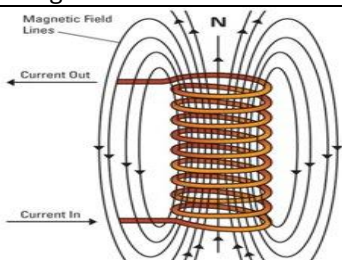


2.	Hands-on physics: Electromagnet
Target group	Pupils
Age	10–12
Duration	1 hour
Objective	Learn how to create an electromagnet and understand how electricity can make a magnet.
Content	 An iron nail and a copper wire is used to create an electromagnet. The magnet is used to lift small metal objects. Students will learn about electromagnetic force, electricity and how it can be used to create an electromagnet.
Materials and Tools Needed	• A large iron nail (about 10 cm long) • Thin insulated copper wire (about 1m) • A fresh AA battery • Small paper clips • Electrical tape (optional) , scissors (to cut the wire, with adult supervision)
Instructions	1. Wrap the Wire Around the Nail Take the copper wire and carefully wrap it around the iron nail. Make sure to wrap it tightly and neatly, leaving about 6 inches of wire free at each end. The more coils you make, the stronger your electromagnet will be. 2. Strip the Wire Ends Ask an adult to help you carefully strip the insulation off the ends of the wire so the metal is exposed. This will help the electricity flow. 3. Connect the Wire to the Battery Attach one end of the wire to the positive (+) end of the AA battery and the other end to the negative (–) end. You can use electrical tape to hold the wires in place. 4. Test Your Electromagnet Now, try to pick up small paper clips or iron filings with the nail. If your electromagnet is working, the nail will attract and hold the paper clips. 5. Turn Off the Electromagnet Disconnect one end of the wire from the battery. The nail will stop being magnetic. What happened? When electricity flows through the wire, it creates a magnetic field around the nail, turning it into a magnet! This is called an electromagnet. When the electricity stops, the nail loses its magnetism.
Think Like an Engineer	• What happens if you add more coils of wire around the nail? • What if you use a bigger battery? • Why do you think the nail only acts like a magnet when the battery is connected?
Bonus Ideas	• Try using different objects instead of the nail. What works best to make an electromagnet? • Have fun experimenting and learning about electromagnets! If you want, draw a picture of your electromagnet and write a few sentences about what you discovered. • Would you like me to help you create a worksheet or a quiz to go along with this assignment?
Evidence	participant count