



# Central School

## Home School Package







**Year : 8**

**Subject : Basic Science**

## **HOME SCHOOL PACKAGE CONTENT**

This home school package contains 6 lesson plans. These lessons are to be done on week 7 and week 8 of term 2. Students are expected to do 3 lessons per week, to complete all lessons in the 2 weeks that the lessons are allocated for.

## LESSON Plan

 Teacher	Name : Nae Natapei Subject : Basic Science
 Date	
	Topic : Materials Lesson number 1: – Materials and Objects
 Learning outcomes	<ul style="list-style-type: none"><li>• Distinguish between an object and the material from which it is made.</li><li>• Identify materials used to make everyday objects.</li></ul>
 Introduction	Look at your pencil case. What is it made of?  Look at the chair you are sitting on now. What is it made of?  Materials are the matter or substance that objects are made from.
	Catch phrase for the lesson



## Learners notes

### Summary

We use a wide range of different objects daily, these objects are made from different materials. For example nails are made of iron, so iron is the material that is used to make nails. Other materials include ;

- a) plastic
- b) wood
- c) glass.
- d) ceramics.
- e) wool
- f) paper
- g) leather
- h) rubber
- i) sand
  - fibres.
  - Other metals and many more.

An object can be made out of different materials used together; for example, a chair can be made from metal and wood and plastic.



## Visual aids






## Exercises






Find 7 objects that you use everyday.







Complete the table below, by filling in the name of the object, and what it is made of. The first one has been done for you.

Name of Object	Material(s) it is made of
Pencil	Wood and graphite







 Assignment	
 Assessment	This topic will be assessed in your topic test.
 References	

## LESSON Plan

 Teacher	Name : Nae Natapei Subject : Basic Science
 Date	
	Topic : Materials Lesson number 2 : – Natural and Man-made materials
 Learning outcomes	<ul style="list-style-type: none"><li>• Distinguish between man-made and natural materials.</li><li>• List examples of man-made materials.</li><li>• List examples of natural materials.</li></ul>
 Introduction	The materials that are used to make these object that we use everyday can be divided into 2 groups. Natural materials and man-made materials.
	Catch phrase for the lesson

 <p>Learners notes</p>	<p><b>Summary</b></p> <p>Coal and wood are materials that have been formed naturally and can be used in their natural state. Glass and plastics are not formed naturally and are man-made.</p> <p>Man-made (synthetic) materials are manufactured in factories. Glass, for example, is manufactured from sand and limestone.</p>				
 <p>Visual aids</p>					
 <p>Exercises</p>	<p>List each material below, in the correct column of the table below.</p> <p>Plastic, paper, coal, wool, wood, stone, cotton, leather, silver, rayon, polystyrene, Diamond, clay, Gold, Glass, Rubber, Silk, Nylon, Oil, Iron, Steel, Wood, Marble, Wax.</p> <table border="1" data-bbox="440 996 1460 1467"> <thead> <tr> <th data-bbox="440 996 951 1037">Natural materials</th><th data-bbox="951 996 1460 1037">Man-made materials</th></tr> </thead> <tbody> <tr> <td data-bbox="440 1037 951 1467"></td><td data-bbox="951 1037 1460 1467"></td></tr> </tbody> </table>	Natural materials	Man-made materials		
Natural materials	Man-made materials				
 <p>Assignment</p>					
 <p>Assessment</p>	<p>This topic will be assessed in your topic test.</p>				
 <p>References</p>					

## LESSON Plan

 Teacher	Name : Nae Natapei Subject : Basic Science
 Date	
	Topic : Materials Lesson number 3 : – Metals and Non- metals
 Learning outcomes	<ul style="list-style-type: none"><li>• Differentiate between metals and non-metals.</li><li>• State the physical properties of metals.</li><li>• State the physical properties of non-metals.</li><li>• Name some plastics and their uses.</li><li>• Name some natural fibres.</li><li>• Name some synthetic fibres.</li></ul>
 Introduction	Materials can be divided into different groups. 2 of these groups are metals and non-metals. Much of the time, you can tell a material is a metal simply because it is shiny, but this isn't the only distinction between these two general groups of materials.
	Catch phrase for the lesson





## Learners notes

### Summary

#### METALS AND NON-METALS

Physical Properties of Metals- Iron, Aluminium, Steel, Copper e.t.c

Heavy and sink in water

Sink in water

Feel cold

Most metals are shiny

Hard and rigid (do not bend)

Conductors of electricity and heat

Physical Properties of Non-Metals

Wood, Plastic and cloth are **non-metals**

#### WOOD-

Wood is made from cellulose fibres which look like tiny threads.

#### Physical Properties of Wood

Lighter than metals

Feel warm and looks dull

Hard

Insulator of electricity and heat.

Soft wood will float, while harder woods will sink in water.

#### PLASTICS

We use many different types of plastics. Below are some plastics and their uses:

**Nylon:** Tents, umbrella, Parachutes

**Polyvinylchloride (PVC):** Water pipes, plastic bottles

**Polythene:** Plastic bags, Cling wrap

**Polystyrene:** Plastic forks, spoons, Toys, rulers, haircomb

**Polypropene:** ropes, carpets.

#### Physical Properties of Plastic




Light and (some)float in water.



Hard and flexible

Stiff ( bends with an effort)







Insulator of electricity and heat.




Flammable( burns easily)


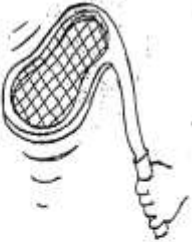


	<p><b>CLOTH:</b> Cloths are made from fibres which have been twisted together to form yarns, which are then woven together into cloth. The fibres used to make cloth can be natural like- <i>cotton, wool and silk</i> or they can be manmade (synthetic) like- <i>nylon, rayon, acrylic and polyester</i>.</p>
 Visual aids	
 Exercises	<p>Study the notes above, then answer the following questions.</p> <ol style="list-style-type: none"> <li>1. If you were given 2 blocks of exactly the same size and asked to identify which one is the metal and which one is the non-metal block without touching it, how will you identify the 2 blocks.</li> <li>2. If you were blindfolded and given 2 blocks of exactly the same size and asked to identify which one is the metal and which one is the non-metal block, how will you identify the 2 blocks.</li> <li>3. Name the type of plastic that is used to make ; <ol style="list-style-type: none"> <li>a) garbage bags.</li> <li>b) Plastic forks</li> </ol> </li> <li>4. Write down one important physical property of plastics that is not mentioned in the notes. <i>Clue : the reason why plastics are used for umbrellas and tents.</i></li> <li>5. Fibres are twisted together to form _____, which are woven together to form _____.</li> <li>6. Name 2 examples of natural fibres.</li> <li>7. Name 2 examples of synthetic fibres.</li> </ol>
 Assignment	







 Assessment	This topic will be assessed in the topic test.
 References	


## LESSON Plan

 Teacher	Name : Nae Natapei Subject : Basic Science
 Date	
	Topic : Materials Lesson number 4- Properties and uses of materials.
 Learning outcomes	<ul style="list-style-type: none"><li>• Define what the term property means.</li><li>• justify why certain materials are not suitable for certain objects.</li></ul>
 Introduction	Different materials have different features, or properties, which make them suitable for different uses.
	Catch phrase for the lesson



 <p>Learners notes</p>	<p><b>Summary</b></p> <p>Some materials maybe more suitable than others for particular uses or for manufacturing specific objects; for example, metal shoes wouldn't be very comfortable and a cardboard door wouldn't be very strong!</p>
 <p>Visual aids</p>	
 <p>Exercises</p>	<p>Think about what the different objects below are used for and complete the table below by writing down reasons why the material is not suitable for the object and suggest another more suitable material.</p>

Object	Why this material is not suitable	Two materials that would be more suitable
metal shoes 		
rubber tennis racket 		
glass car 		
plastic cooking pots 		

Object	Why this material is not suitable	Two materials that would be more suitable
cardboard nails 		
wooden envelope 		
thin fabric suitcase 		
rock curtains 		
rubber coins 		
paper balloons 		









Assignment

 Assessment	This topic will be assessed in the topic test.
 References	



## LESSON Plan

 Teacher	Name : Nae Natapei Subject : Basic Science
 Date	
 Topic : Materials Lesson Number : 5- Density	
 Learning outcomes	<ul style="list-style-type: none"><li>• Define density</li><li>• Calculate density.</li><li>• Relate density to floating and sinking.</li></ul>
 Introduction	<p>One of the basic physical properties of materials is density. It is a word we use to describe how much space an object or substance takes up (its volume) in relation to the amount of matter in that object or substance (its mass).</p> <p>Another way to put it is that density is the amount of mass per unit of volume.</p>
 Catch phrase for the lesson	



## Learners notes

### Summary

Density is the mass of  $1\text{cm}^3$  of the substance.

The unit for density is  $\text{g/cm}^3$ .

Water has a density of  $1\text{g/cm}^3$ .

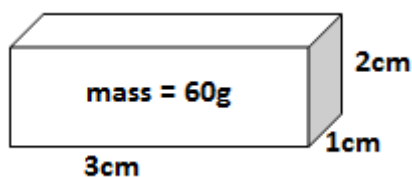
Anything that has a density of more than  $1\text{g/cm}^3$  will sink in water. Anything that has a density of less than  $1\text{g/cm}^3$  will float in water.

Density can be calculated using the formula :

$$\text{Density} = \frac{\text{mass (g)}}{\text{volume (cm}^3\text{)}} \text{ or } \text{mass} \div \text{volume}$$

Examples : Calculate the densities of the blocks below, and state whether they will sink or float in water.

a)

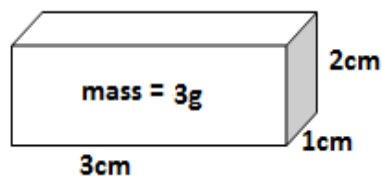


$$\begin{aligned}\text{Mass} &= 60\text{g} \\ \text{volume} &= 3\text{cm} \times 2\text{cm} \times 1\text{cm} = 6\text{cm}^3\end{aligned}$$

$$\begin{aligned}\text{Density} &= \text{mass} \div \text{volume} \\ &= 60\text{ g} \div 10\text{cm}^3 \\ &= 6\text{ g/cm}^3.\end{aligned}$$

The block will **sink** in water, because its density is **greater** than  $1\text{ g/cm}^3$ .



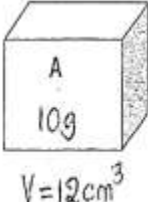
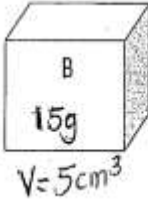
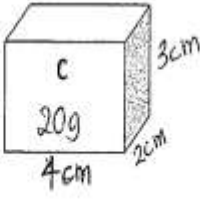
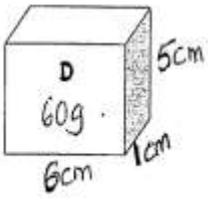



b)








$$\begin{aligned}\text{Mass} &= 3\text{g} \\ \text{Volume} &= 3\text{cm} \times 2\text{cm} \times 1\text{cm} = 6\text{cm}^3\end{aligned}$$

$$\begin{aligned}\text{Density} &= \text{mass} \div \text{Volume} \\ &= 3\text{ g} \div 6\text{ cm}^3 \\ &= 0.5\text{ g/cm}^3.\end{aligned}$$

The object will **float** in water, because its density is **less** than  $1\text{ g/cm}^3$ .

 Visual aids	
 Exercises	<p>Calculate the densities of the following blocks and state whether they will float or sink in water.</p> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  <p>A 10g <math>V=12\text{cm}^3</math></p> </div> <div style="text-align: center;">  <p>B 15g <math>V=5\text{cm}^3</math></p> </div> <div style="text-align: center;">  <p>C 20g 4cm 2cm 3cm</p> </div> <div style="text-align: center;">  <p>D 60g 6cm 1cm 5cm</p> </div> </div>
 Assignment	
 Assessment	This topic will be assessed in a practical test.
 References	

## LESSON Plan

 Teacher	Name : Nae Natapei Subject : Basic Science
 Date	
 Topic : Materials Lesson Number : 6 – Elements, Compounds and mixtures.	
 Learning outcomes	<ul style="list-style-type: none"><li>• Differentiate between an element a mixture and a compound.</li></ul>
 Introduction	<p><u>C: ELEMENTS AND COMPOUNDS</u></p> <p>All substances are made up of tiny particles called <b>Atoms</b>.</p> <p><b>Element:</b> Substance which contain the same type of atoms</p> <p><b>Mixture:</b> substance which contain two or more different types of atoms. These atoms have not joined together so they can easily be separated.</p> <p><b>Compound:</b> Substance which contain two or more different types of atoms. These atoms have been joined together and are not easy to separate.</p>



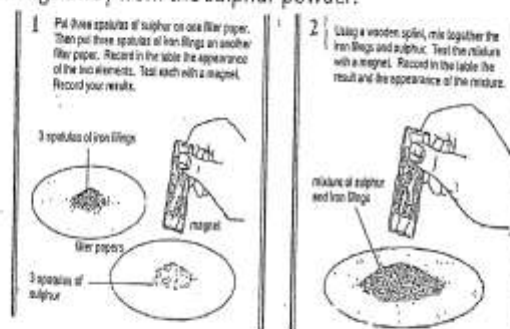
## Catch phrase for the lesson



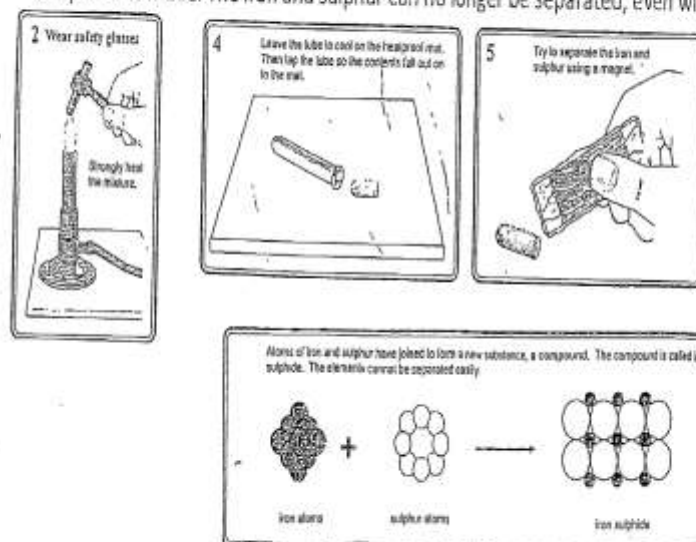
## Learners notes

## Summary

When sulphur atoms are mixed with iron fillings a mixture is formed and because the atoms are not joined, the iron and sulphur can easily be separated using a magnet to attract and remove the iron fillings away from the sulphur powder.



But if the sulphur and iron mixture is heated, the iron and sulphur atoms will join together and a compound is made. The iron and sulphur can no longer be separated, even with a magnet.



This shows us that when a compound is formed or when atoms of two different elements are joined together, energy is given off.

## 4.4 Compounds

Starting  
off 2

Iron and sulphur are two of the elements.



1 You can mix powdered iron and powdered sulphur without making a new chemical. You can still see the sulphur in the mixture. You can still pull the iron away with a magnet.



2 But if you heat a mixture of iron and sulphur, a glow passes through the mixture. This time a new chemical is formed.

(This is best done in a fume cupboard.)



3 The new chemical is called **iron sulphide**. It contains sulphur (but you can't see any yellow in it). It contains iron (but you can't pull it away using a magnet).

### Mixtures, chemical reactions, and compounds

Whenever two or more substances are mixed together without joining up, a mixture is formed. The substances can usually be separated easily. The iron and sulphur powders make a mixture because the atoms don't join up. But when the mixture is heated, a chemical reaction takes place. The iron and sulphur atoms do join up. That's when the new chemical is formed.

Iron sulphide is called a **compound** because it contains iron atoms joined to sulphur atoms.

Most chemicals are compounds. The photographs shown here illustrate three common compounds. A compound's name may tell you which elements are joined up in it. **Copper iodide**, for example, contains **copper** and **iodine**.



Common salt (sodium chloride)



Sand (silicon dioxide)








Water (hydrogen oxide)

- 1 What is a compound? ▲
- 2 Heating iron and sulphur produces a chemical reaction. What happens in the reaction? ▲
- 3 Why is it easier to separate atoms from a mixture than from a compound?
- 4 Which elements are joined up in: a) sand b) salt c) water?
- 5 Try to find out: the name of the main compounds found in: a) ruby b) rust c) the 'rotten egg' gas.

### Did you know?

- Over one million chemical compounds are known.
- Some compounds contain five or more different elements joined together.



 Visual aids	
 Exercises	Study the notes given and answer questions 1-4 from the attached page 45.
 Assignment	
 Assessment	This topic will be assessed in the topic test.
 References	



## WEEKLY CHECKLIST For Parents:

**Term: 2    Week number 1    Date..... to..... Month: .....**

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				
	6				

**Term: 2    Week number 2    Date..... to..... Month: .....**



Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				
	6				

**Term: 2    Week number 3    Date..... to..... Month: .....**

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				
	6				

**Term: 2    Week number 4    Date..... to..... Month: .....**

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				
	6				

**Term: 2    Week number 5    Date..... to..... Month: .....**

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				
	6				

**Term: 2    Week number 6    Date..... to..... Month: .....**

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				
	6				

**Term: 2    Week number 7    Date..... to..... Month: .....**

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				
	6				

**Term: 2    Week number 8    Date..... to..... Month: .....**

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				
	6				

**Term: 2    Week number 9    Date..... to..... Month: .....**

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				
	6				

**Term: 2    Week number 10    Date..... to..... Month: .....**

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				
	6				

**Term: 2    Week number 11    Date..... to..... Month: .....**

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				
	6				

**Term: 2    Week number 12    Date..... to..... Month: .....**

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				
	6				

**Term: 2    Week number 13    Date..... to..... Month: .....**

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				
	6				

