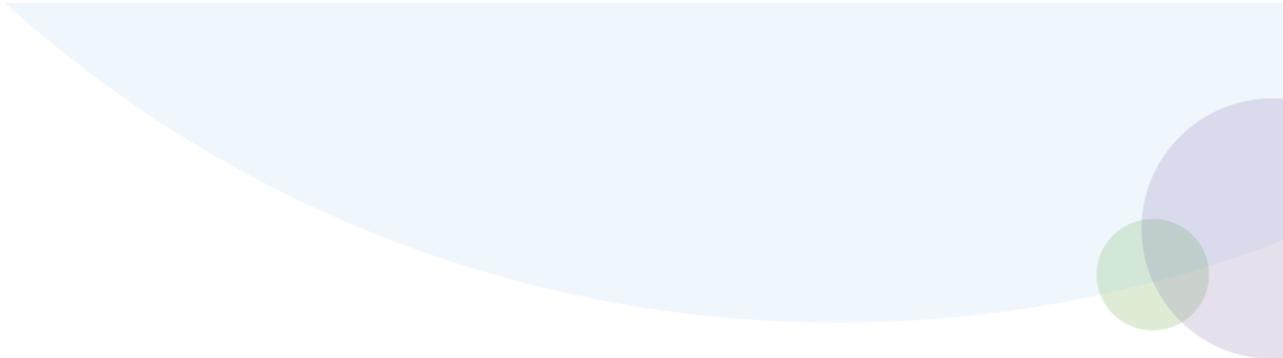


LEARNING RESOURCE

MAGNETIC FIELD PICTURES MAGNETISM RESOURCE 3

MATERIALS

- Variety of coloured A4 paper
- Pencils
- Cooling racks or wire racks from kitchen
- Iron powder (or filings)
- Sieve
- Selections of different (size/shaped/strength) magnets
- Spray Mount
- Laminating Pouches
- Laminator
- Teaspoon
- Latex gloves, aprons and goggles recommended, but not essential
- Decorators face/fume mask



PREP

Probably best to cover tables with newspaper for this activity and either run in a large space, in the classroom just before break, or take small groups aside to participate elsewhere, due to the spray mount. May wish to have a practice with spray mount – if too close to the work, the force of the spray will destroy their results.

Is advisable to have a table to work on and an area where work can dry; away from breezes. Best for adults to move work.

Make sure area is well ventilated and thoroughly aired after use. Recommended that supervising adults use a decorators face mask.

ACTIVITY INSTRUCTIONS

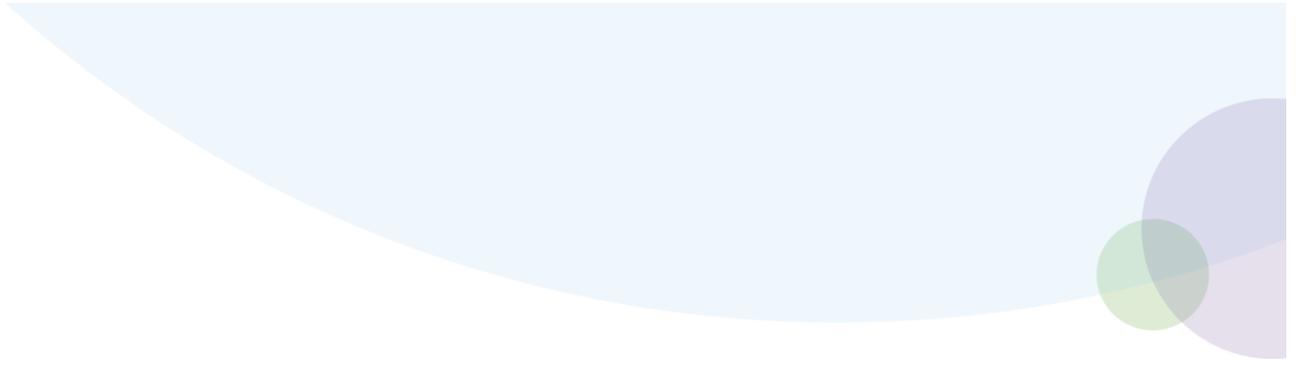
Can allow students to work individually or as pairs. Easy to run as a class experiment.

Each child/pair will require;

- 2 pieces of A4 paper,
 - Pencil,
 - Cooling rack
 - Sieve
 - Teaspoon
 - Iron Powder (or filings)
 - Safety goggles
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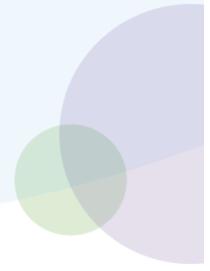


1. Please note all students are required to wear safety goggles when using iron fillings/powder. Iron powder is also classified as flammable.
 2. Allow students to choose either one or several magnets each.
 3. Ask them to place/arrange their magnets, flat, on one of their pieces of paper, then draw around them and, leaving them in place, draw, where they think the magnetic field will be and what shape and area it will cover – this will be their prediction. (Can right or discuss why, if you choose).
 4. Once they have made their predictions they will need to place a cooling rack over it and place their second piece of paper on top of that.
 5. Next they will need to use the sieve and very carefully take a teaspoon of iron powder. They will need to hold the sieve over their paper and gently shake the spoonful of powder into the sieve, as they move it over their paper. Try to make sure the powder is spread evenly over the areas where the magnets have been placed. If needs be use half a spoonful at a time, recommend they gently tap the side of the spoon to distribute powder. The sieve should help to stop too much clumping. NB: They should be warned not to touch their face or mouth until they have washed their hands. Iron itself is not dangerous, it is present in many of our foods (cornflakes etc) but the powder could be irritating and the iron filings could scratch the surface of the eye, if they rub their eyes with dirty hands; if possible provide with goggles, aprons and latex gloves, to avoid irritation.
 6. Once the powder has been distributed across the paper the children should be able to see the patterns of the magnetic fields.
 7. At this point you will need to apply the spray mount to hold the iron powder in place – this is one of the reasons that you do not want too much powder, and you want it to be spread as evenly as possible. Make sure you hold spray at recommended distance (check can for instructions).
 8. Once the spray mount has been applied, allow a couple of minutes to dry before moving.
 9. When dry, laminate to hold in place – the spray mount should hold most of the powder in place, but for prolonged wall displays, is best to laminate.
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10. Once complete the class can look at each other's predictions and results and discuss. Obviously makes for a fantastic wall display!





SUGGESTED EXTENSIONS

- Lots of opportunities to experiment with this one, should you have the time and resources. Do we get the same results with;
 - Different types of magnets?
 - Different types of paper?
 - Card?
 - Does the thickness of the card/paper make any difference to the patterns, even if we do not move the magnets?
 - Iron Filings or Iron Powder?
 - More or less iron (of whatever variety) on the paper? Is it essential to laminate?
 - Can we use hairspray instead of spray mount?
 - Can we mix powders made from different materials in with the iron powder/filings? And will they react in the same way to the magnetic fields? (powder paint, glitter, flour, sugar, sand)
 - Does it matter how close together the magnets are?
 - What happens to the magnetic fields if we stack magnets on top of each other?
 - Can we do this experiment with magnetic materials that are bigger than iron powder/filings? (paperclips for example).
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