

## Year 1

### Materials

#### Background information

There are excellent ideas to teach materials in "A creative approach to teaching science" by Nicky Waller. These include guessing games such as "What's in the box?" or "Twenty questions" using the objects properties and how to organise a material hunt. When teaching this unit ensure you have examples of objects that are made from more than one material e.g. a plastic, wooden and metal spoon so the children don't identify an object as being made of one particular material (e.g. wooden, plastic and metal spoons). Also include objects made of more than one material e.g. scissors (plastic and metal) to add an additional challenge to sorting activities. It would be lovely to make a table of different materials where children can add to the collection from home. "Feely" books as suggested in the Nicky Waller book will help you build up a range of descriptive vocabulary. The investigations of materials properties are best placed into a context either real life or from a story e.g. Can we make teddy a waterproof umbrella? Can we build a strong bridge for the three billy goats gruff or a strong house for the three pigs to live in? Can we make a lining for a dog's basket? **Avoid the properties of absorbency/ shock proofing/stretchy/ transparency as these may be investigated in year 2.**

All objects are made of one or more materials. Some objects can be made from different materials e.g. plastic, metal or wooden spoons.

Materials can be described by their properties e.g. shiny, stretchy, rough etc. Some materials e.g. plastic can be found in very different forms with very different properties.

#### Common misconceptions:

See explorify <https://explorify.uk/teaching-support/teaching-science/materials-tackle-the-tricky-bits>

- Only fabrics are materials.
- The word "rock" describes an object rather than a material.
- "solid" is another word for hard.

#### What children should already know / Be able to do

From EYFS:

Children know about similarities and differences in relation to places, objects, materials and living things.

They have explored the properties of some basic materials around them.

They have compared and grouped objects in a variety of ways. They may understand the concept of floating and sinking.

National curriculum objectives	Children's objectives
<p>Distinguish between an object and the material from which it is made.</p> <p>Identify and name a variety of everyday materials including wood, plastic, glass, metal, water and rock.</p> <p>Describe the simple physical properties of everyday materials.</p> <p>Compare and group together a variety of everyday materials on the basis of their simple properties.</p>	<p>I can distinguish between an object and the material it is made from.</p> <p>I can explain the materials an object is made from.</p> <p>I can name wood, plastic, glass, metal, water and rock.</p> <p>I can describe the properties of everyday materials. (hard, soft, stretchy, stiff, shiny, dull, rough, smooth etc.)</p> <p>I can group objects based on the materials they are made from.</p>
<p><u>Scientific enquiry</u></p> <p>Observing closely, using simple equipment.</p> <p>Performing simple tests.</p> <p>Identifying and classifying.</p> <p>Using their observations and ideas to suggest answers to questions.</p> <p>Gathering and recording data to answer questions.</p>	<p>I can carry out simple tests to investigate the properties of materials.</p> <p>I can make simple observations using appropriate language to describe materials.</p> <p>I can compare materials.</p> <p>I can sort and group materials and objects according to their simple properties.</p> <p>I can suggest what I have found out about materials.</p> <p>I can say how I found it out.</p> <p>I can record my findings in a simple table.</p>

Assessment
<p>Sort the objects and describe how you have sorted them.</p> <p>Sort the objects according to the material they are made from.</p> <p>Find something that is made of plastic, wood etc.</p> <p>Sort the materials according to these characteristics.</p> <p>Which materials are eg waterproof? How did you find out?</p> <p>Which materials are strong/ best for eg the dogs bedding? How did you find out?</p> <p>What is the object made of? What is it's properties?</p>

Working Towards	Expected	Exceeded
<p>I can sort objects in different ways. With support, I can distinguish between an object and the material it is made of. I can start to identify objects made of wood, plastic, glass, metal, water and rock on my walk around the school. I can sort materials according to some of their observable properties (hard, soft, stretchy, stiff, shiny, dull, rough, smooth etc.) I</p>	<p>I can sort objects in different ways including the material they are made of. I can distinguish between an object and the material it is made of. I can identify objects made of wood, plastic, glass, metal, water and rock on my walk around the school. I can sort materials according to their observable properties (hard, soft, stretchy, stiff, shiny, dull, rough, smooth</p>	<p>I can confidently sort objects in different ways including the material they are made of. I can distinguish between an object and the material it is made of. I can identify and give examples of objects made of wood, plastic, glass, metal, water and rock on my walk around the school. I can confidently sort materials according to their observable properties (hard, soft, stretchy,</p>

can describe the properties of an object with support. I can say which materials are waterproof. I can say which materials are strong/soft and warm .	etc.) I can describe the properties of an object. I can say which materials are waterproof and how I found out. I can say which materials are strong/soft and warm and how I found out.	stiff, shiny, dull, rough, smooth etc.) I can describe the properties of an object stating what it might be used for. I can say which materials are waterproof and describe how I found out using my results. I can say which materials are strong/soft and warm and describe how I found out using my results.
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### Key Vocabulary

Names of everyday materials; **wood, plastic, glass, metal, water, rock.**  
 Properties of materials; **hard/soft, stretchy, rough, bendy, waterproof, shiny, dull, see-through, not see-through.**  
**Observe;** look closely.  
**Predict;** state what might happen.  
**Table;** a way of organising our results.  
**Test;** a way to find out.

Character opportunities	Possible STEM careers
Curiosity and critical thinking Self motivation and ambition	Architect Engineer Builder Designer Artist eg sculptor

Working Scientifically	Lesson objective	Suggested activity
Observing closely	Identify and name a variety of materials Children can differentiate between the material and the object	Find out what <b>materials</b> the children know. Go on a material hunt around school. How many examples of a material can they find that has been used in different ways (eg <b>wood</b> , concrete) Take photos of different materials. Children <b>label</b> different materials. Attach labels to different materials in the class so that children become familiar with them. Consider some instances where materials have been made to look like something else eg <b>concrete</b> to look like <b>stone</b> or <b>plastic</b> to look like wood. Introduce <b>transparent, translucent and opaque</b> materials
Sorting and grouping according to properties To use a table to show results	To identify different materials  To recognise that some objects are made of more than one material	Sort and group materials See <a href="https://www.hamilton-trust.org.uk/science/year-1-science/everyday-materials-lets-build/">https://www.hamilton-trust.org.uk/science/year-1-science/everyday-materials-lets-build/</a> also: Material dominoes - from a selected group of objects, one child places an object, the next places an object that has one of the materials in the first object, the next player chooses another object with some of the same material as the second object etc etc. Play material odd one out 20 questions - one child selects an object in secret and the others have to ask questions with only yes and no answers Complete a simple 2 column <b>table</b> showing which objects are made of which materials
Making careful observations Sorting and grouping according to properties	To know that materials are chosen because of their properties and that some materials have more than one property To describe in simple terms the properties of materials	Using a collection of objects, ask children to list the materials they are made of. When they have done this, get them to suggest what materials would not be good for that object and why Colate a series of silly inventions (eg Chocolate teapots etc) Also consider that materials may have different properties, eg plastic can be made into a builder's hard hat or alternatively flexible piping
Making careful observations Carry out simple tests and say what they have found out	To know that materials are chosen because of their properties	Set up a simple investigation for eg the best waterproof material, The softest for a dog's bed, best to make a boat, best for a submarine etc
Children can carry out simple investigations Children can make simple <b>predictions</b>	To know that materials are chosen because of their properties To describe in simple terms the properties of materials	See session 5 <a href="https://www.hamilton-trust.org.uk/science/year-1-science/everyday-materials-lets-build/">https://www.hamilton-trust.org.uk/science/year-1-science/everyday-materials-lets-build/</a> Read story of 3 pigs Can children build a house for the 3 pigs. Define what the criteria for a 'good' house will be
Children can carry out simple investigations	To know that materials are chosen because of their properties To describe in simple terms the properties of materials	See session 6 <a href="https://www.hamilton-trust.org.uk/science/year-1-science/everyday-materials-lets-build/">https://www.hamilton-trust.org.uk/science/year-1-science/everyday-materials-lets-build/</a>
Using their observations and results of tests, children suggest ideas to answer questions	To know that materials are chosen because of their properties	Consider How different houses are built in the world eg houses made of clay, sticks etc. What do children think the pros and cons for each type of house are? Consider how houses looked before the invention of plastics etc