

## Science

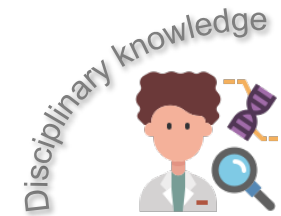
## Year 1

## Everyday Materials

Working Scientifically

During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- asking simple questions and recognising that they can be answered in different ways
- observing closely, using simple equipment
- performing simple tests
- identifying and classifying
- using their observations and ideas to suggest answers to questions
- gathering and recording data to help in answering questions.



Big Ideas

1

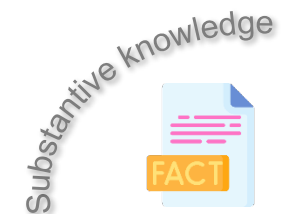
There is a relationship between structure and function

2

Living and non-living things can be grouped in a variety of ways

## National Curriculum Objectives

- distinguish between an object and the material from which it is made
- identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock
- describe the simple physical properties of a variety of everyday materials
- compare and group together a variety of everyday materials on the basis of their simple physical properties.



## Links to prior learning

### Early Learning Goal: People, Culture and Communities

- Describe their immediate environment using knowledge from observation, discussion, stories and non-fiction texts and maps.

### Early Learning Goal: The Natural World

- Explore the natural world around them, making observations and drawing pictures of plants and animals.
- Understand some processes and changes in the natural world around them, including the seasons and changing states of matter.
- Pupil should understand that we use materials to make things in the context of familiar stories, for example 'The Three Little Pigs'.

**Vocabulary:** Linked to familiar stories, for example, 'The Three Little Pigs' (straw, bricks, sticks, wood, rock).

## Common Misconceptions

- ! **Confusing Object and Material:** An object is what is formed from a material.
- ! **Lack of Awareness of Everyday Materials:** Reinforce the identification of common materials such as wood, plastic, glass, metal, water, and rock, highlighting their prevalence in everyday life.
- ! **Limited Understanding of Physical Properties:** Emphasise that materials possess various physical properties, including colour, texture, hardness, flexibility, and transparency. Encourage exploration and observation to identify these properties.
- ! **Overlooking Common Materials:** Stress the importance of understanding and appreciating the materials that surround us daily, as these are often the building blocks of our environment.
- ! **Assuming Homogeneity:** Highlight that even materials of the same type can have variations in properties. For example, not all woods have the same hardness or colour.
- ! **Not Recognising Material Groups:** Conduct activities that involve sorting and categorizing materials based on shared characteristics. For instance, group materials based on whether they are natural or man-made.
- ! **Ignoring Environmental Impact:** Emphasise the importance of considering the environmental impact of materials. Discuss how some materials are sustainable, while others may have negative consequences for the environment.

## Building component knowledge - Everyday Materials

What materials are these objects made from?

What properties do materials have?

What material is best at absorbing water?

What material is best at keeping us dry - is waterproof?

## Everyday Materials – Unit Preparation

### Suggested Significant People

Beyond living memory...

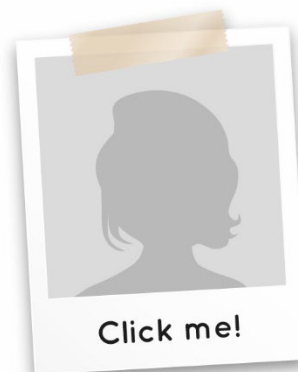
**Charles Macintosh** (1766-1843)



Scottish inventor of the first, modern waterproof raincoat

Within living memory...

**Charlotte McCurdy** (unknown-present)



American designer and researcher who blends science and design to reframe existential threats

### Vocabulary

**Tier 2:** object, wood, plastic, metal, rock, water; hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/not waterproof.

**Tier 3:** properties, material, opaque/transparent absorbent/not absorbent

**Disciplinary (non-statutory):** answer, classify, communicate, compare, data, enquiry, equipment, gather, group, identify, measure, observe, pattern, practical activity, question, record, relationship, secondary source, sort, test



### Reading List 'Disciplinary Literacy'

Everyday Materials  
- Peter Riley

Everyday Materials  
(FUNdamental Science) - Ruth Owen

Everyday Materials  
- Nichola Tyrrell

Materials (Engage Literacy) - Anne Giulieri

Let's Build a House:  
A book about buildings and materials - Mick Manning

### Possible Enrichment Opportunities



#### Inside the classroom

- [STEM](#) offers lots of freely available practical ideas for extending learning inside the classroom.
- Evaluate use of materials in packaging, link to environmental issues.
- Invite local resident to talk about how they use materials in their work.



#### Out and about – the local area

- Organise a materials walk in and around the school grounds and local area; this could include a visit to the shops.



#### Out and about – further afield

- [KS1 themed visits | Science Museum](#) - identify, compare/contrast the materials used to make household appliances and gadgets.

### Resources

**Enquiry 1+2:** range of objects made from one and more than one type of material.

**Enquiry 2:** As above.

**Enquiry 3:** sets of absorbent materials, 5ml measuring spoons.

**Enquiry 4:** objects for 'I spy', egg timers, cups, elastic bands.

**Enquiry 5:** a made-up catalogue, real objects, collection of images with items made of odd materials.

## Enquiry

## 1

## What Materials Are These Objects Made From?

## Why this? Why now?

This enquiry introduces pupils to the concept that different objects are made from different materials. Pupils will deepen their understanding of the term 'material' and learn how this can be used to describe and sort a wide range of objects.



## Substantive Knowledge

- Name a variety of everyday materials.
- Know that objects are made from materials.



## Disciplinary Knowledge

- Know how to sort objects according to the material they are made from.

**Vocabulary:** material, object, wood, plastic, metal, rock, water

**Resources:**

- a collection of objects made solely of one material, including the same object made of different materials. Include rock (often left out) which is used in buildings as an example.
- pictures of objects for individual/paired sort
- a couple of objects made of more than one material e.g., wooden box with metal hinge.

## Lesson outline

**Recap prior learning** from early years - briefly remind pupils of the story of the Three Little Pigs. What materials did they make their houses from? Ensure pupils understand the word *material* – that all things are made of materials.

Use a wide collection of **objects** made of a single **material** (to start with). Include objects made **solely** of wood, plastic, metal, rock etc. As a class, sort into objects made of the same material. This could be done using hoops (not overlapping at this stage) labelled with each material.

Ensure that pupils are secure with the following concepts by sharing the following **little ideas**:

- An **object** is something that you can touch. A **material** is what the object is made from.


Ask pupils to put these into worked examples such as: *'This object is a watering can. The material it is made from is metal.'*

Choose some objects that have the same use but are made from different materials, for example a watering can (can be made of metal or plastic). Ensure pupils can name the materials wood, plastic, metal, rock correctly.

In pairs or individually, pupils to **sort** trays of materials/photographs of objects into wood, plastic, metal, rock. Encourage them to reinforce stem sentences in pairs.

 Individually in drawn hoops or in a whole class book for later retrieval.

**Reinforce learning from this lesson** so that pupils **distinguish between an object and the material from which it is made** –

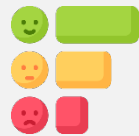
 Pupils should independently answer the enquiry question – **What Materials Are These Objects Made From?** Consider what method would be most appropriate to record this based on the ability of the cohort. This could include simple written sentences (to demonstrate emergent disciplinary writing), a labelled picture or even a sound or video recording.

Finish the lesson by revisiting and discussing the **little ideas** below – encourage pupils to share some examples that prove this idea to be true:

- An **object** is something that you can touch. A **material** is what the object is made from.

Take time to ensure that all pupils have a secure understanding of this by encouraging them to link their explanations to the objects they have sorted.

If time allows, allow pupils (as a class or individually) to complete a short quiz such as 'Activity 2: Objects and materials quiz' ([Objects and materials - BBC Bitesize](#))



**Ready to progress?**

- Do pupils understand the term *material* to mean more than just fabric?
- Can pupils name a variety of everyday materials and sort objects according to the material/s they are made from?



## What Properties Do Materials Have?

### Enquiry

# 2

#### Why this? Why now?

This session builds on pupils understanding that objects are made from a range of different materials. Pupils will deepen their understanding to consider the properties of materials and begin to think about why they are suited to their purpose. They will link their learning to the discoveries of a significant person.

	<h4>Substantive Knowledge</h4>		<h4>Disciplinary Knowledge</h4>
	<ul style="list-style-type: none"> <li>- Describe and name the simple physical properties of a variety of everyday materials.</li> </ul>		<ul style="list-style-type: none"> <li>- Know that science is about asking questions</li> <li>- Ask and suggest answers to one key question: What properties does the material have?</li> <li>- Using observation of the different materials, suggest answers.</li> </ul>
<p><b>Vocabulary:</b> object, material, properties, hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; opaque/transparent</p>			
<p><b>Resources:</b> a collection of carefully chosen objects which clearly demonstrate the contrasting properties on the list of key words.</p>			
<h4>Lesson outline</h4>			
<p><b>Recap prior learning</b> by <i>briefly</i>, playing I Spy to <b>re-establish</b> that objects can be made from different materials. Include several items/objects made from more than one material. For example: I spy with my little eye something made from glass and plastic beginning with the letter 'w'. Answer window. A window is an object made from <i>glass</i> and <i>plastic</i>.</p>			
<p>Ensure pupils remember the key concepts from the previous lesson: <b>An object is something that you can touch. A material is what the object is made from.</b></p>			
<p>Emphasise the new vocabulary <b>transparent/opaque</b> by using the window as an example contrasted with an object made from an opaque material, for example a plastic tray.</p>			
<p>Introduce the idea of using our <i>senses</i> of sight and touch to work out the <i>properties</i> of materials. Display key words (from vocabulary above) and read them through with the pupil. Use an example hidden in a bag. For example, a saucepan. Feel the object and choose words from the key words to describe how it feels.</p>			
<p>Work through some examples using different objects so that pupils develop a secure conceptual understanding of this: <i>'This object is a saucepan. The properties of the material this object is made from is: hard, stiff, shiny, smooth, not bendy.'</i></p>			
<p>Share the following <b>little idea</b> so that pupils have a secure ad shared understanding of the term 'properties':</p>			