UNIT 7. ELECTRICITY & MAGNETISM REVIEW

MAGNETISM & MAGNETS

1. Look at the photograph of the artificial magnet. What metal do you think the magnet is made of? How do you know?

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2. An artificial magnet will attract a paper clip but will not attract a gold ring. Why?

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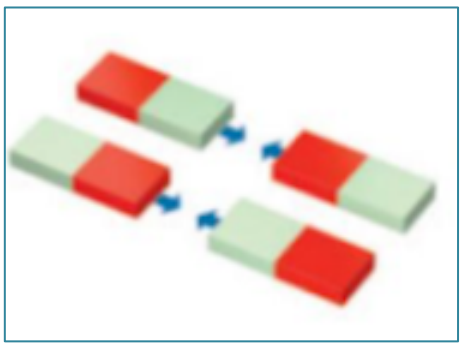
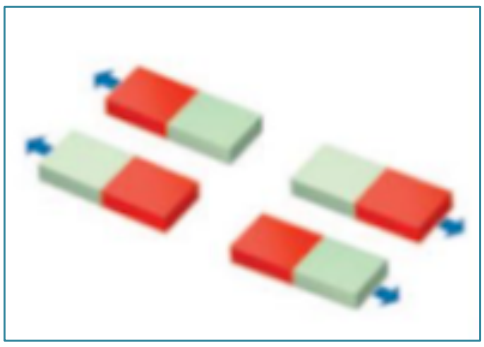
3. Look at the illustrations. What do the blue arrows indicate? Explain.





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4. Search the Internet for information about uses of magnets in everyday life.

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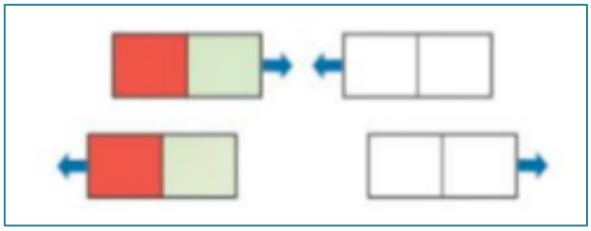
5. Which of the objects in the box will be attracted to magnets? Complete the table.

a wooden ruler - a tin can - an aluminium can - iron fillings - a steel key
an oxidised iron nail - a bone - a silver ring - nickel coins - a gold bar

magnetic objects	non-magnetic objects

6. Look at the diagram. Colour and label the poles of the magnets.



7. Explain the difference between permanent and temporary or induced magnets.

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8. How can we see the magnetic field around a magnet?

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9. What happens if you cut a magnet in half? _____

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10. Draw a diagram showing the Earth's magnetic poles. Explain the difference between the poles of the magnetosphere and the geographical poles.

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11. How do compasses work? Why are they useful instruments of navigation?

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12. How does the Earth's magnetic field protect us?

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13. What effects does the magnetic field cause? How are they called?

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14. The compass. Answer these questions about the compass.

- Why is the Earth a Magnet? _____

  _____

- Why do the Earth's magnetic poles move the needle on a compass? _____

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- Where will the needle of a compass point if you are in the Northern hemisphere? What if you are in the Southern hemisphere? _____

  _____

- Why does a compass always point north? Complete the explanation

attract - poles - magnet - north - needle

The Earth is an enormous _____ which has two magnetic _____. A compass is also a magnet and has two poles. Opposite poles _____. As a result, a compass needle always points to the Earth's magnetic _____ pole.

15. Read and write T (true) and F (false). Then, correct the false statements.

____ 1. The Earth's North Pole is in the same place as its magnetic north pole.

____ 2. The magnetosphere protects the Earth from harmful rays of the Sun.

____ 3. The north pole of a compass needle always points south.

____ 4. The north poles of two bar magnets attract each other.

____ 5. All magnetic materials are metals.

____ 6. Magnetic north is at the North Pole.

____7. Two magnets placed with the same poles together will be attracted to each other.

MAGENTISM & ELECTRICITY. ELECTROMAGNETS

16. What is an electromagnet? _____

_____

17. Why are electromagnets so important? _____

_____

18. Use these words to explain how an electromagnet works.

iron core - coil of wire - electricity - magnetic

_____

_____

_____

_____

19. How do you switch off an electromagnet? How do you reduce its magnetic strength?

_____

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20. Match to make sentences in your notebook.

___ a. Oersted discovered …	1. separate mixtures containing iron or steel.
___ b. He noticed that…	2. a simple electromagnetic motor.
___ c. Ampere discovered…	3. an electric current affects a compass needle.
___ d. Faraday invented…	4. produces a magnetic field when it is switched on.
____ e. An electromagnet…	5. that electricity and magnetism are connected.
____ f. It can be used to …	6. the particle that is now called the electron.

21. Complete the sentences with these words.

compass - magnetic field - magnets - electromagnets

1. _____ can attract iron, steel nickel and cobalt.
2. The area where magnetism occurs _____
3. _____ points to the Earth North Pole.
4. Most modern technology works with _____ .

22. Read and write T (true) and F (false). Then, correct the false statements.

____ 1. The link between electricity and magnetism was discovered by Faraday.

____ 2. Ampere discovered the electron, but didn't call it an electron.

____ 3. Electromagnets are used to separate mixtures containing soluble substances.

____ 4. Electric current produces a magnetic field when it flows through a wire.

____ 5. Electromagnets can be used to lift cars or move trains.

____ 6. Electromagnets are an example of a permanent magnet.

23. Search the Internet to find out about MRI scanners. Answer these questions in a paragraph.

- What do the letters MRI stand for?
- What are these machines used for?
- Who invented the MRI scanner?
- When did he invent it?

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DID YOU KNOW?

FLOATING TRAINS

Since the invention of the wheel, people have constantly tried to improve transport. Bicycles, trains, and cars have become faster and more efficient, but there is one problem they haven't completely solved: friction.

Surface, water and air friction reduce the speed of vehicles and increase energy consumption. Can friction be avoided?

To find out, scientists replaced the wheels of a train with magnets - with the north magnetic poles facing down. They also replaced the tracks with magnets - with the north magnetic poles facing up. These magnets repelled each other, and the train "floated" on the tracks!

In these magnetic levitation trains, called maglev trains, there is no physical contact between the tracks and the train. This is how they solved the problem of surface friction!

- What is the main problem all means of transport have? _____

  _____

  Make a list of means of transport. Which types of friction slow them down?

  _____

  _____

- How do maglev trains work? _____

  _____

  Which type of friction is avoided in the maglev trains? _____

  _____

- Find out where maglev trains run and how fast they go.

  _____

  Look at the front of the Maglev train in the photo. This shape helps to reduce another type of friction Which one? Do you know any other trains that use the same shape to reduce friction?

  _____

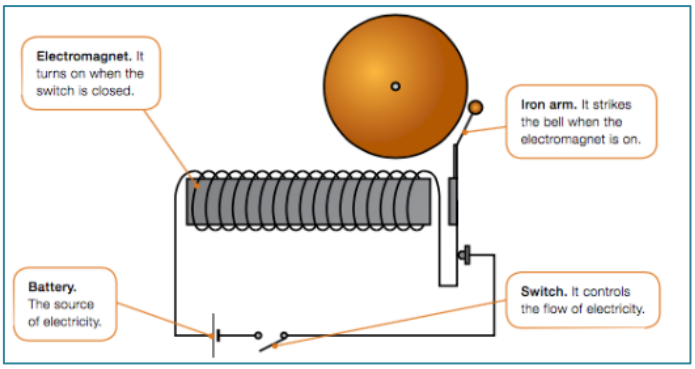
  _____

KNOW HOW TO

SCHOOL BELLS

Many school bells use an electromagnet:

- When the switch closes, the electromagnet turns on.
- The electromagnet attracts an iron arm to the bell.
- The iron arm strikes the bell. This opens the circuit and turns the electromagnet off.
- The iron arm returns to its original position. This closes the circuit and turns the electromagnet on again.
- The cycle repeats until the switch is opened.



In couples. Look at the diagram and try to describe how it works in your own words.
Search the Internet for information about other uses of electromagnets in everyday life.

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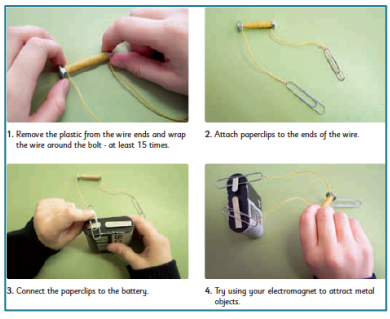
EXPERIMENT

Make your own electromagnet

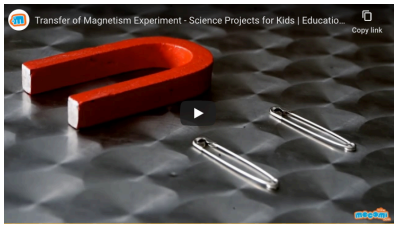
https://youtu.be/cxELqN7wjS0

https://youtu.be/PwVuLK0Q-po



EXPERIMENT

Transfer of magnetism



https://mocomi.com/transfer-of-magnetism/