Owls – Year 4/5
Autumn 1 (A)

Science – Properties & Changes of Materials
How were materials used in Ancient Egypt? Thread: Chemistry

What I should already know: I know the difference between an object and the material from which it is made. I can identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock and describe their physical properties. I can compare and group together a variety of everyday materials on the basis of their physical properties. I can identify and compare the suitability of a variety of everyday materials for particular uses. I know how the shapes of solid objects can be changed by squashing, bending, twisting and stretching.

Enquiry Questions

- Can we group materials according to their properties?
- Which materials are soluble in water?
- How can mixtures be separated?
- Can we recognise and describe reversible changes?
- How do we know new materials have been made after a chemical reaction?
- Which materials would the Ancient Egyptians have used and how would these have been fit for purpose?

Key Vocabulary

Burning – Causing to be in flames or on fire.
Change of state – The process of changing solid into gas or liquid, and vice versa.
Chemical change – A type of change in which a new substance is formed.
Condensation – The act or process of changing from a gas to a liquid.
Conductor – Anything that carries or allows passage of heat, electricity or sound.
Degrees celsius – The units commonly used for measuring temperature.
Dissolve – To mix with a liquid and become part of the liquid.
Durable – The ability to last a long time without being damaged.
Effervescence – Fizzing or bubbling.
Electrical insulator – A material through which electrical current can't flow freely.
Evaporation – The process where a liquid turns into a gas.
Filter – To separate solid particles in a mixture by passing the mixture through a screen.
Insoluble – A substance that cannot be dissolved in liquid.
Irreversible changes – Changes to substances that cannot be undone or reversed.
Magnetic – A material that is attracted to a magnet.
Melting – Changing from solid to liquid.
Mixture – Different things combined together. The particles are not bonded to each other.
Physical change – A change that can be reversed such as changing state or making a solution.
Product – New substances made after the chemical change has happened.
Pure substance – A substance that has no other substances mixed into it.

Working Scientifically Skills

Pupils will:

- Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets.
- Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.
- Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.
- Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.
- Demonstrate that dissolving, mixing and changes of state are reversible changes.
- Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.

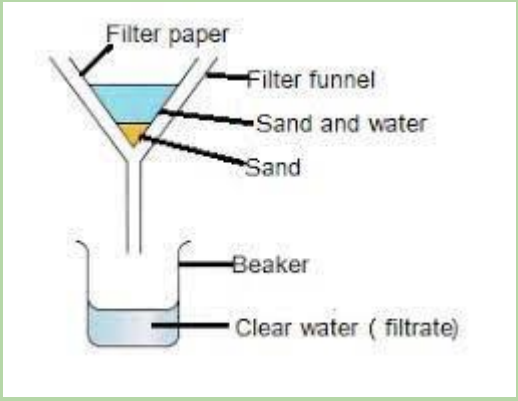
Working Scientifically (Blue = Y5)

- Ask relevant questions and use different types of scientific enquiries to answer them. / Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.

	Reversible changes – Changes to substances that can be undone or reversed. **Rusting –** The reaction of iron with oxygen. **Sieve –** To separate a mixture using a tool with small holes; used to separate smaller particles from larger ones. **Soluble –** A word used to describe materials that dissolve in liquid. **Solute –** A substance that can be dissolved in liquid. **Solution –** A mixture that contains two or more different substances combined evenly. **Solvent –** A substance that can dissolve a solute. Water is a solvent. **Thermal insulator –** A material which does not conduct heat very well and so can be used to control heat and keep things hot or cold. **Transparent –** A material that allows light to pass through it so it can be seen through clearly. **Versatile –** Is able to do many different things or used in many different ways. **Water cycle –** The continuous journey of water from oceans and lakes, to clouds, to rain, to streams, to rivers and back into the ocean again.	• Use straightforward scientific evidence to answer questions or to support them. / Identify scientific evidence that has been used to support or refute ideas or arguments. • Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment. / Take measurements using a range of scientific equipment with increasing accuracy and precision, taking repeat readings where necessary. • Identify differences, similarities or changes related to simple scientific ideas and processes. • Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. / Use test results to make predictions to set up further comparative and fair tests. • Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables. • Gather, record, classify and present data in a variety of ways to help answer questions. • Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. / Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.

Useful images

Dissolving



Filtering

Sieving

Using a magnet to separate iron filings from sand.

Rusting is the result of a chemical reaction between iron and oxygen.

Links to other curriculum areas: Geography – The water cycle; History – Ancient Egypt