

Upper Key Stage 2 Materials and their Properties

Introduction

This book of Science activities aims to help the busy teacher deliver high quality science lessons with as much manageable practical classroom work as possible.

The book covers all of the National Curriculum Science work on 'Materials and their Properties' at a level suitable for Upper KS2. Other books in this series cover the same work at a level suitable for Lower KS2 and KS1. Used together, these books can provide differentiated work for children of different age groups and abilities.

All the activities are cross-referenced to the QCA Science Curriculum.

Each lesson follows a similar format with the following elements:

- 1 A simple information sheet with questions that explore the main concept to be studied during the lesson.
- 2 A simple investigation which on the whole can be carried out by small groups of children working independently.
- 3 A 'SAT' style homework sheet which reinforces the concept discussed and the knowledge gained from the investigation carried out.
- 4 Detailed notes for teachers which list the Learning Objectives, the main points to be talked about, the equipment needed for the investigation, how the investigation should be carried out and the conclusion that can be drawn from it.

The book also contains simple assessment activities that can be used to help indicate the National Curriculum Level each child is working at and whole class record sheets for keeping track of the results.

Topical Resources publishes a range of Educational Materials for use in Primary Schools and Pre-School Nurseries and Playgroups.

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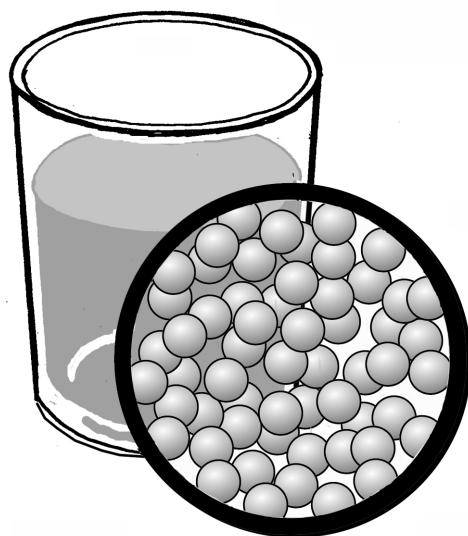
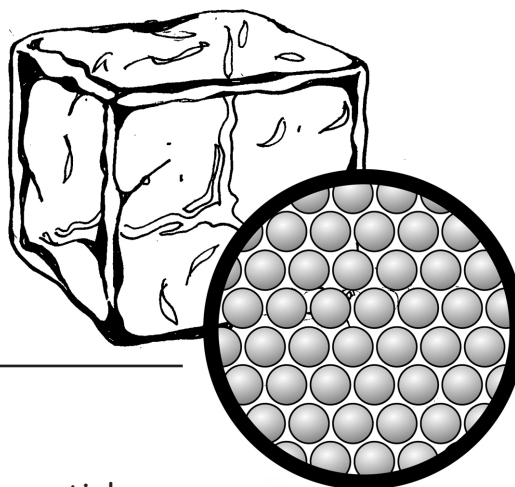
Solids, Liquids and Gases

Anything you can think of is a solid, a liquid or a gas.

All things are made of very tiny particles called atoms or molecules. These particles are so small that you cannot even see them with a powerful microscope.

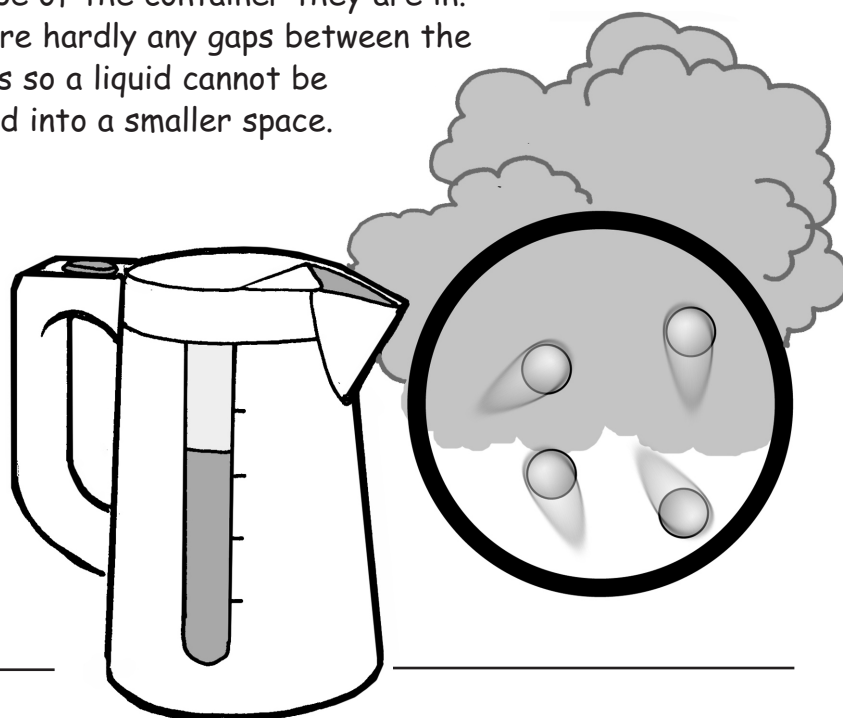
Solids

In solids the particles are very close together. They hold onto each other tightly and this stops the particles moving around. This is why solids don't flow and cannot be easily squashed.



Liquids

In liquids the particles are very close together but they don't hold on to each other very strongly. The particles constantly move around changing places all the time. They flow easily and take up the shape of the container they are in. There are hardly any gaps between the particles so a liquid cannot be squeezed into a smaller space.



Gases

In a gas the particles move around and constantly bump into each other. Gases flow easily and spread out to fill any available space. Because of the big gaps between the particles, gases can easily be squeezed into a smaller space.

Task

Answer these questions:

1. Are the particles inside a solid very close together?
2. Do the particles inside a solid move around?
3. Are the particles inside a liquid close together?
4. Do the particles inside a liquid move around?
5. Are the particles inside a gas very close together?
6. Do the particles inside a gas move around?
7. Draw diagrams which show the particles inside a solid, a liquid and a gas.

Name: _____

Date: _____

What happens when ice is turned to water vapour?

Your teacher will demonstrate how to turn ice into water vapour.

Observe and then fill in this table.

Write YES or NO	Solid	Liquid	Gas
Can they flow?			
Can they be squashed?			
Can they change their shape?			
Do the particles hold on to each other?			
Are the particles close together?			

In your own words, describe what happens to the tiny particles (atoms or molecules) when ice changes to water and then into water vapour.

Name: _____

Date: _____

Solids, Liquids and Gases

1. Name three materials that you normally see as a solid.

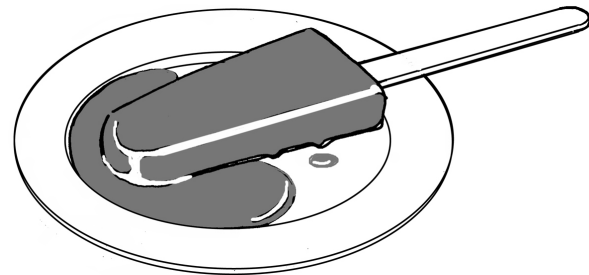
2. Name three materials that you normally see as a liquid.

3. Name three gases that you know of.

4. How can a block of ice be turned into water?

5. How can water be turned into steam or water vapour?

6. Gemma puts an ice-lolly on a dish and watches what happens. After 45 minutes the ice-lolly turns to liquid. What is the process called when a solid turns to a liquid?



Anna, Owen, Jack and Raj each had an ice cube on their desk. They timed how long each ice cube took to completely melt. Here are the results: Anna's cube took 30 minutes. Owens's cube took 41 minutes. Jack's cube took 35 minutes. Raj's cube took 52 minutes.

7. Whose desk was in the warmest part of the room? _____

8. How do you know this? _____

9. Whose desk was in the coolest part of the room? _____

10. How do you know this? _____

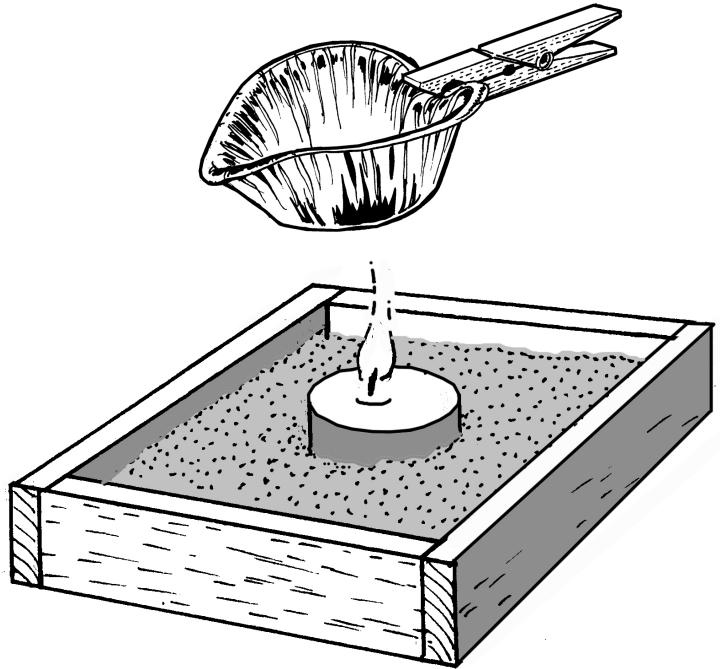
11. What would the children keep the same to make sure this was a fair test?

Change Caused by Heating

Some children heat food in metal foil bun cases. They hold the bun cases over a small lit candle which has been placed in a tray of sand.

Here are the results:

Food	Change
Chocolate	Melts
Crisp	Burns
Cheese	Melts
Bread	Toasts



1. When chocolate melts, is this a reversible change? _____
2. When a crisp burns, is this a reversible change? _____
3. When cheese melts, is this a reversible change? _____
4. When bread toasts, is this a reversible change? _____
5. Why was a wooden peg used to hold the metal bun case in the flame?

6. Why was the candle placed in a sand tray before it was lit?

Next three ice cubes were heated in metal bun cases. Here are the results:

7. Describe how the size of the ice cube affects the time it takes to melt.

