Lowerhouse Junior School
Science Overview Sheet

Year 5 – Materials and their Properties – Autumn 1



Rationale: Teaching materials and their properties in Year 5 science is essential for developing students' understanding of the physical world. It fosters critical thinking, problem-solving skills, and scientific literacy. By exploring different materials, students learn about their uses, benefits, and limitations, which is fundamental for future scientific learning and everyday decision-making.

Substantive Knowledge:

- 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.

Disciplinary Knowledge:

- Classifying
- Observing over time
- Comparative/Fair testing

Overview:

Lesson 1: To sort materials according to their properties
Lesson 2: To compare materials based on their thermal properties
Lesson 3: To investigate electrical conductors and insulators
Lesson 4: To test the absorbency of materials
Lesson 5: To report and present findings from my own enquiry.

Key Vocabulary:

Thermal insulator: A material that resists the flow of heat, keeping heat from passing through it easily.
Thermal conductor: A material that allows heat to pass through it easily.
Change of state: The transformation of a substance from one physical state (solid, liquid, gas) to another, such as melting, freezing, condensation, or evaporation.
Mixture: A combination of two or more substances where each substance retains its own chemical identity and properties.
Dissolve: The process by which a solute becomes incorporated into a solvent to form a solution, often resulting in the solute becoming invisible.
Solution: A homogeneous mixture composed of two or more substances, where the solute is uniformly distributed within the solvent.
Soluble: A substance that can be dissolved in a particular solvent.
Insoluble: A substance that cannot be dissolved in a particular solvent.
Filter: A method or device used to separate solid particles from a liquid or gas by passing the mixture through a medium that traps the solid particles.
Sieve: A tool with a mesh or perforated bottom used to separate coarse particles from finer particles or liquids.
Reversible change: A change that can be undone, returning the substance to its original state, such as melting and freezing.
Non-reversible change: A change that cannot be undone, resulting in the formation of new substances, such as burning or rusting.

	Burning: A chemical reaction between a substance and oxygen that produces heat, light, and new substances, typically involving combustion. **Rusting**: A chemical reaction between iron, oxygen, and moisture that results in the formation of iron oxide, commonly known as rust. **New material:** A substance that is created through a chemical reaction or process, resulting in a material with different properties from the original substances.

Impact/Assessment

Most Children will be able to: • use understanding of properties to explain everyday uses of materials, for example, how bricks, wood, glass and metals are used in buildings • explain what dissolving means, giving examples • name equipment used for filtering and sieving • use knowledge of liquids, gases and solids to suggest how materials can be recovered from solutions or mixtures by evaporation, filtering or sieving • describe some simple reversible and non-reversible Key vocabulary changes to materials, giving examples