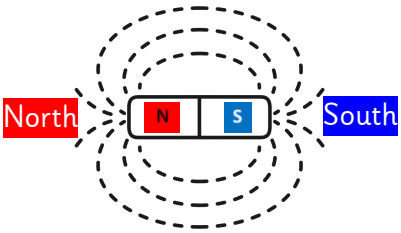


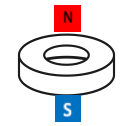
magnetism - The invisible push or pull that works between some materials

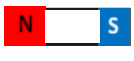
What's the difference between a contact and non-contact force?

5
How do magnets attract and repel objects?

Magnets have an invisible force field that repel or attract certain materials







Ring, bar or horseshoe magnets **all** have north and south poles

WORKING SCIENTIFICALLY

How can these magnetic ring magnets stay suspended without touching each other on the centre pole?

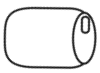
6

Which materials are magnetic?

Any material made of iron or steel

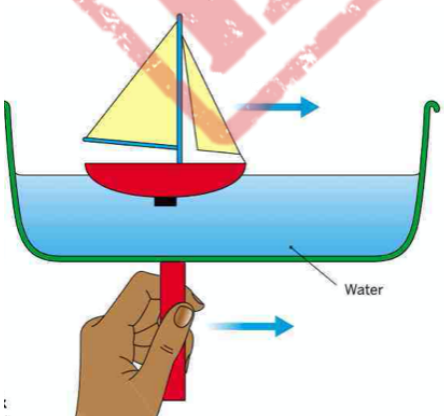
The magnetic field will only act on materials made of iron or steel

Not all metals are magnetic



aluminium and copper do not contain iron or steel

magnetic force can work through water



WORKING SCIENTIFICALLY

How can we sort and classify materials based on their magnetic properties?