|  |  |
| --- | --- |
| **Topic** | **Groovy Greeks and Invaders and Settlers** |
| **Science Unit** | Properties and Changes of Materials |
| **Curriculum Objectives** | **Content:** **Properties of Materials*** 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.

**Changes of Materials** * Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.
* Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.
* 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:** **Properties of Materials*** Begin to choose the most appropriate equipment from a range of scientific equipment, including newton meters, filter paper, funnels, scales. (L5)
* Begin to take measurements with increasing accuracy and precision, taking repeat readings when appropriate. (L5)
* Begin to decide on the best unit of measure to record data in. (L5)
* Report and present findings from enquiries, including conclusions, causal relationships, in oral and written forms such as displays and other presentations. (L6)
* Begin to use test results to make a prediction to set up a further comparative or fair test. (L6)
* Compare their results with others and comment on how reliable they are. (L6)

**Changes of Materials*** Identify patterns in their data/charts and begin to look for casual relationships in data. (L4) (Can skip if doing in animals including humans)
* Begin to spot unexpected results which don’t fit the pattern. (L4)
* Explain why something happened, identifying casual relationships and using relevant scientific language from year 5. (L4)
* Report and present findings from enquiries, including conclusions, causal relationships, in oral and written forms such as displays and other presentations. (L4)
* Begin to plan different types of scientific enquiries to answer questions: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations, including recognising and controlling variables); and researching using secondary sources.
 |
| **Lesson Objectives** | Autumn Week 1 | Autumn Week 2 | Autumn Week 3 | Autumn Week 4 | Autumn Week 5 | Autumn Week 6 |
| To learn to classify materials.  | To learn to describe properties of materials. | To learn to compare and classify materials. | To learn to explore theconductivity of materials.  | To learn to carry out an investigation.  | To learn to present findings. |
| Summer Week 1 | Week 2 | Week 3 | Week 4 | Week 5 | Week 6 |
| To learn to decide how to separate mixtures. | To learn how to create a solution.  | To learn to carry out an investigation. (reversible changes) | To learn to present findings. | To learn to that some changes are irreversible. | To learn about the effects of chemical changes. |
| **Key Vocabulary** | **thermal conductor** | **electrical conductor** | **soluble** | **insoluble** | **reversible change** | **irreversible change**  |
| **mixture** | **solution** | **solvent**  | **solute** | **saturated** | **dissolve** |
| **separate** | **filter** | **sieve** | **evaporation** | **chemical change** | **physical change** |
| **permanent** | **burning** | **rusting** | **bond** | **reaction** | **molecule** |
| **Use previous years vocabulary for descriptions of properties of materials** |
| **Possible lesson ideas** | **Properties of Materials*** Lesson 1: Pre-assessment activity. Children classify and group materials in their own way – using Carrol Diagram.
* Lesson 2: <https://developingexperts.com/s/missions/223>
* Lesson 3: Introduce new vocabulary for properties and then compare and classify materials now **focused on hardness, transparency and response to magnets.** Look at materials around you, what are they made of? Do they feel the same? Would they break? <https://developingexperts.com/s/missions/224>
* Lesson 4: Focus on conductivity (thermal and electrical)
* Lesson: 5-6: Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. Which material would be the strongest to build a bridge? Which material is the most magnetic? What is the most absorbent paper towel? Introduce the investigation to the pupil by discussing the use of paper towels and kitchen paper for mopping up spills. Discuss which properties of paper they will be looking for and how to make the test fair e.g. using the same sized piece of paper/towel and using the same amount of water each time.

**Changes of Materials** * Lesson 1: Discuss what a mixture is. Have a range of examples of mixtures and different equipment and let pupils explore the best way to separate them using filters and sieves. <https://www.stem.org.uk/resources/elibrary/resource/33464/separating-mixtures> <https://www.stem.org.uk/resources/elibrary/resource/26918/second-look-science-sports> Look at Hamilton Trust Changing Materials lesson 1
* Lesson 2: <https://developingexperts.com/s/missions/226>
* Lesson 3-4: Investigations linked to solutions and solubility: Use evaporation to separate solutions.

Does salt/sugar dissolve quicker at a higher temperature/if stirred? Which type of sugar dissolves the quickest? Will sugar dissolve at a different speed in different liquids? * Lesson 5: Bake something as a class and see how the change is irreversible. Look at Hamilton Trust Changing Materials lesson 3 or Developing Experts lesson <https://developingexperts.com/s/missions/227>
* Lesson 6: <https://developingexperts.com/s/missions/228>
* Whole unit topic: Covers Lesson 1 and 5-6 objective. <https://www.hamilton-trust.org.uk/science/year-5-science/properties-materials-music-festival-materials/>
* Whole unit topic: Covers Lessons 2-4 objectives <https://www.hamilton-trust.org.uk/science/year-5-science/changes-materials-changing-materials-education-pack/>
* Whole unit topic: Lesson 1 and 5-6 <https://developingexperts.com/s/unit-library/units/31>
* Whole unit topic: Useful for Lesson 2-4 <https://developingexperts.com/s/unit-library/units/32>
* <https://www.stem.org.uk/resources/community/collection/12742/year-5-properties-materials>
 |