

ACTIVITY DOSE PROJECT '22 –

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Title Activity	Who can retrieve the necklace?
Age	<input checked="" type="checkbox"/> 3 rd grade primary school (10-12 yo) <input type="checkbox"/> 1 st grade High School (12- 14 yo) <input type="checkbox"/> Higher grades (14+ yo)
Estimated duration	120'
learning objectives / competences	(The pupils can ...) <ul style="list-style-type: none"> - Assemble a simple electromagnet themselves. - Optimize their own invention. - Explain why their invention does/doesn't work.
Short description of the activity (max. 4 sentences)	
During playtime, Lies (a girl in a school) lost her necklace. One of the other pupils sees it lying in the water grid. They try to lift the grid, but it is stuck. Who can retrieve the necklace and return it to Lies?	

CONTEXT	
Motivation	The pupils gain insight into the use of an electromagnet. When does an electromagnet work? And when not? The pupils themselves design a suitable solution to retrieve Lies' necklace.
Where is the STE(A)M integration?	S: How does an electromagnet work? Of what elements is it built and what is the function of each element? T: How do we ensure that all components are correctly attached? Can our device reach the necklace? Does it fit between the bars of the grid?

	<p>E: Optimizing the device.</p> <p>(A:) Necklaces, jewelry, design, fashion.</p> <p>M: How much weight can our magnet hold?</p>
Methodology and required materials	
<p>Materials</p>	<p>Per class:</p> <ul style="list-style-type: none"> • • <p>Per group:</p> <ul style="list-style-type: none"> • copper wire • battery • iron rod • chain to pick up from the grid • Dismantling pliers • (only if necessary: to remove the plastic from the copper wire) • Cutting pliers
<p>Organisation</p>	<p>Use of ICT (when relevant):</p> <ul style="list-style-type: none"> • <p>Divide or open classroom (when relevant):</p> <ul style="list-style-type: none"> • During the explanation I would keep the classroom closed, once the groups are working with the electromagnet, the classroom can be opened.
Coaching & methodology	
<p>Based on learning by doing (with different levels: from imitation to creation)</p> <p>Are you paying attention to the research questions you are going to ask? Do you let your pupils investigate on their own?</p>	
<p>Timing: 10' Work format and classroom organisation: Classroom</p> <p>Timing: 40' Method and class organisation: groups</p>	<p>Preface:</p> <p>During playtime, Lies (a girl in a school) lost her necklace. One of the other pupils sees it lying in the water grid. They try to lift the grid, but it is stuck. Who can retrieve the necklace and return it to Lies?</p> <p>Part 1: Investigations, magnetism</p> <p>Brainstorm in the classroom: Possible answer:</p>

<p>Timing: 50' Method and class organisation: classroom and groups</p> <p>Questions:</p> <p>Stimulation of self-management: (concrete opportunities/remarks adapted to the project)</p> <p>Stimulation of cooperation: (concrete opportunities/remarks adapted to the project)</p> <p><input type="checkbox"/> Teamwork:</p> <ul style="list-style-type: none"> ● Groups consist of 3 students. ● Competences needed in a group: <p>o materials master o volume master o director (ensures that everyone is given a chance)</p>	<p>Would it be possible to lift the chain with a magnet? Wouldn't other substances be attached to our magnet? Research: Give each group of students a container with material and a magnet. Let the students guess beforehand: would this material be magnetic? Or not? Then the students test it out.</p> <p>Worksheet: see end of document.</p> <p>Part 2: Electromagnets</p> <p>There are two types of magnets</p> <ul style="list-style-type: none"> - permanent magnets Occur in nature. These magnets always work. - electromagnets You can make your own at home with copper wire, battery, iron bar and something to pick up. With an electromagnet, you create an electrical circuit. The various elements are part of this circuit. By connecting the circuit to a battery, the iron bar becomes magnetic. <p>-> The students get to work with the material themselves and find out how they can create a magnetic circuit using the materials provided.</p> <p>Part 3: constructing an electromagnet</p> <p>Are the different elements connected to each other? Is it a closed circuit?</p> <p>Which material do you think is the problem?</p> <p>What shape should the elements have?</p> <p>Do all elements allow electricity to pass through them?</p> <p>When dismantling copper wire: what do you need to watch out for? (Do not squeeze the dismantling pliers too hard, so that the copper wire is not cut through).</p> <p>Part 4: discussion and reflection:</p> <p>We go through how the electromagnet was made with different groups.</p>
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Timing: moments of 15'

Method and class organisation: individual

Guiding questions:

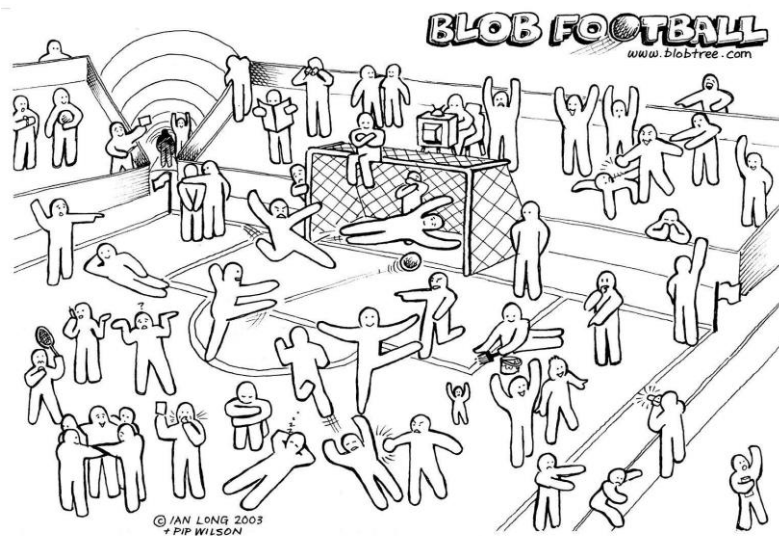
- What did you try first?
- What did you find difficult?
- How did you use the different materials?
- Are there other groups that have also tried this? How did you solve it?

Reflection (on both teamwork and assessment):

Teamwork:

The pupils each colour an avatar..

They colour in a figure that is appropriate to their efforts in this task.



Note: this is an example. To use this picture or drawing, you must buy the original copyrighted work (see below).

- Use of materials. (0-1-2)
- Does the electromagnet work? (0-1-2)
- How were difficulties handled? (0-1-2)
- Independence or help from teacher? (0-1-2)
- How securely were the materials attached to each other? (0-1-2)

□ /10




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Depending on the blob pitch, the student can earn two more points:

Not honestly completed. = 0/2

Completed honestly, but not a good effort. = 0,5 / 2

	<p>Completed honestly, effort was moderate. = 1/2 Filled in correctly, effort was good. = 1.5 / 2 Filled in correctly, very good effort. =2/2</p>
<p>Adaptations:</p> <ul style="list-style-type: none"> For higher grades pupils can further investigate which weight can be lifted and what are the variables to reach that goal? (longer wire? Thicker wire? More electricity?) 	
<p>Tips & tricks (which would you give to another teacher to make that lesson go more smoothly)</p> <ul style="list-style-type: none"> create and test a QR code and web page yourself in advance 	
<p>Tips & Tricks Source: https://www.blobtree.com (copyrighted)</p>	
<p>Contact person: kristof.vandekeere@vives.be / geert.neyrnck@vives.be</p>	

	<p>Material</p>	
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