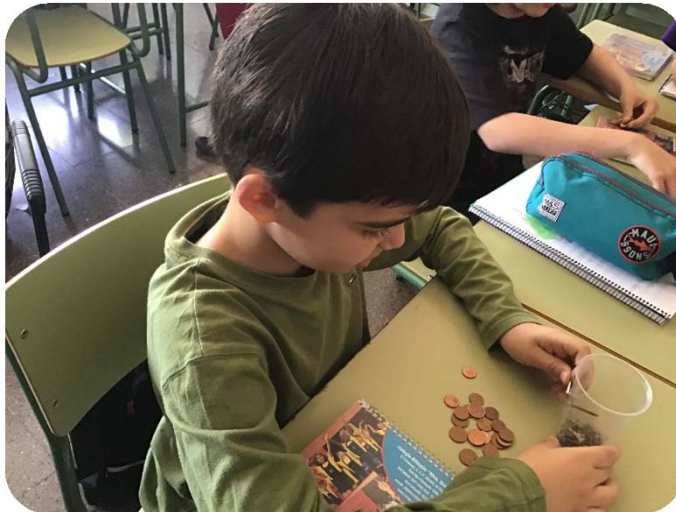


DISCOVERING MAGNETISM



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Esta experiencia se ha llevado a cabo en la clase de Cuarto de Educación Primaria del CBM Nuestra Señora de los Ángeles de El Esparragal (Murcia) Proyecto realizado por:

- ▶ ASCENSIÓN LÓPEZ ESPÍN (MAESTRA ESPECIALISTA)
- ▶ AMPARO SOTO BALLESTER (TUTORA)
- ▶ SERAFINA FERNÁNDEZ (MAESTRA ESPECIALISTA COLABORADORA)
- ▶ MARIA DOLORES SANZ RODRÍGUEZ (DIRECTORA)

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El Esparragal
Murcia

WHAT IS MAGNETISM?

WHAT FORCES DO YOU KNOW? _____

WHAT IS MAGNETISM? _____

CAN YOU FEEL IT? _____

WHAT ARE MAGNETS? _____

DO YOU KNOW ABOUT ANY SCIENTIST RELATED
TO MAGNETISM? _____

WHAT DO YOU WANT TO KNOW ABOUT MAGNETS?? _____

WORK IN PAIRS AND WRITE YOUR ANSWERS IN YOUR
NOTEBOOKS

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First Session Photos



Nuestra Señora de los Angeles (El Esparragal-Murcia) Fourth Year Classroom



FIRST SESSION

WHAT DO YOU KNOW ABOUT ELECTRICITY AND MAGNETISM?

We start the lesson by questioning our students about what they know about magnetism and electricity (annexed 1)

Experiments:

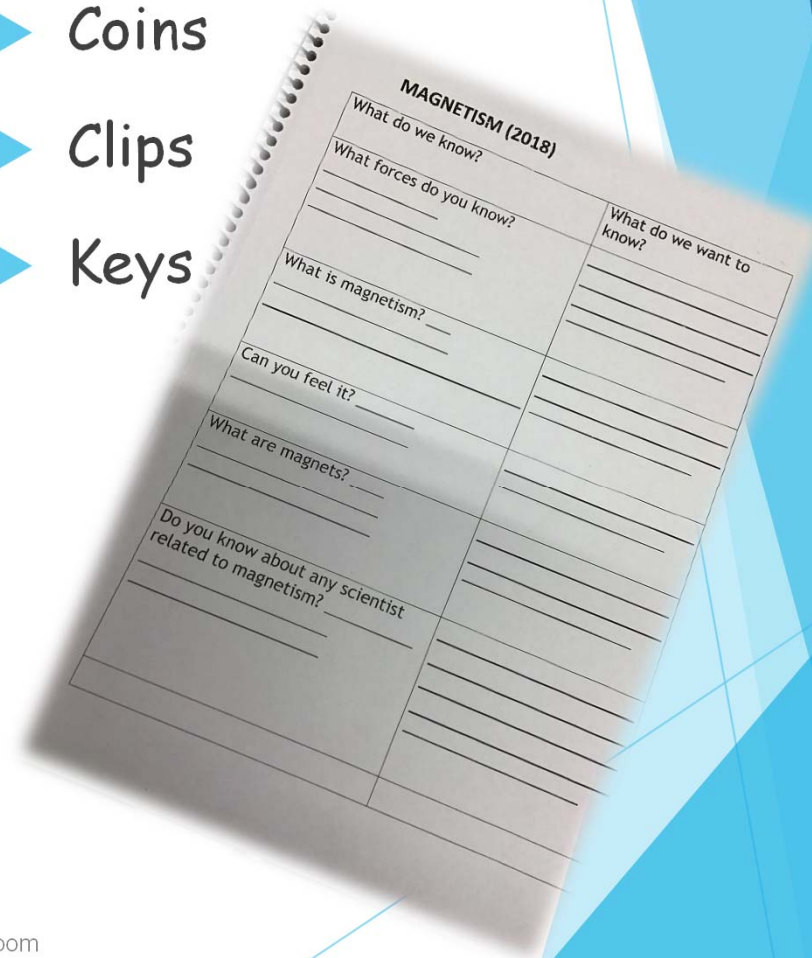
- With magnets we are looking for magnetic objects in the classroom
- We use magnets with coins and we make a chain
- We use keys with magnets and make a chain
- What is the power of magnets that can influence the behavior of a non-magnetic object?
- Is Magnetism a contact force or a non-contact force?

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First session material

- ▶ Material:
- ▶ Notebooks
- ▶ Worksheet
- ▶ For the experiment:
- ▶ Magnet
- ▶ Classroom objects
- ▶ Coins
- ▶ Clips
- ▶ Keys



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First Session Conclusions

- ▶ Magnetism is a force. You can see or feel it but its around us.
- ▶ Conclusions: Magnets attract other material.
- ▶ Magnets attract only metals but not all metals.
- ▶ Magnets are able to transmit their properties to other objects.

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Second session photos



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SECOND SESSION PLANNING

- We continue experimenting with magnets and its behavior which each other. Today we are going to start by using magnets through different material to discover if magnets are able to move objects. Later we will use the thread and clip to see if magnets are able to attract the clip without touching it.

Experiments:

- Plastic cups with coins or keys inside. Using magnets, we try to move these objects.
- Tie a clip with the thread and put close a magnet. The clip spins on the air.
- Bottle of water, thread, magnet and nail. Tie the bottle to de nail and use the magnet to hold on the bottle. The weight of the water is the magnetic force.
- If we have time, we can experience how the magnets behave to each other.



Second session material

Material

- ▶ Notebook
- ▶ Magnets
- ▶ Clips
- ▶ Thread
- ▶ Can of cola
- ▶ Bottle of water
- ▶ Pins
- ▶ Keys/ Coins

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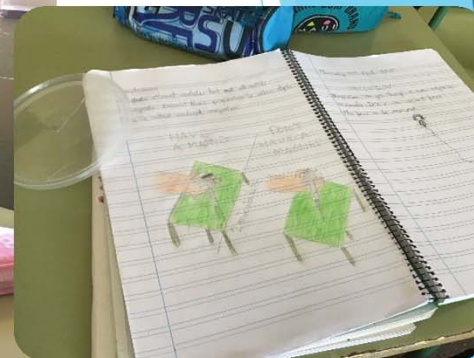
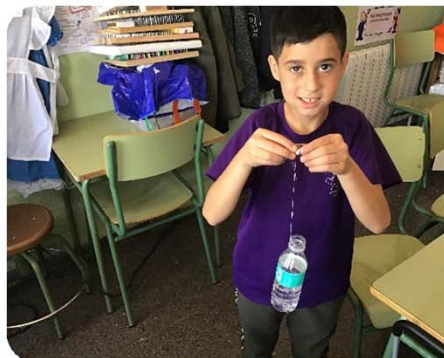
Second Session Conclusions

- ▶ Conclusions:
- ▶ Magnetism is a non-contact force. Through different material, the magnet is still effective
- ▶ Magnetism can go through non-magnetic materials.
- ▶ Magnetism can be measured (Bottle water)

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THIRD SESSION



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Third session planning

We start the lesson by summarizing what we know about Magnetism:

- Magnetism is a non-contact force.
- Magnets attract metal but not all metal (cobalt, nickel and iron)
- Magnets transmit their properties to other material (ferromagnetic)

Induced Magnetism

- Ferromagnetic material can behave like magnets (domains). Magnetism remains after the magnet has taken off.

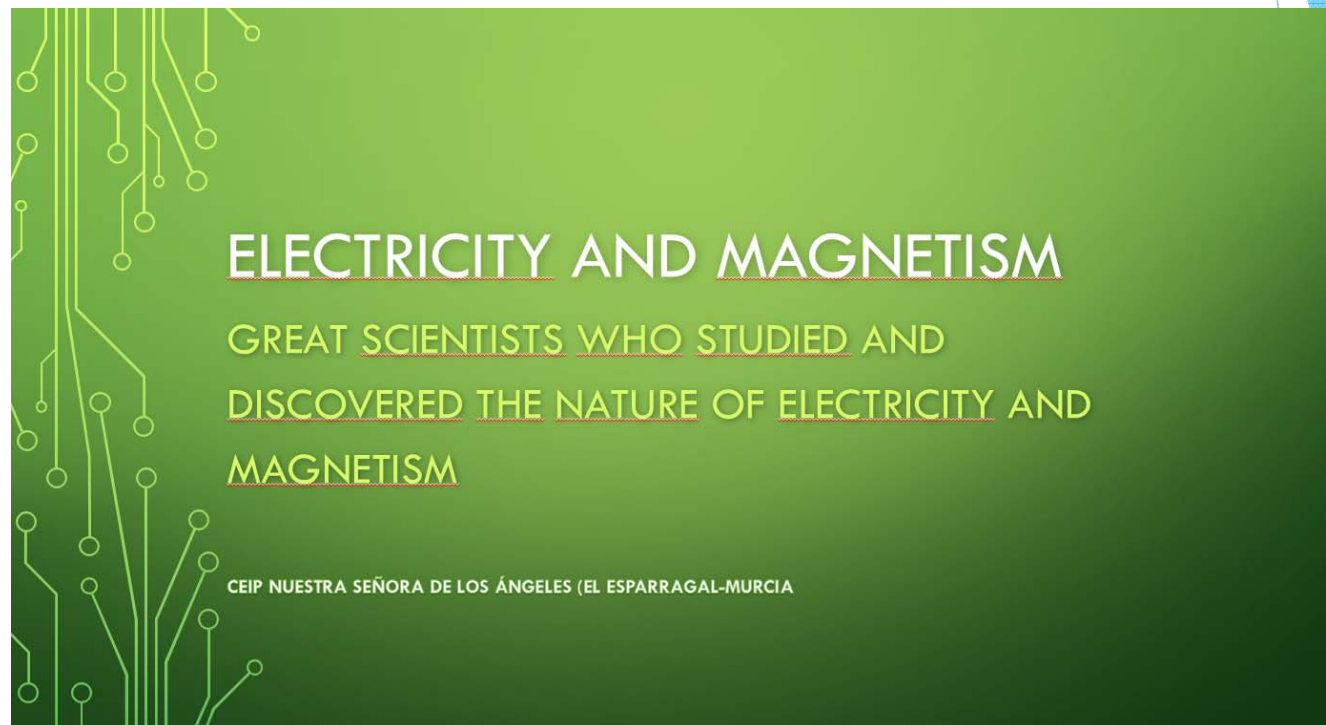
Experiments:

- Labelling magnets' poles
- Magnetized scissors, pins, clips. In this way, we can prove that temporary magnetism makes some material to behave like a magnet.
- How to demagnetized a material (spin the magnet near the object)

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PPP Scientists who discovered the Nature of Magnetism



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Third session material

- ▶ Pins
- ▶ Magnets
- ▶ Clips
- ▶ Scissors

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Third Session Conclusions

- ▶ Conclusions: Laws of magnetism: the equals repel each other, the different attract
- ▶ There are some materials that act like a magnet but they are not magnets. It is due to domains.
- ▶ The domains are like groups of little magnets inside the material (iron, nickel, cobalt)

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FOURTH SESSION



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Fourth session planning

- ▶ We are going to start with the definition of magnet: a magnet is a material that has the property of attracting the iron, nickel and cobalt.
- ▶ **We are going to start the lesson by summarizing what we learnt last day:**
- ▶ Temporary or remaining magnetism is caused by domains. Inside the ferromagnetic material, there are tiny magnets that are disordered. When you put a magnet close to this material, it will put in order these little magnets and they behave like a magnet.
- ▶ Having said that, we are going to use compasses to experiment how a magnet has influenced on the compass. This way we can see the vectors of the magnetic field.
- ▶ Experiments:
- ▶ Shoes box with needles to show domains
- ▶ Magnets in the centre of the group, using a compass we will draw the lines
- ▶ The lines are representing at the magnetic field of magnets.
- ▶ We will put magnets on spoons to see if they point to the same direction.
- ▶ We will prepare water compass with magnetized pins and we will check the next day to see if happens the same.

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Fourth session material

- ▶ **Material**
- ▶ Magnets
- ▶ Notebook
- ▶ Digital board
- ▶ Pencil
- ▶ Spoons
- ▶ Shoes box
- ▶ Needles
- ▶ Compasses

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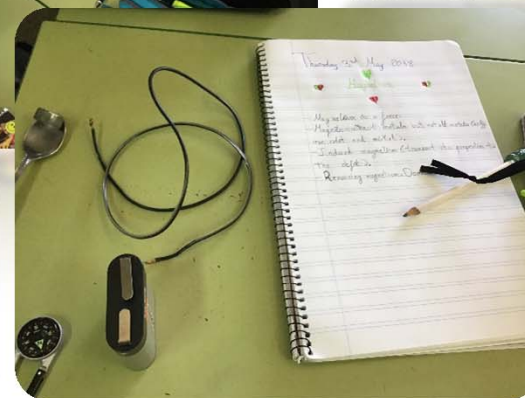
Fourth session conclusions

- ▶ Magnets pull on magnetic materials, such as iron, nickel, cobalt and steel, but pull through non-magnetic things, like cardboard, glass, plastic and wood. Magnets can even travel through water.
- ▶ Only metals are attracted to magnets (but not all metals)
- ▶ The field lines have arrows on them. They come out of North and go into South. These field lines are more concentrated at the poles.

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FIFTH SESSION



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Fifth session planning

- ▶ We are going to start with the definition of magnet: a magnet is a material that has the property of attracting the iron, nickel and cobalt. Magnets have different regions. Regions of the same color repel each other. Regions of different color attract each other. The field lines make magnets repel each other or attract each other.
- ▶ Experiments:
- ▶ Acting out how magnets behave each other.
- ▶ Drawing magnetic fields
- ▶ Spoon compasses (Where are they point to??)
- ▶ Orange with a magnet inside. Representation (magnet will always look for the north)
- ▶ Oersted Experiment

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Fifth session material

- ▶ Digital board
- ▶ Pppt
- ▶ Compasses
- ▶ Magnetized needles
- ▶ Batteries
- ▶ Wire
- ▶ Magnets
- ▶ Compasses
- ▶ Notebooks

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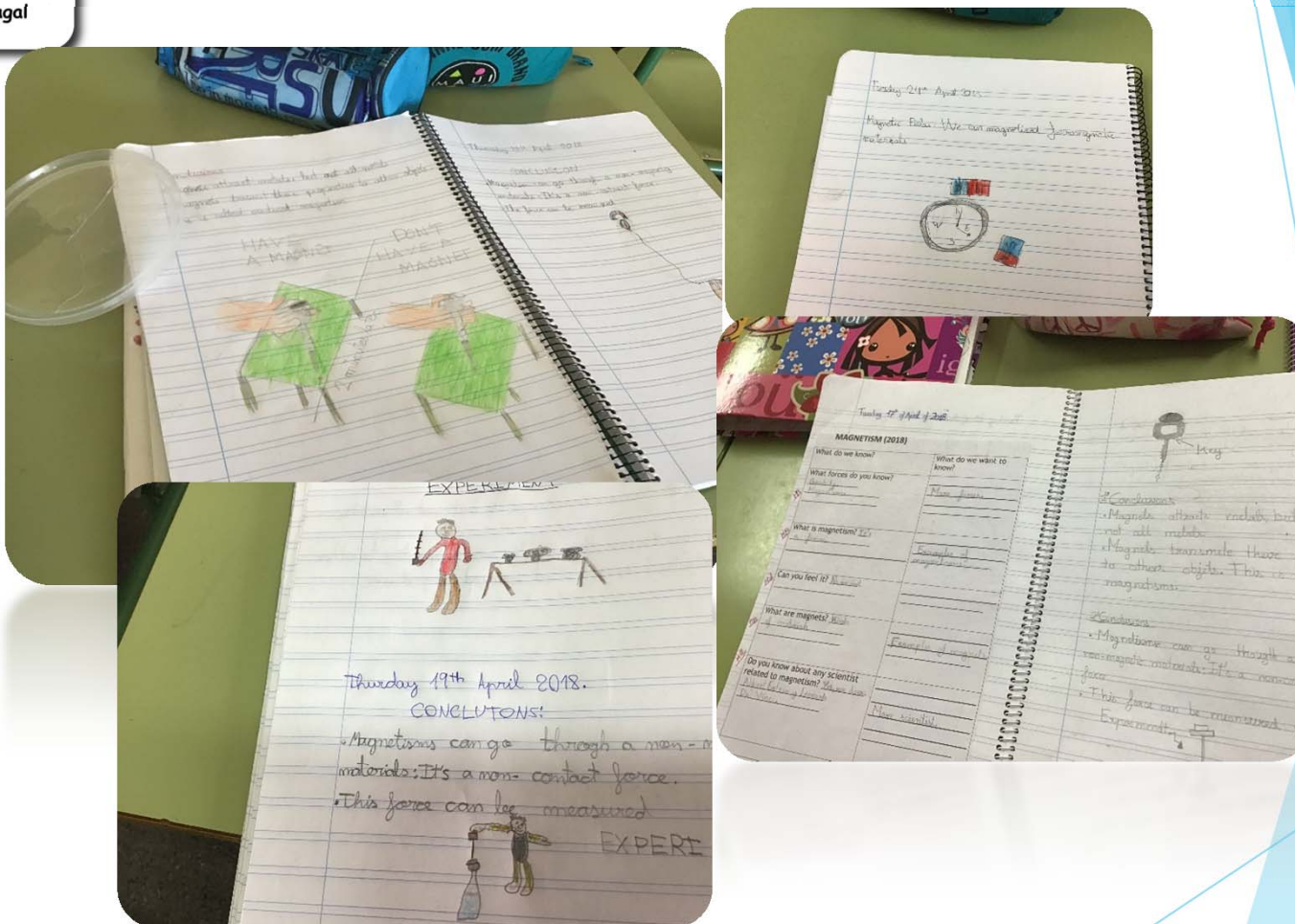
Fifth session conclusions

- ▶ All magnets have two ends or poles (North & South). If you put the poles of two magnets together, they will either pull together or push apart.
- ▶ Laws of magnetism: the equals repel each other, the different attract.
- ▶ Our planet is like a huge magnet
- ▶ Magnetism and Electricity are the two sides of the same coin.

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NOTEBOOKS.....



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MATERIALS



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FINALLY

- ▶ We answer all the questions that we got at the beginning of the project.
- ▶ We will take a test with multiple choice format using Plickers Apps

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THE NATURE OF ELECTRICITY

WHAT FORCES DO YOU KNOW? _____

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