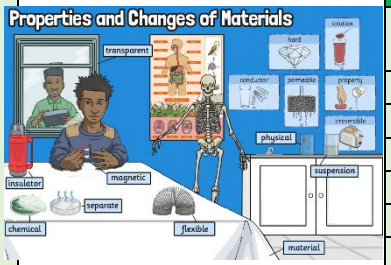
Science: Properties and changes of materials
YEAR 5 Autumn 1

National Curriculum subject content

- ✓ 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.

National Curriculum working scientifically

- ✓ planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- ✓ taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- ✓ recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- ✓ using test results to make predictions to set up further comparative and fair tests
- ✓ reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations
- ✓ identifying scientific evidence that has been used to support or refute ideas or arguments



Key Vocabulary:

circuit	A complete and closed path around which an electrical current can flow.
conductor	A material that transmits heat or electricity
dissolve	To incorporate into a liquid to become a solution
flexible	Capable of bending without breaking
heat	The quality of being hot; high temperature
hard	Solid, firm, rigid, not easily broken
insulator	A substance which does not readily allow the passage of heat, sound or electricity.
irreversible	Not able to be undone or altered.
liquid	A substance that flows freely but is of constant volume
magnetic	Material that has the ability to physically attract other substances
material	The matter from which a thing is or can be made
permeable	Allowing liquids or gases to pass through it.
property	The qualities and characteristics of a substance that describe and identify it
soluble	Able to be dissolved, especially in water.
solid	Firm and stable in shape; not liquid or gas
thermal	The energy in a substance responsible for its temperature
transparent	Allowing light to pass through
reversible	Chemical change where no new materials are created and the original material can be recovered
variable	Is a factor that can be changed in an experiment

Sequence of Learning:

Objectives (key knowledge):

Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6
To learn how to compare and group together everyday materials on the basis of their properties.	To learn how to investigate thermal conductors and insulators.	To learn how to investigate which electrical conductors make a bulb shine brightest.	To learn how to investigate materials which will dissolve	To learn how to use different processes to separate mixtures of materials.	To learn how to identify and explain irreversible chemical changes.

Sticky Knowledge about materials

The material with the highest known melting point is a metal called tungsten, which melts at 3887 degrees Celsius.
The most electrically conductive material is silver. It is also the best thermal conductor and reflector of light.
Not all metals are magnetic.
Chemical changes produce new materials. They also usually give out or take in energy such as light or heat.
Burning is an irreversible change.
Rust happens when iron, oxygen and water mix together. this is called oxidation. It occurs because the chemical reaction creates a new substance called iron oxide.