



## Knowledge & Understanding

## Working Scientifically

## Vocabulary

## Scientist

# MATERIALS

<b>EYFS</b>	<p><b>I will be able to:</b>  <i>ELG 14:</i> Know that objects and materials have similarities and differences.</p> <p><i>ELG 14:</i> Talk about the materials that I can see and use around me.</p> <p><i>ELG 14:</i> Talk about how and why some materials change.</p> <p><i>ELG 16:</i> Use and explore a variety of materials, talking about colour, design, texture, form and function.</p>	<p><b>I will have the opportunity to:</b>            Observe how materials are used in school and at home.</p> <p>Observe how materials might change.</p> <p>Make predictions about what changes might happen and test my ideas.</p> <p>Develop ideas of cause and effect.</p> <p>Sort and group materials based upon similarities and differences.</p> <p>Plan and make decisions about how to approach a task and review how well the approach worked.</p>																																
<b>Year 1</b>	<p><b>I will be able to:</b>            Know the difference between an object and the material that it is made from.</p> <p>Know and name a variety of everyday materials including wood, plastic, glass, metal water and rock.</p> <p>Identify a range of natural and man-made materials that are used to make everyday objects.</p> <p>Recognise that a material, used to make everyday objects, is chosen because of its properties.</p> <p>Use a range of vocabulary to describe some simple, physical properties of everyday materials.</p>	<p><b>I will have the opportunity to:</b>            Classify objects made from one material in different ways.</p> <p>Classify, sort and group objects made from different materials in different ways.</p> <p>Ask questions about properties of materials (e.g. Which cloth is the most absorbent?) and plan/carry out an enquiry to answer this question.</p> <p>Gather and record data to answer my own enquiry questions.</p> <p>Perform simple tests to explore which material is best suited for a particular function.</p>	<table border="0"> <tr> <td><i>material</i></td> <td><i>see through</i></td> </tr> <tr> <td><i>properties</i></td> <td><i>not see through</i></td> </tr> <tr> <td><i>hard</i></td> <td><i>glass</i></td> </tr> <tr> <td><i>soft</i></td> <td><i>wood</i></td> </tr> <tr> <td><i>stretchy</i></td> <td><i>brick</i></td> </tr> <tr> <td><i>elastic</i></td> <td><i>foil</i></td> </tr> <tr> <td><i>stiff</i></td> <td><i>fabric</i></td> </tr> <tr> <td><i>shiny</i></td> <td><i>wool</i></td> </tr> <tr> <td><i>dull</i></td> <td><i>metal</i></td> </tr> <tr> <td><i>rough</i></td> <td><i>man-made</i></td> </tr> <tr> <td><i>smooth</i></td> <td><i>natural</i></td> </tr> <tr> <td><i>bendy</i></td> <td></td> </tr> <tr> <td><i>not bendy</i></td> <td></td> </tr> <tr> <td><i>flexible</i></td> <td></td> </tr> <tr> <td><i>waterproof</i></td> <td></td> </tr> </table>	<i>material</i>	<i>see through</i>	<i>properties</i>	<i>not see through</i>	<i>hard</i>	<i>glass</i>	<i>soft</i>	<i>wood</i>	<i>stretchy</i>	<i>brick</i>	<i>elastic</i>	<i>foil</i>	<i>stiff</i>	<i>fabric</i>	<i>shiny</i>	<i>wool</i>	<i>dull</i>	<i>metal</i>	<i>rough</i>	<i>man-made</i>	<i>smooth</i>	<i>natural</i>	<i>bendy</i>		<i>not bendy</i>		<i>flexible</i>		<i>waterproof</i>		<p>Charles Mackintosh</p> <p>John Macadam</p>
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<b>Year 2</b>	<p><b>I will be able to:</b>            Explain the properties of materials which make them suitable for a purpose.</p> <p>Explore if a wide range of materials can be suited to the same purpose.</p> <p>Understand that the shapes of some solid objects can be changed by physical force.</p> <p>Describe how the shape of some solid object changes when pressure is applied in different ways.</p>	<p><b>I will have the opportunity to:</b>            Observe and record how different materials are used around school.</p> <p>Sort and group materials in different ways using my knowledge of their properties and functions.</p> <p>Test the properties of materials for particular uses through practical enquiries and use my findings to answer questions.</p> <p>Choose appropriate methods of testing materials for a particular property.</p> <p>Compare the uses of every day materials in and around school with materials found in other places (e.g. home / the park)</p> <p>Research a scientist who developed a new material and explain why it is useful.</p>	<table border="0"> <tr> <td><i>change</i></td> <td><i>strong</i></td> </tr> <tr> <td><i>bake</i></td> <td><i>weak</i></td> </tr> <tr> <td><i>bend</i></td> <td><i>transparent</i></td> </tr> <tr> <td><i>twist</i></td> <td><i>opaque</i></td> </tr> <tr> <td><i>stretch</i></td> <td><i>absorbent</i></td> </tr> <tr> <td><i>squash</i></td> <td><i>not absorbent</i></td> </tr> <tr> <td><i>heat</i></td> <td><i>manufactured</i></td> </tr> <tr> <td><i>cool</i></td> <td></td> </tr> <tr> <td><i>freeze</i></td> <td></td> </tr> <tr> <td><i>paper</i></td> <td></td> </tr> <tr> <td><i>glass</i></td> <td></td> </tr> <tr> <td><i>clay</i></td> <td></td> </tr> <tr> <td><i>rock</i></td> <td></td> </tr> <tr> <td><i>sand</i></td> <td></td> </tr> <tr> <td><i>cardboard</i></td> <td></td> </tr> </table>	<i>change</i>	<i>strong</i>	<i>bake</i>	<i>weak</i>	<i>bend</i>	<i>transparent</i>	<i>twist</i>	<i>opaque</i>	<i>stretch</i>	<i>absorbent</i>	<i>squash</i>	<i>not absorbent</i>	<i>heat</i>	<i>manufactured</i>	<i>cool</i>		<i>freeze</i>		<i>paper</i>		<i>glass</i>		<i>clay</i>		<i>rock</i>		<i>sand</i>		<i>cardboard</i>		<p>John Dunlop</p> <p>William Addis</p>
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## MATERIALS (States of Matter)

Year 4

**I will be able to:**  
 Define whether a material is a solid, liquid or a gas and use scientific vocabulary and ideas to justify my reasoning.

Explain how some materials change state if they are heated or cooled.

Explain the different temperatures at which water changes state.

Describe the process of evaporation and condensation and give examples of where I might see this in real-life.

Describe how evaporation and condensation occur within the water cycle.

**I will have the opportunity to:**  
 Observe, group and classify a range of solids, liquids and gases.

Measure the temperature, when cooling or heating, using a thermometer and record using °C.

Observe a material changing state over time and pose my own enquiry answers that I will try to find the answer to.

Predict what variables affect the speed of melting and evaporation.

Use gathered data, from my own investigation, to draw simple conclusions.

Draw accurate particle diagrams to show the process of water changing states.

Present my understanding of the water cycle in different ways.

*matter*  
*solid*  
*liquid*  
*gas*  
*state*  
*vapour*  
*expand*  
*contract*  
*particle*  
*thermometer*  
*temperature*  
*degrees*  
*Celsius*  
*heating*  
*cooling*  
*boiling*  
*freezing*  
*melting*  
*dissolve*

*energy*  
*changing*  
*state*  
*Water cycle*  
*evaporation*  
*condensation*  
*evaporate*  
*condense*  
*variable*  
*rate*

Anders Celsius

Daniel Farenheit

Year 5

**I will be able to:**  
 Identify materials which are soluble in liquids and describe this process as dissolving.

Explain how materials, which have dissolved in a solution, can be recovered.

Use my knowledge of the properties of these materials to select an appropriate method to separate materials from mixtures, solutions and suspensions.

Describe different uses for common everyday materials based on their properties.

Explain the differences between reversible and irreversible changes, giving examples of both.

Understand that some irreversible changes can result in the formation of new materials and give some real-life examples of irreversible changes we can see around us.

Research and describe some materials which have been manufactured by irreversible change and explain how the properties of the new materials make them useful in our everyday lives.

Use my knowledge of the properties of materials and explain why some materials are not suitable for particular uses.

**I will have the opportunity to:**  
 Use charts and tables to group and compare everyday materials by their properties.

Plan and carry out my own tests to investigate the properties of different materials.

Use gathered data and results to recommend, in a conclusion, materials for particular functions depending on their properties.

Explore adding a range of solids to water and other liquids, and present my observations using key vocabulary.

Use my observations to pose my own questions.

Choose appropriate methods and equipment to separate mixtures by sieving, filtering and evaporation and review the effectiveness of each method to suggest improvements.

Plan and carry out comparative and fair tests to explore irreversible changes I might see in my everyday life.

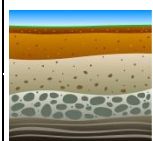
Research new materials produced by chemists.

*freezing*  
*melting*  
*boiling*  
*solid*  
*liquid*  
*gas*  
*properties*  
*solute*  
*soluble*  
*solution*  
*mixture*  
*suspension*  
*sieve*  
*filter*  
*evaporate*  
*condense*  
*decant*  
*saturate*  
*temperature*  
*state*  
*Celsius*  
*chemical*

*reaction*  
*reversible*  
*irreversible*  
*reactant*  
*product*  
*conductivity*  
*brittle*  
*thermal*  
*flexible*  
*waterproof*  
*permeable*  
*impermeable*  
*synthetic*  
*natural*  
*absorbent*  
*rigid*  
*hard*  
*conductor*  
*insulator*  
*transparent*  
*translucent*  
*magnetic*

Spencer Silver

Ruth Benerito



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## ROCKS

Year 3

**I will be able to:**

- Name different types of rock and explain the physical features of each.
- Describe the structure of the Earth and where the different types of rocks may be found.
- Explain how igneous, metamorphic and sedimentary rocks are formed.
- Explain the rock cycle using simple scientific vocabulary.
- Use my knowledge of rock formation to explain how fossils, are made.
- Describe how soils are formed and explain why they include organic matter and inorganic materials.

**I will have the opportunity to:**

- Compare and group together different kinds of rocks and explain my reasoning linking to colour, hardness, grain or crystal composition.
- Observe different types of rocks in and around the local area and the purpose for which they have been used.
- Ask questions about why rocks might have changed over time.
- Ask and answer questions about why soils are formed.
- Devise my own tests to investigate the properties of rocks.
- Present my ideas in various ways to show my understanding of how rocks are formed (*using diagrams, role play, animation, report etc.*)
- Observe how soil can be separated through sedimentation.

- |                    |                       |
|--------------------|-----------------------|
| <i>rock</i>        | <i>impervious</i>     |
| <i>soil</i>        | <i>molten</i>         |
| <i>appearance</i>  | <i>lava</i>           |
| <i>grain</i>       | <i>fossil</i>         |
| <i>crystal</i>     | <i>texture</i>        |
| <i>porous</i>      | <i>sand</i>           |
| <i>sedimentary</i> | <i>gravel</i>         |
| <i>metamorphic</i> | <i>clay</i>           |
| <i>igneous</i>     | <i>Moh's scale</i>    |
| <i>rock cycle</i>  | <i>sandstone</i>      |
| <i>bedrock</i>     | <i>granite</i>        |
| <i>weathering</i>  | <i>marble</i>         |
| <i>erosion</i>     | <i>limestone</i>      |
| <i>organic</i>     | <i>flint</i>          |
| <i>peat</i>        | <i>slate</i>          |
| <i>humus</i>       | <i>chalk</i>          |
| <i>loam</i>        | <i>characteristic</i> |
| <i>absorbent</i>   | <i>volcano</i>        |
|                    | <i>organic</i>        |
|                    | <i>inorganic</i>      |

Mary Anning  
Inge Lehmann

