Teacher and parent guide

Safe methods and what usually happens · page 1

Sink or float

You need	A tub or washing-up bowl of water, a towel, and things to test: an apple, a coin, a key, a stone, a leaf, a dry sponge, a plastic ball and a metal spoon.
Safety	Stay with young children the whole time there is water out, and empty the tub as soon as you finish.
	Wipe up splashes straight away so nobody slips.
Usually	Usually float: the apple, the leaf, the plastic ball and the dry sponge (it may sink once it soaks up water).
	Usually sink: the coin, the key, the stone and the metal spoon.
	A ball of modelling clay sinks; flatten the same clay into a boat and it floats.
The science	Whether a thing floats depends on how much matter is packed into its size compared with water (its density), not just on how heavy or big it is.

Magnets

You need	A large magnet (a bar, horseshoe or wand magnet), steel paper clips, a few sheets of paper, and things to test: coins, a key, a metal spoon, a pencil, an eraser, a sock and a food tin.
Safety	Use large classroom magnets only. Never use small loose magnets, magnetic beads or toys with magnets that can come out: they are very dangerous if swallowed.
	Keep magnets away from bank cards and tablets.
Usually	Always attracted: steel paper clips and a steel food tin.
	Never attracted: the pencil, the eraser, the sock and paper.
	It depends: coins, keys and spoons. Many keys are brass and stainless steel spoons vary, so the test is the only way to know. UK 5p and 10p coins made since 2012 stick; older ones do not.
The science	Magnets attract iron, nickel, cobalt and metals that contain them, such as steel. Most other metals, like aluminium and copper, and materials like plastic, wood and fabric, are not magnetic.

Plant growth diary

You need	Runner or broad bean seeds from a seed packet, a clear cup or small pot, potting mix or damp paper towel, water and a ruler.
Safety	Use seeds sold for planting and tell children never to eat seeds or beans from the experiment.
	Open potting mix away from faces, keep it damp, and everyone washes their hands after touching it.
Usually	First a root grows down, then a shoot grows up; somewhere warm, it happens faster.
	A bean kept in a dark cupboard can still sprout, but its shoot grows tall, thin and pale; one on a sunny windowsill stays green and sturdy.
The science	A seed needs water, warmth, air and time to sprout. Once it has leaves, a plant needs light to make its food.

Sources for every fact: colouringnest.com/science-experiment-worksheets/ (BBC Bitesize, Science Learning Hub, Met Office).

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Weather observation

You need	A window or a safe spot outside, a thermometer (digital or a red spirit one), a clear plastic bottle cut down as a rain gauge, a ruler and a ribbon or windsock.
Safety	Never look straight at the sun.
	Grown-ups cut the bottle for the rain gauge and tape the cut edge. Observe from indoors when there is thunder or lightning.
Usually	Temperatures read in the sun are higher than in the shade, which is why weather stations measure in the shade.
	A ribbon blowing towards the east means a west wind: wind is named after the direction it comes from.
The science	Weather stations measure air temperature in the shade, about 1.25 m above the ground, and collect rain in a gauge set in the open.

Materials sort

You need	Everyday objects or scraps of wood, metal (kitchen foil), plastic, fabric, paper and card, a jug of water and a magnet.
Safety	Leave out glass, sharp edges and anything with batteries. Fold the edges of foil scraps.
	Do the water test on a tray.
Usually	Fabric, paper and card soak up water; plastic, metal foil and wood (for a short test) do not.
	Paper, foil and fabric bend easily; wood does not. Only clear plastic is see-through.
	Kitchen foil is aluminium, so a magnet does not pick it up.
The science	An object is the thing; a material is what it is made from. Materials have properties, such as being waterproof, bendy or magnetic, that make them right for a job.

Fair test

You need	Whatever the question needs. A good first test: a toy car, a ramp made from a board and books, a tape measure, and different floor surfaces.
Safety	Keep ramps low and walkways clear.
	Run each test three times and keep everything the same except the one thing you change.
Usually	The car usually rolls furthest on the smoothest surface and least far on carpet or a towel.
	Repeat results rarely match exactly, so children compare them and work out a typical result.
The science	In a fair test you change one thing, keep everything else the same and measure one thing, so you know what caused the difference.

Sources for every fact: colouringnest.com/science-experiment-worksheets/ (BBC Bitesize, Science Learning Hub, Met Office).