St James' Church of England Primary School
Science Overview Sheet

Year 5 – Properties and changes

Rationale: Pupils should build a more systematic understanding of materials by exploring and comparing the properties of a broad range of materials and relating these to what they learnt about magnetism in Year 3 and about electricity in Year 4. **Note:** Pupils are not required to make quantitative measurements about conductivity and insulation at this stage. It is sufficient for them to observe that some conductors will produce a brighter bulb in a circuit than others and that some materials will feel hotter than others when a heat source is placed against them.

Pre-unit task: Knowledge Organiser Quizzes

Working Scientifically:

- Carry out tests to answer questions such as 'Which materials would be the most effective for making a warm jacket, for wrapping ice cream to stop it melting, or for making blackout curtains?'
- Compare materials in order to make a switch in a circuit.

Statutory Requirements:

- 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
- Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic
- Compare a variety of materials and measure their effectiveness (e.g. hardness, strength, flexibility, solubility, transparency, thermal conductivity, electrical conductivity)

Temperature and Thermal Insulation

- Heat always moves from hot to cold.
- Some materials (insulators) are better at slowing down the movement of heat than others.
- Objects/liquids will warm up or cool down until they reach the temperature of their surroundings.

Overview:

Lesson 1: Properties of Materials - I can compare materials according to their properties
Lesson 2: Keeping Cool- I can investigate thermal conductors and insulators
Lesson 3: Brighter Bulbs – I can investigate which electrical conductors make a bulb shine brightest
Lesson 4: Disappearing or Dissolving – I can investigate materials which will dissolve
Lesson 5: Separating Mixtures – I can use different processes to separate mixtures of materials
Lesson 6: Irreversible Changes – I can identify and explain irreversible chemical changes

Cross Curricular Links

Resources

• 5 or 6 feely bags filled with different materials, placed around the room.• Different materials for children to test;• Magnets; • Small metal nails; • Goggles; • Jars or beakers, empty trays, measuring jugs;• Elastic bands; • Play sand;• Water; • Raisins, flour, rice, table salt; • Paper clips; • Either: A pan and a heat source to boil water in the pan or: Containers and a safe place to leave them when filled with water; • Magnets; • Funnels, filter paper; • Sieve;• Bowls. • Warm milk (approximately 40°C, and not hotter than 45°C)- store it in a thermos flask for ease of use; • White (distilled) vinegar; • Mixing bowls or beakers; • Tablespoons;• Bicarbonate of soda;• Cardboard; • Balloons;• Plastic bottles;

Assessment

Most Children will: • Follow instructions to test a material's properties. • Explain the uses of thermal and electrical conductors and insulators. • Order materials according to their electrical conductivity. • Explain and investigate dissolving. • Explain the processes used to separate mixtures. • Explain irreversible changes. • Identify the variables in an investigation. • Make observations and conclusions

Less Able Children will: • Identify materials. • Describe materials' properties. • Identify thermal and electrical conductors and insulators. • Identify materials that are soluble or insoluble in water. • Follow instructions to separate mixtures. • Identify irreversible changes

More Able Children will: • Devise their own ways to test a material's properties. • Explain the uses of a material according to its properties. • Explain why materials have dissolved in certain conditions. • Select and explain the most suitable processes to separate different mixtures. • Identify the new materials made in irreversible changes. • Identify dependent, independent and controlled variables.