

1. The document name

Science\_6<sup>th</sup>\_Sorting of Material \_Prem\_kumar\_Kamra\_and\_Bhagwant\_Singh\_Govt. Model School, Dhrangwala&Kulrian

2. Section A. Basic description of the chapter

Name of the institute	Govt. Model School, Dhrangwala&Kulrian
Name of the teacher	Prem Kumar Kamra&Bhagwant Singh
Class to which chapter belongs	6 <sup>TH</sup>
Subject	Chemistry
Name of the chapter	Sorting of Material
No. of periods required to teach the chapter	9periods are required

Section B. Objectives / Expected learning outcomes

(The expected learning outcomes have been tabulated under four sub heads in the subsequent pages)

**B1Concepts : Write up in this sub section consists of listing of various concepts which are going to be covered in this chapter**

- 1) Objects around us
- 2) Objects of different shapes
- 3) Objects made up of different materials
- 4) Objects made of same material
- 5) Properties of material
  - a. Appearance
    - i. Lustrous
    - ii. Non-lustrous

- b. Hardness
  - i. Hard
  - ii. Soft
- c. Solubility
  - i. Soluble
  - ii. Insoluble
- d. Float/sink in water
- e. Transparency
  - i. Transparent
  - ii. Translucent
  - iii. Opaque

## **B2 Usefulness in daily life**

- Students will learn
  - Objects around us are made of a large variety of materials.
  - Different types of material have different properties.
  - Materials are grouped together on the basis of their similarities and differences.
  - Things are grouped together for convenience and to study their properties.
  - Some materials are soluble and some are insoluble in water.
  - One material can be used to make different types of objects.
  - Critical thinking of comparing n contrasting habits developes
  - Students learn how to organize things
  - Observation power increases
  - Enables students for logical thinking about concepts
- Without learning this concept they will not understand
  - the importance of sorting materials
  - Without grouping life becomes inconvenient
  - Importance of environment protection
  - Reason for time wastage and confusion increases

Career option- Scientist (Taxonomist)

Departmental Store  
 Grocery store  
 Analytical chemist  
 Museum/Gallery conservator  
 Material processing technologist  
 Environment manager  
 Pharmacologist  
 Forensic scientist

**B3 Life skills** The following life skills can be inculcated through the teaching of this chapter in the class

- How to establish relation with daily life with concept
  - Should be able to understand the usefulness of different materials.
  - Should be able handle various kind of materials.
  - Will be sensitized about hardness, solubility, transparency etc.
- Research Aptitude
- Observational Skills
- Team work
- Using technology like ICT
- Analytic Skills
- Reasoning ability
- Life skill techniques through- case studies, debates, decision mapping, group discussion, games and simulation
- Development of environment awareness
- Critical thinking
- Students can be linked to sort waste in daily life which can contribute to protect environment

#### **B4 Vocabulary**

Appearance, Lustre, Hard, Soft, Soluble, Insoluble, Float, Sink, Transparent, Translucent, Opaque,

S.N.	Word in English	Meaning in Punjabi	Pronunciation in English	Transliteration in Punjabi
1	Appearance	ਦਿਖਾਵਾ		

2	Lustre	ਚਮਕ		
3	Hard	ਸਖਤ		
4	Soft	ਨਰਮ		
5	Soluble	ਘੁਲਣਸ਼ੀਲ		
6	Insoluble	ਅਘੁਲਣਸ਼ੀਲ		
7	Float	ਤੈਰ		
8	Sink	ਡੁੱਬਣਾ		
9	Transparent	ਪਾਰਦਰਸ਼ੀ		
10	Translucent	ਅਲਪ-ਪਾਰਦਰਸ਼ੀ		
11	Opaque	ਅਪਾਰਦਰਸ਼ੀ		

### Section C. Prerequisites or Previous Knowledge (PK)

In order to test the previous knowledge of the students the teacher may ask following questions. These questions will motivate the children to take part in the class activities, make them attentive and they will grasp more while teaching the lesson.

1.Are different materials looks same or different?

2.When you go to departmental store do you find items mixed together or placed differently?

3.Do all substances float in water?

4 look at the objects placed in the classroom-

- Are they similar or made up of different materials
- Identify their shapes or state

Ask the students to sit in a circle with the material provided. Ask them to pick one material and describe about how it feels or looks and other descriptive words.

### Section D. Period wise break up for each chapter:

This chapter on Sorting of material may require 8 periods. The tentative break up of each chapter in various periods is as follows:

Period	What to be covered
1.	Introduction of the chapter through some activity, previous knowledge testing, Talking to the students regarding daily life phenomenon and events in which concepts of this chapter are involved, Teacher will bring some objects with him and ask the students to sort them out on the basis of similarities and differences among them. Teacher will perform Activity 1GA 1 of NCERT text book.
2.	Appearance and luster properties will be discussed with the help of activity GA2
3	Different objects made up of same material, The relation between property of material and their uses. Some examples based on the above statement will be given. Teacher will discuss Table 4.2 of NCERT text book. Sensitizing the students about various related career options.


	Hardness of different materials can be demonstrated. Teacher will perform the activity GA3.1 and GA3.2
4	The following properties of material will be discussed- -Appearance -Hardness Solubility Activity GA 4.1 and GA 4.2 will be performed.
5	The following properties of material will be discussed- -Solubility (Activity no. 4 & 5) Float/sink (GA5.1 and GA5.2) will be discussed
6	The following properties of material will be discussed- -Float/ sink in water -Transparency Transparent, Translucent, Opaque Activity no.6GA6 will be discussed.
7	Recapitulation of the chapterActivities GA7.1 and GA 7.2 will be discussed
8	Recapitulation:Home assignment will be given.Students report on the basis of previous day activity

## Section E.Micro planning of the periods or minute to minute breakup of periods

### Sub Section E.1 minute to minute breaks up of period1

Concept	Time	Indicative / guiding Script
P K Testing-	5 min	In order to test the previous knowledge of the students the teacher may ask following questions. These questions will motivate the children to take part in the class activities, make them attentive and they will grasp more while teaching the lesson. 1.Are different materials look same or different? 2.When you go to departmental store do you find items mixed together or placed differently?

Career options	5 min.	<p>3. Do all substances float or sink in water.?</p> <p>4. look at the objects placed in the classroom-</p> <ul style="list-style-type: none"><li>- Are they similar or made up of different materials</li><li>- Identify their shapes or state</li></ul> <p>Ask the students to sit in a circle with the material provided. Ask them to pick one material and describe about how it feels or looks and other descriptive words.</p>										
Introduction of the chapter through some activity, previous knowledge testing, ,	25 min	<p>Teacher will bring some objects with him and ask the students to sort them out on the basis of similarities and differences among them.</p> <p>Teacher will perform Activity 1 of NCERT text book.<u>annexure GA1</u></p> <ul style="list-style-type: none"><li>✓ Ask the students to sort the objects.</li><li>✓ Encourage the students to name some other objects made of same material also and then write it down on the b.b.</li><li>✓ Teacher will Question students on what basis they have sorted different objects.</li><li>✓ The following table will be filled with the help of questions asked from the students-</li></ul> <table><tr><th>Objects</th><th>Materials they are made of</th></tr><tr><td>Plate (<i>thali</i>)</td><td>Steel, glass, plastics (any other)</td></tr><tr><td>Pen</td><td>Plastics, metal</td></tr><tr><td>Chair</td><td>Wood, Plastic</td></tr><tr><td>Desk</td><td>Wood, iron</td></tr></table>	Objects	Materials they are made of	Plate ( <i>thali</i> )	Steel, glass, plastics (any other)	Pen	Plastics, metal	Chair	Wood, Plastic	Desk	Wood, iron
Objects	Materials they are made of											
Plate ( <i>thali</i> )	Steel, glass, plastics (any other)											
Pen	Plastics, metal											
Chair	Wood, Plastic											
Desk	Wood, iron											
Home assignment	5 min	<ul style="list-style-type: none"><li>✓ Teacher will ask the students to prepare a list of objects made of plastic, wood, iron, glass etc. (Students to be asked to write in note book with different colours in tabular form)</li><li>✓ Also ask them to collect pictures of objects made up of different materials.</li></ul>										

Annexure Name	GA1
Name of the activity	Lets sort material
Objective	1.Introducing the concept of sorting of material. 2. To increase the participation of the students.
Type of the activity( individual activity/ group activity / home activity etc.)	Group
Material required for the activity	Different materials like made up of wood, plastic, glass, metal etc
Any specific preparations required in the class room for performing the activity	---N.A.---
Details of the activity and detailed instructions to carry it out	Teacher will enter into class with some objects made up of materials like wood, plastic, glass, metal etc among students.
Pictures describing the activity, if any	
Any precautions to be kept in mind	Be cautious of sharp objects.
Explanation of the outcomes of the activity	Students will understand that objects are made up of different materials like wood, plastic, glass, metal etc



## Subsection E.2 Minute to minute breakup of Period 2

Discussion of previous period home task	5 min.	Teacher will discuss and check the list covered by students that was assigned to them in previous period. Teacher will encourage the lists made by students and show some good pictures collected by them.
Memory game play	20 min.	Divide the class into groups of 4-5 students. Place several objects on a table and ask the students to observe them carefully. Clear them that you have to go in another room and classify these objects on the basis of their properties. Write different objects made up from same material together.
Activity	10 min.	Activity GA2



### ACTIVITY GA 2

Take a copper wire, a piece of cotton swab, wood piece, aluminum rod and sand paper.

Observe these materials carefully and notice if they shine. Rub the surface of each material with sandpaper and observe carefully. Separate the shining and non - shining materials from each other. The surface of materials like aluminum rod and copper wire shine naturally or when sandpapered. The property of a material by virtue of which, it shines naturally or when cut or when it is sandpapered is known as **luster**. All metals like silver, gold, copper, aluminum, iron, graphite, diamond and mercury etc have shine or luster. The substances which have shine or luster are known as lustrous. Materials like paper, wood, plastic, cotton,

wax, foam, sponge etc, which do not shine, are non-lustrous substances. Now you can appreciate why gold and silver are used for making jewellery. This is because of the property of the metal to reflect light.

### Subsection E.3 Minute to minute breakup of Period 3

Discussion of previous period home task.	10 min	Teacher will discuss and check the list prepared by student that was assigned to them in previous period. Teacher will also encourage the lists made by students and show some good pictures collected by students.														
Different objects made up of same materials	10mins	<p>Table 4.2 lists some common materials. You can also add more materials in Column 1 that are known to you. Now, try and think of everyday objects you know, that are made mainly of these materials, and list them in Column 2.</p> <p>Property hardness will be discussed. Teacher will give some objects like sponge, cotton, rubber ball, duster, chalk, stone etc to the students and ask them to compress.</p> <p><u>Hard materials</u> -materials which cannot be compressed are called hard materials</p> <p><u>Soft materials</u> -materials which can be compressed are called soft materials</p> <p><b>Table 4.2 Different types of objects that are made from the same material-</b></p> <table><tr><th>Material</th><th>Objects made of these materials</th></tr><tr><td>Wood</td><td>Chair, table, plough, bullock cart and its wheels, ...</td></tr><tr><td>Paper</td><td>Books, notebooks, newspaper, toys, Calendars...</td></tr><tr><td>Leather</td><td><b>Purse, bag, shoes</b></td></tr><tr><td>Plastics</td><td><b>Toy, chair, table</b></td></tr><tr><td>Cotton</td><td><b>Shirt, pillow, dressing</b></td></tr><tr><td>Glass</td><td><b>Tumbler, window pan, mirror</b></td></tr></table>	Material	Objects made of these materials	Wood	Chair, table, plough, bullock cart and its wheels, ...	Paper	Books, notebooks, newspaper, toys, Calendars...	Leather	<b>Purse, bag, shoes</b>	Plastics	<b>Toy, chair, table</b>	Cotton	<b>Shirt, pillow, dressing</b>	Glass	<b>Tumbler, window pan, mirror</b>
Material	Objects made of these materials															
Wood	Chair, table, plough, bullock cart and its wheels, ...															
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Cotton	<b>Shirt, pillow, dressing</b>															
Glass	<b>Tumbler, window pan, mirror</b>															

		<b>Rubber</b> <b>Iron</b> <b>Earthern</b> <b>POP</b>	
Relation between type of material and their uses	5 min	Teacher will ask some questions to clarify the relation between type of materials and their uses. For example <ul style="list-style-type: none"> <li>• Tumblers are made up of glass, plastic or metal and not of cloth or paper.</li> <li>• Window panes, wind screens of vehicles are made up of glass and not of plastic</li> </ul>	
Activity	5 min.	<ul style="list-style-type: none"> <li>• Activity GA3.1 , GA 3.2</li> </ul>	
Home Task	5min	Teacher will assign home task to students to make a table showing different household objects and material they are made up of.	

Shown below are objects that might be found in a bedroom. Sort these objects into hard and soft categories.

Tick the correct answer



Hard/ soft



Hard/ soft



Hard/ soft



Hard/ soft



Hard/ soft



Hard/ soft

How was it to fill the answers in the sheet of paper? Did you have sufficient reasons to respond? How about getting some samples from home and touching them and then responding? May be the responses are more convincing and not memorized. Let us have fun with material. The worksheet would follow the activity of exchanging samples. Let students make a worksheet in the class and then use it.

## Warm up activity

## Activity GA 3.1

### Worksheet :2

**Aim:** To find whether the given materials are hard or soft.

**Material Required:** Collect different type of material and pictures of everyday objects.

**Method:** Plan group activity. Ask students to discuss among themselves to decide who can get what material. Avoid unnecessary repetition of objects. The greater the variety, the better is the possibility of learning. Samples will relate the theory with practical. Students can sort these into hard and soft categories and later paste the pictures on charts/sheets.

First few are done here



S.No. Picture of Material Hard/Soft

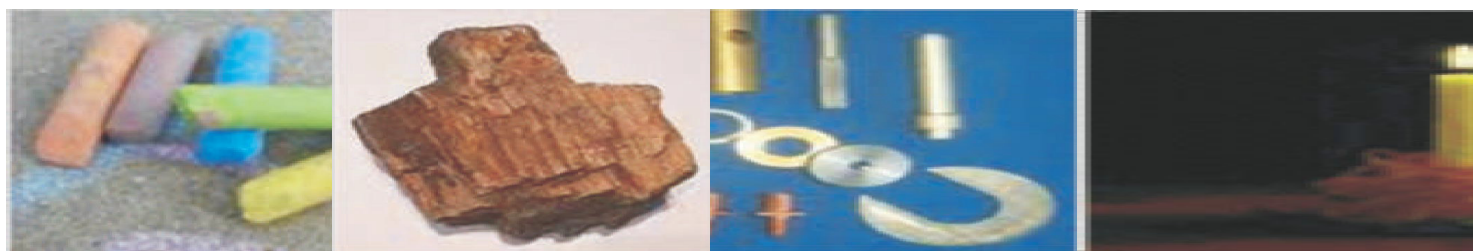
S. no.	picture	Hard/soft
1		soft
2		hard
3		Hard
4		Soft
5		Soft
6		hard

### Activity GA3.2

**Aim:** To test the hardness of the given materials.

**Materials required:** metal, candle, chalk, wood, and stone.

**Method:** we take a metal and try to scratch with it the surface of candle, chalk, wood, and stone. We will notice that we can easily scratch some materials like candle and chalk but not others like wood and stone. Record your observation in the table below.



Materials	Can be scratched	Soft/hard
Wood		
Chalk		
candle		


When you have a variety of substances you can compare their relative hardness or softness by using the scratch test. Scratch one substance using another. The substance which gets scratched is softer than the substance which scratches. That is why you get scratches on your skin if you move your nails against it. Diamond is the hardest substance. Black diamond is the hardest of all. Talc is the softest substance. Can you think why diamond is used for cutting glass and grinding rocks? What about graphite?

#### **Subsection E.4 Minute to minute breakup of Period 4**

Discussion of previous period home task.	5 min	Teacher will discuss and check the list prepared by student that was assigned to them in previous period. Teacher will also encourage the lists made by students
Appearance	10 min	Materials usually look different from each other. Wood looks very different from iron. Iron appears different from copper or aluminum. At the same time There may be some similarities between iron, copper and aluminum that are not there in wood. Teacher will perform Activity 3 of NCERT text book. annexure GA2
Hardness	5 min	Q2: Select those objects from the following which shine: Glass bowl, plastic toy, steel spoon, cotton shirt
Solubility	5 min.	Some substances completely disappear when dissolved in water are called soluble substances while other which do not disappear are called insoluble.
Activity	10 min	Activity GA 4.1 and GA 4.2
Home task	5 mins	

**Annexure GA2** Performa for giving details about an activity

Annexure Name	GA2
Name of the activity	Sorting material on the basis of appearance
Type of the activity (individual activity/ group activity / home activity etc.)	Group activity
Objective	To make students aware about lustrous and dull objects
Material required for the activity	Paper,cardboard,wood,copper wire,aluminum sheet,chalk etc
Any specific preparations required in the class room for performing the activity	n.a.
Details of the activity and detailed instructions to carry it out	Collect small pieces of different materials like paper,cardboard,wood,aluminium sheet,chalk etc.Are these objects lustrous or dull?Also check whether freshly cut surface of these materials appear shiny?

Pictures describing the activity, if any	
Any precautions to be kept in mind	Be careful when you cut given materials
Explanation of the outcomes of the activity	Students will understand that materials which are lustrous are metals like iron, gold, aluminum etc which are not lustrous are dull.

#### Activity GA4.1

Identify and differentiate soluble from insoluble mixture of solids in liquid (water)

Let us perform some activities.

A) Take some test tubes and fill each one of them with 5 ml of water. Put common salt, chalk powder, washing powder, copper sulphate, Parle G (the brand may be Chocrea) biscuit crumbs, Cerelac powder, cellophane and iron nail in one test tube each. Observe which substances that dissolve in water and those that do not dissolve in water and make a list of both.

Solid substances, which dissolve in water, are called **soluble** substances and solid substances, which do not dissolve in water, are called insoluble substances.

B) Take a beaker or glass jar and pour measured quantity of water into it. Add 2 tablespoons of sugar into this water. Give it a stir. Take another beaker with the same amount of water. Add 2 tablespoons of sand into it. Give it a stir.

What happens in both the cases?

You observe that the sugar particles in the first beaker become smaller on stirring and then disappear into the water. Is this magic? Not really! We know that water is matter and matter is made of molecules. Water being a liquid has some intermolecular spaces. On stirring, the sugar gets within the spaces between water molecules. We say that sugar has dissolved in water.

Does the same happen when we stir water and sand?

No. we find that water, which is colourless slowly, becomes brownish with some sand suspended in it and some sand settled at the bottom. We say that sand cannot dissolve in water.

C) Take honey and water or lemon juice and water and try dissolving them or stirring them together. After some time you observe that, they become a solution. This is because both can dissolve in each other. Many solids, liquids and gases can dissolve in water.

#### Activity GA 4.2

**Aim:** Test solubility of different materials (liquid).

**Learning Outcome:** Identify and differentiate soluble from insoluble mixture of liquid.

Take test tubes filled with 5ml water in each. Add a small quantity of glycerine, kerosene oil, mustard oil, vinegar, alcohol and benzene. Stir the contents with a glass rod.

Observe the contents of each test tube and notice where the contents get dissolved and where they do not.


The liquids, which can dissolve in each other, are miscible liquids and those liquids, which cannot dissolve in each other, are immiscible liquids. We all have seen an aquarium. It has plants and animals with an aquatic habitat. These plants and animals can live comfortably in water. We are aware that plants being Autotrophs, they can prepare their own food, for which presence of carbon dioxide is one of the crucial components. Respiration needs oxygen. Both carbon dioxide and oxygen are gases. The occurrence of aquatic plants shows that these gases occur in water.


#### Subsection E.5: Minute to minute break up of period 5

Discussion of previous period home task.	5min	✓ Teacher will discuss the home task given in previous period.
Solubility	15 mins 10mins	Teacher will perform Activity 4 of NCERT text book. annexure GA3 Some substances completely disappear when dissolved in water are called soluble substances while other which do not disappear are called insoluble. Teacher will perform Activity 5 of NCERT text book. annexure GA4 Some liquids get completely mixed with water. Some others do not mix with water and form a separate layer when kept aside for sometime
Solubility of gases in water	5 min	Some gases are soluble in water like oxygen which are used by aquatic organisms.
Float/ Sink	10 min.	In the previous activity of solubility of liquids in water students have learnt that some liquids do not get mixed in water and they make a



Activity	20 min.	<p>separate layer in the container. Such substances are said to be floating on the surface of water. Some other substances that settles down at the bottom of water are said to be sink in water.</p> <p>Students will be given a ball, a stone, a piece of chalk, a plastic beaker, a cork etc. to dip in a tub filled with water to clarify the phenomenon of float/sink.</p> <p>Activity GA 5.1 and GA 5.2</p>
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Annexure Name	GA3
Name of the activity	Solubility of materials in water
objective	To enable students to understand about solubility of different materials in water
Type of the activity (individual activity/ group activity / home activity etc.)	Group
Material required for the activity	Sugar, salt, chalk powder, sand, saw dust
Any specific preparations required in the class room for performing the activity	-N.A-
<b>Details of the activity and detailed instructions to carry it out</b>	Teacher will ask the students to put the given materials one by one in water and check whether they disappear or not after stirring.
Pictures describing the activity, if any	
Explanation of the outcomes of the activity	Some substances completely disappear when dissolved in water are called soluble substances while other which do not disappear are called insoluble.

Annexure Name	GA4
Name of the activity	Solubility of liquids in water
objective	To enable students to understand about solubility of different liquids in water
Type of the activity ( individual activity/ group activity / home activity etc.)	Group
Material required for the activity	Vinegar,lemon juice,mustard oil,kerosene etc
Any specific preparations required in the class room for performing the activity	-N.A-
<b>Details of the activity and detailed instructions to carry it out</b>	Teacher will ask the students to put the given liquids one by one in water and check whether they mix in water or make separate layer.
Pictures describing the activity, if any	
Explanation of the outcomes of the activity	Some liquids get completely mixed with water. Some others do not mix with water and form a separate layer when kept aside for some time.

## Activity GA 5.1

Look at the objects listed in the table belowSteps:



1. Fill a sink, a bucket or a bath with water. Leave around 5cm empty.
2. Slowly lower one item into the water.
3. Remove the item from the water and test the next item.
4. Continue testing each item.
5. Now add a few of your own to see what happens.

**Remember:**

The floaters weigh less than the water they replace.

The sinkers weigh more than the water they replace.

**Observation Sheet**

Object	When you put it in water does it float or sink?
Marble 	
Coin 	

**2. DENSITY (FLOAT OR SINK)ACTIVITY-GA 5.2**

Material required :Cork, ball, Paper clip, Key, Rubber, pen, Aluminum foil, Candle

Look at the photograph of a boat.

Boat has been made by cutting a tree trunk. The low density of the wood allows it to float.

Let us know why some objects float and others sink.

By now we have observed that there are so many things around us. Some of these float in water, while others may not. So far we took this phenomenon casually. We have seen pictures of floating plastic wrappers in lakes and rivers. If we care to test the property of different materials that float in water, we may come across quite amazing facts. This information can give ideas to construct light weight objects, eg; life jackets, boats and ships.

Did you wonder how early man could build canoes and boats. He would have some idea about the property of floating. He may not have known the principle of floatation which you now know. Do you know the name of the man who discovered this principle?

His name is **Archimedes**. Let us watch a clip to know about his life and how he discovered the principle.

**Discuss Archimedes Experiment with the Golden Crown (to explain basic concept of floatation) see video clip**

**Archimedes Principle****A brief historical sketch of the discovery of the principle**

More than 2000 years ago, Archimedes, a Greek mathematician noticed that objects seem to weigh less when they were placed in water. This effect produced by liquid or gas causes objects to float. He discovered the Principle of Floatation.

The principle of Floatation states that an object immersed in a liquid receives an upward push thrust equal to the weight of the liquid it displaces. When an object is placed in water, the water exerts an upward force or the up thrust upon the object. This up thrust is the force produced by water in reaction to the force of the weight of the object that is introduced in water. This up thrust or the upward force is termed as Buoyancy. Water puts pressure from all sides of the object to support its weight. Remember the numerous paper boats, the soft plastic duck filled with air and that plastic mug you used to float in water while in the shower? How many of you enjoyed hitting a pool of the water with small pebbles? Where do these pebbles go?

Do they stay on the surface of water or do they sink into the puddle?

Take some soil in a glass and pour water over it. Leave it for some time. You will notice that the soil crumbs and stones settle at the bottom and the twigs, leaves, grass floats on the surface of water.

Why is it that some objects sink, while others float?

Try putting substances like a plastic ball, a cosco ball, a coin, candle wax, a piece of wood, rubber eraser, honey and an iron nail in water. Observe which one sinks and which one floats when put in water. The substances, which are lighter than water, tend to float, while those, which are heavier than water, sink.

You can now answer why ice always floats in your soft drink.

In this context relate the property of materials to the oil spill that occurred in Mumbai in 2010?


What happened during the recent oil spill in Mumbai?

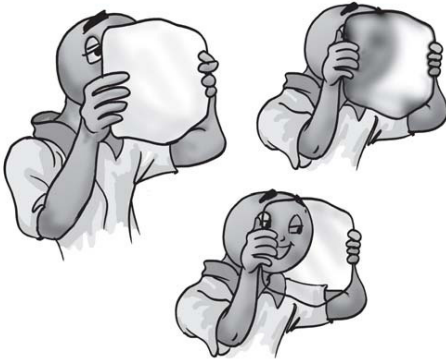
We are aware that other than economic wastage of a natural resource, it was a huge loss of aquatic life, both plants and animals. The oil formed a layer on the surface of water, blocking the supply of oxygen, creating hypoxia for the ocean life. If oil had been heavier than water, it would have settled down in the water.

In sewage treatment plants, the primary stage of physical treatment of water deals with skimming the light grease and oil off the surface of water and scraping the heavy sludge, which settles at the bottom.

#### **Sub Section E.6 minute to minute breaks up of period 6**

<b>Concept</b>	<b>Time</b>	<b>Indicative / guiding Script</b>
Discussion of previous period home task.	5 min	Teacher will discuss the home task given in previous period.
-Float/ sink in water Activity no. 6 will be discussed.	20min	In the previous activity of solubility of liquids in water students have learnt that some liquids do not get mixed in water and they make a separate layer in the container. Such substances are said to be floating on the surface of water. Some other substances that settle down at the bottom of water are said to be sink in water.

<p>Learning by exploration</p> <p>-Transparency</p> <p>Transparent,</p> <p>Translucent,</p> <p>Opaque</p> <p>Activity</p>		<p>Students will be given a ball, a stone, a piece of chalk, a plastic beaker, a cork etc. to dip in a tub filled with water to clarify the phenomenon of float/sink.</p> <p>Teacher will perform Activity 6 of NCERT text book. annexure GA5</p> <p>Teacher will show some objects like a piece of glass, a mirror, a tracing paper, book, eraser, plastic scale, metallic scale, table top, distilled water in a beaker, a card board, piece of cloth, polythene sheets of different colours etc. to the students and call the students to differentiate whether they can see through them or not.</p> <p>Teacher will explain the meaning of transparent, opaque and translucent object and write the definition of each one with examples.</p> <p>Shopkeepers usually prefer to keep biscuits, sweets and other eatables in transparent containers, so that buyers can easily see these</p>  <p>items.</p> <p>Teacher will also classify the objects mentioned in the preceding column with the help of students and write the same on the chalk board.</p> <p>Activity GA 6</p>
<p>Home task</p> <p>Scrap Book (Learning by doing)</p>	<p>5 min</p>	<ol style="list-style-type: none"> <li>1. Give some examples of materials that float in water.</li> <li>2. Give some examples of materials that sink in water.</li> <li>3. What do you mean by the term transparent, translucent and opaque? Give examples</li> <li>4. Prepare a scrap book in which paste the pictures of transparent, translucent and opaque objects.</li> </ol>

<b>Annexure Name</b>	<b>GA5</b>
Name of the activity	To differentiate between transparent and translucent objects
objective	1.To explain the concept transparent and translucent objects 2. Team work
Type of the activity (individual activity/ group activity / home activity etc.)	Group activity
Material required for the activity	Sheet of paper,oil,torch,dropper
Any specific preparations required in the class room for performing the activity	-N.A-
<b>Details of the activity and detailed instructions to carry it out</b>	Take a sheet of paper and look through it towards a lighted torch.We cannot see through it.Now put two three drops of oil and spread it on the paper and look through again the lighted torch,we can see through the oiled paper but not clearly.
Pictures describing the activity, if any	
Any precautions to be kept in mind	-N.A-
Explanation of the outcomes of the activity	<p><u>Transparent Object</u>- An object which allows light to pass through it is called transparent object. Ex- Glass, air, distilled water etc.</p> <p><u>Opaque Object</u> - An object which does not allow light to pass through it is called opaque object. Ex- card-board, book, wall etc.</p> <p><u>Translucent Object</u> - An object which allows light to pass through it partially is called translucent object.Ex.-Oiled paper,polythene etc.</p>

## Activity GA 6

Aim: To observe how materials differ in the property of visibility.

**Learning outcome:** Students will be able to recognize transparent, Translucent and opaque substances.

Take a plastic or glass tumbler and fill it with water. Keep a lighted candle on one side and try to see the flame through the tumbler from the other side. Now add some soil particles to this water and try observing the candle flame. Slowly increase the amount of soil so that a stage comes when the tumbler is almost packed with soil. Now try watching the candle flame through the tumbler. Clearly, it is easiest to watch the flame through clear water as it allows all the light to pass through it. Muddy water allows light to pass through it, but partially. Soil does not allow you to watch the flame through it as it doesn't allow any light to pass through it. Remember that light always travels in a straight path, following the property of rectilinear propagation of light. Materials through which light cannot pass at all are **opaque**. The property is referred to as opacity. Materials through which light passes partially are **translucent**. The property is referred to as translucency. Materials through which all the light can pass through completely are **transparent**. The property is referred to as transparency.

**The glass above is an example of a transparent object.**

**Transparent objects** are those which let the entire light pass through them. Most liquids are transparent. For e.g., water, alcohol, petrol etc. All gases for e.g. oxygen, nitrogen, carbon dioxide are transparent.

Subsection E.7: Minute to minute break up of period 7		
Discussion of previous period home task.	5 min	Teacher will discuss the home task given in previous period.
Activity /reinforcement in concept building.	10 min.	Teacher will divide the class into groups of 4-5 students each. <b>Place several objects on a table and ask the students to observe them carefully. Clear them that you have to go in another room and classify these objects on the basis of the following properties.</b> Appearance, Luster, Hard, Soft, Soluble, Insoluble, Float, Sink, Transparent, Translucent, Opaque
Recapitulation	15 min.	Activity GA 7.1 and GA 7.2
Demonstrating as to how to make a presentation	5 min	Teacher will tell that in period 8, one person from the group will be chosen independently to present the results and inferences. Teacher will brief the students about brief guidelines for presentation.(guidelines placed at annexure:GA6)



## Activity GA 7.1

**Activity:** Conduct a Quiz based on the Web link on "Who Wants To Be A Millionaire?"

[http://www.primaryresources.co.uk/science/powerpoint/materials\\_wwtbam\\_CW.ppt#257,1,primaryresources.co.uk](http://www.primaryresources.co.uk/science/powerpoint/materials_wwtbam_CW.ppt#257,1,primaryresources.co.uk)

Use of plastic is an environmentally sensitive issue. What is your view about the statement? Discuss situations where plastic has almost become unavoidable in life.

Organise a debate on SAY YES/ NO to plastics (TN).

Subsection E.8: Minute to minute break up of period 8														
Recapitulations	15mins	Teacher will repeat different properties of materials briefly to students.												
Keywords	15 min	Children will find out different keywords from chapter and same will be defined in English and Punjabi language giving examples												
Match the column	10 min	<p><b>Q3: Match the objects given below with the materials from which they could be made. Remember, an object could be made from more than one material and a given material could be used for making many objects.</b></p> <table><tr><th>Objects</th><th>Materials</th></tr><tr><td>Book</td><td>Glass</td></tr><tr><td>Tumbler</td><td>Wood</td></tr><tr><td>Chair</td><td>Paper</td></tr><tr><td>Toy</td><td>Leather</td></tr><tr><td>Shoes</td><td>Plastics</td></tr></table> <p>Students will match the above columns under the guidance of teacher.</p>	Objects	Materials	Book	Glass	Tumbler	Wood	Chair	Paper	Toy	Leather	Shoes	Plastics
Objects	Materials													
Book	Glass													
Tumbler	Wood													
Chair	Paper													
Toy	Leather													
Shoes	Plastics													
Home Task	5	Students will be asked to paste the pictures of some articles which are related to vocabulary in the same scrap book.												

<b>Subsection E.9 Minute to minute break up of period 9</b>
---

The following question answers of NCERT exercise will be discussed with students

**Q1: Name five objects which can be made from wood.**

Answer: Chair , Table, Plough, Bullock cart and its wheels and Door

**Q2: Select those objects from the following which shine:**

**Glass bowl, plastic toy, steel spoon, cotton shirt**

Answer: Objects which shine are: Glass bowl and steel spoon.

**Q3: State whether the statements given below are true or false.**

**(i) Stone is transparent, while glass is opaque.**

**(ii) A notebook has luster while eraser does not.**

**(iii) Chalk dissolves in water.**

**(iv) A piece of wood floats on water.**

**(v) Sugar does not dissolve in water.**

**(vi) Oil mixes with water.**

**(vii) Sand settles down in water.**

**(viii) Vinegar dissolves in water.**

Answer:

(i) Stone is transparent, while glass is opaque. ✗ (False)

(ii) A notebook has luster while eraser does not. ✗ (False)

(iii) Chalk dissolves in water. ✗ (False)

(iv) A piece of wood floats on water. ✓ (True)

(v) Sugar does not dissolve in water. ✗ (False)

(vi) Oil mixes with water. ✗ (False)

(vii) Sand settles down in water. ✓ (True)

(viii) Vinegar dissolves in water. ✓ (True)

**Q4: Given below are the names of some objects and materials:**

**Water, basket ball, orange, sugar, globe, apple and earthen pitcher**

**Group them as:**

**(a) Round shaped and other shapes**

**(b) Eatables and non eatables**

Answer:

(a) Round shaped and other shapes:

Round Shaped	Other Shapes
Basket Ball Orange Globe Earthen Pitcher	Water Apple Sugar

(b) Eatables and non eatables

Eatables	Non Eatables
Water, Orange, Sugar, Apple	Basket Ball Globe Earthen Pitcher

**Q5: List all items known to you that float on water. Check and see if they will float on an oil or kerosene.**

Answer: Paper strip, Balloon, Hair, plastic bottle, Wood, Boat etc. will float on water. A few of these like hair, balloon can float on kerosene or oil.

Generally, substances have less density than oil and water can float. For example, few types of wood have densities higher than oil but less than water, so it floats on water but not on kerosene.

**Q6: Find the odd one out from the following:**

**a) Chair, Bed, Table, Baby, Cupboard**

**b) Rose, Jasmine, Boat, Marigold, Lotus**

**c) Aluminium, Iron, Copper, Silver, Sand**

**d) Sugar, Salt, Sand, Copper sulphate**

Answer:

(a) Baby (rest are made up of wood).

(b) Boat (others are flowers)

(c) Sand (others are metals).

(d) Sand (others are soluble in water).

**Q7: How can materials be grouped together? In what ways do we classify materials?**

Answer: Different materials have different properties. Depending on the similar properties among different materials, these can be grouped together.

Different types of materials can be grouped based on the following properties they possess:

- Appearance,
- Solubility,
- Transparency,
- Conductivity
- Combustible - Easily burn or not.
- Attracts towards magnet

**Q8: Why do we classify materials in different groups?**

Answer: Different materials are grouped for the following reasons:

1. For our convenience. For example we can easily locate and identify them.
2. It helps us study their properties and identify common patterns among them.

**Q9: What do you call a substance through which things are partially visible?**

Answer: Translucent object.

**Q10: Name the materials that have fixed volume but not fixed shape.**

Answer: Liquids like water, oil etc.

**Q11: Roma has a bag full of apples. A few of these apples are rotten. How does Roma separate rotten apples from good ones?**

Answer: By looking and smelling them, Roma can identify rotten apples. Rotten ones look mushy and pulpy and smell bad.

**Q12: Is oiled paper transparent, translucent or opaque?**

Answer: Translucent.

**Q13: Give examples of transparent materials.**

Answer: Glass, water, air and some plastics.

**Q14: Why do shopkeepers prefer to keep biscuits, sweets and other eatables in transparent containers?**

Answer: Because buyers can easily see these items.

**Q.15 Select those objects from the following which shine: Glass bowl, plastic toy, steel spoon, cotton shirt**

S. No	Option	Shine(Yes/No)	
a.	Glass bowl.	<input type="checkbox"/> Yes <input type="checkbox"/> No	
b.	Plastic toy.	<input type="checkbox"/> Yes <input type="checkbox"/> No	
c.	Steel spoon.	<input type="checkbox"/> Yes <input type="checkbox"/> No	
d.	Cotton shirt.	<input type="checkbox"/> Yes <input type="checkbox"/> No	

## SECTION-F THE CONTENT

- 1) Objects around us
- 2) Objects of different shapes
- 3) Objects made up of different materials
- 4) Objects made of same material
- 5) Properties of material
  - a. Appearance
    - i. Lustrous
    - ii. Non-lustrous
  - b. Hardness
    - i. Hard
    - ii. Soft
  - c. Solubility
    - i. Soluble
    - ii. Insoluble
  - d. Float/sink in water
  - e. Transparency
    - i. Transparent
    - ii. Translucent
    - iii. Opaque

## Suggested Video Clips /Web Links / Powerpoints

### Title of weblink/videoclip/powerpoint

Video clip-1 <http://www.primaryresources.co.uk/topic/pwalsh/greenshirt.ppt#331,65,Slide65> warm up

Video clip-2 <http://www.primaryresources.co.uk/topic/pwalsh/chairtab.ppt#331,67,Slide67> uses of materials

Video clip-3 <http://www.primaryresources.co.uk/topic/pwalsh/tenbricks.ppt#265,1,Slide1> materials and their uses

Video clip-4 <http://www.youtube.com/watch?v=ek6CVVJk4OQ&feature=email>

Video clip -5 <http://www.attanolearn.com/excel/cbse-6th-science-sortingmaterials-into-groups.jsf>

Activity for sink or float and grouping of materials

Video clip-6 <http://www.youtube.com/watch?v=hIYdxQuzb60>

ACTIVITY Archimedes principle

Video clip-7 <http://www.youtube.com/watch?v=eQsmq3Hu9HA1>

ACTIVITY - why things float or sink explanation

Powerpoint-4 [http://www.primaryresources.co.uk/science/powerpoint/Materials\\_wwtbam.ppt](http://www.primaryresources.co.uk/science/powerpoint/Materials_wwtbam.ppt)

a. "Who Wants To Be A Millionaire?" QUIZ

## Section: H Model assessment tools for the students

Subsection: H1 Students will be assessed with the help of following multiple choice questions

1. The state of matter which has a definite volume but no definite shape

- a. Solid   b. Liquid   c. Gas   d. Mixture

2. Classification is grouping of

- a. Thing as living and non-living   b. All things living or non-living on the basis of their properties.  
c. Living things only   d. Non-living things only

3. Perfume is a substance which is

- a. Volatile   b. Non-volatile   c. Malleable   d. Sublime

4. If a substance can be beaten into thin sheet, it is called

- a. Ductile   b. Malleable   c. Brittle   d. Good conductor

5. Match the following columns

Column A

- a. Sugar
- b. Ghee
- c. Diamond
- d. Hydrogen sulphide
- e. Soluble

Column B

- i. Soft
- ii. Hard
- iii. Rotting egg smell
- v. Combustible liquid.

6. Fill in the blanks

- a. All metals are ----- of heat and electricity.
- b. Gold is -----.
- c. Petrol is -----in water.
- d. Copper is ----- magnetic material.
- e. Chalk does not ----- in water.

7. Define malleability and ductility?

8. Why do metal's objects lose their luster after a while?

9. How are transparent objects different from opaque objects?

10. Classify the following objects as metals, non-metal or compounds.

- a. Iron      b. Gold      c. Carbon      d. Sodium chloride      e. Oxygen      f. Sodium      g. Water      h. Sulphur.

11 Which of the following objects is transparent?

- A) Wall B) Windowpane      C) Cardboard D) All the above

12. Which of the following is soluble in water?

- a) Sugar      b) Sand c) Chalk powder      d) None of these

13. Which of the following objects is opaque?

- a) Wind screen b) Cellophane c) Polythene d) Cardboard

14 Complete the table

Object	Soluble	Insoluble	Transparent	Translucent	Opaque	Lustrous	Non-Lustrous	Hard	Soft	Float	Sink
Glass											
Iron											
Plastic ruler											
Sugar .....											

Subsection: H3 Students will be assessed on the basis of following HOT questions.

- Why could you not use a plastic towel?
  - It would be too bendy
  - It would not be absorbent
  - It would not conduct heat
- Why would you not sit on a glass chair?
  - It might shatter
  - It would not be absorbent
  - It would be transparent
- Metal is used for nails because it ....
  - Rusts
  - Is shiny
  - Does not bend easily
- Wood is used for matches because it...
  - Floats
  - Rots
  - Burns
- Rubber is used for making boots because it...
  - Floats
  - is opaque
  - is waterproof
- Which is the fastest way to dissolve a solid in a liquid?
  - Put a little solid in a lot of the liquid
  - Stir equal amounts of solid and liquid vigorously
  - Put lots of the solid in the liquid
  - Heat and stir the liquid and solid mixture
- Which of these can be described as 'soluble in water'?
  - Glass
  - Plastic
  - Sugar
  - Sand

8. MATCH THE FOLLOWING

Materials

1. Iron

Descriptions

a) for building



- |           |                             |
|-----------|-----------------------------|
| 2. Paper  | b) for drinking and cooking |
| 3. Silver | c) used for windows         |
| 4. Sand   | d) makes a good fire        |
| 5. Butter | e) hard and shiny           |
| 6. Glass  | f) goes well with bread     |
| 7. Wool   | g) from trees               |
| 8. Wood   | h) sinks in water           |

**9. ANSWER THE FOLLOWING QUESTIONS-**

- 1) What is classification?
- 2) What are materials?
- 3) Why is classification important in daily life?
- 4) What do you mean by miscible and immiscible substances? Give two examples.
- 5) What is solubility?
- 6) Is ink soluble in water?
- 7) Why does the sofa set needs to be soft?
- 8) Why does the floor need to be hard?
- 9) Would a hard ball be good for playing indoor games?

**Subsection: H4 Content taught to the students will be assessed on the basis of following tools:-**

1. In which solution, iron nail lose its shine and appear dull?

- |             |               |            |                |
|-------------|---------------|------------|----------------|
| a. Kerosene | b. Soft drink | c. Mustard | d. Coconut oil |
|-------------|---------------|------------|----------------|

2. Select the translucent materials from the following?

- |                  |           |                   |                 |
|------------------|-----------|-------------------|-----------------|
| a. Glass tumbler | b. Mirror | c. Aluminium foil | d. Muslin cloth |
|------------------|-----------|-------------------|-----------------|

3. Which among the following pair is commonly used for making safety pin?

- |                   |                      |                        |                      |
|-------------------|----------------------|------------------------|----------------------|
| a. Wood and glass | b. Plastic and glass | c. Leather and plastic | d. Steel and plastic |
|-------------------|----------------------|------------------------|----------------------|

4. Which type of material is used to make wind screen of a car?

- |                |                |           |                  |
|----------------|----------------|-----------|------------------|
| a. Transparent | b. Translucent | c. Opaque | d. All of these. |
|----------------|----------------|-----------|------------------|

5. Match the following objects with materials used to make.

Column A

- a. Note-book
- b. Table
- c. Shoes
- d. Toy
- e. Tumbler

Column B

- i. Glass
- ii. Leather
- iii. Plastics
- iv. Paper
- v. Wood

6. Select true (T) and False (F) statements from the followings.

- a. Sugar dissolves in water.
- b. Stone is translucent.
- c. Metals are lustrous.
- d. Piece of wood float in water
- e. Oil mix with water.

7. What are soft and hard materials? Give example.

8. On what basis materials are grouped together?

9. What is solubility? Give two example of each soluble and insoluble in water?

10. Select the five materials from the word box, which is opaque.

o	s	t	p	l	e
a	t	l	e	e	r
c	o	i	n	a	a
o	n	k	c	f	s
a	e	e	i	w	e
l	l	y	l	r	r

11. Which among the following materials are not lustrous?

- a. Diamond
- b. Gold
- c. Wood
- d. Silver

12. Select odd from the following

- a. Tawa                      b. Eraser                      c. Spade                      d. Pressure cooker

13. Choose the opaque materials from the following

- a. Clear water                      b. Thin sheet of plastic                      c. Wooden door                      d. Glass container.

14. Which pair of substance float in water

- a. Pin, oil drops                      b. Coin, rubber band                      c. Plastic ball, feather                      d. Thermocol, Cotton thread.

15. Match the following

Column A

Column B

- |             |                      |
|-------------|----------------------|
| a. Solid    | i. Copper            |
| b. Liquid   | ii. Air              |
| c. Gas      | iii. Copper sulphate |
| d. Element  | iv. Brick            |
| e. Compound | v. Water             |

16. Fill in the blanks with suitable word/ words.

- a. Making orderly arrangement of materials is called -----.
- b. Newspaper, a book, a copy, a diary are made up of -----.
- c. Substances that can burn easily are called -----.
- d. A substance that allow light to pass is called -----.
- e. ----- gas is highly combustible.

17. What are miscible and immiscible substances? Give example.

18. Write the expanded form of with uses.

- a. CNG
- b. LPG

19. What is volatility? Name some volatile substance.

20. Select the odd one out from the following and give reasons also.

- a. Table, chair, baby, bed, cupboard
- b. Rose, lotus, boat, jasmine
- c. Iron, copper, silver, sand
- d. Sugar, salt, copper sulphate, stone.

#### **SECTION: I ASSESSMENT TOOLS FOR TEACHER**

**Q.1** How will you clarify the concept of transparent, opaque and translucent objects to students?

**Q.2** What are different object you need to explain the phenomenon of solubility of materials in water?

**Q.3** How will you organize an activity to demonstrate the relation between property and uses of various materials?

**Q. 4** Give reasons for the following statements after analyzing them.

- a) The edible parts of both potato and sugarcane are same, yet they can be grouped into different categories on various bases.
- b) By studying the properties of a leaf from a monocot, we can get an idea about leaves of other monocots.(not forgetting that biology is a science full of exceptions)
- c) Various celestial objects have been classified as luminous and non - luminous.
- d) We use aluminium utensils and not paper utensils for cooking purposes.
- e) Tealeaves left on the filter are usually thrown, they may be used alternatively for our benefit.
- f) Brass is used to make items of decoration for our household.
- g)Copper and silver bangles turn green and black, respectively, after they are worn for many days.
- h) Metals have to be sandpapered from time to time.
- i) Ships sailing in salty seawater need to be regularly painted.
- j) Only diamond can cut another diamond.
- k) Iron, copper and aluminium are used to make factory equipments.
- l) A baby's skin should not be rubbed hard.
- m) Water turns sweet when sugar is stirred in it.
- n) It is not possible to dissolve more quantity of copper sulphate in water at the same temperature.
- o) Glycerine and water form a single layer together whereas glycerine and olive oil form two layers together.

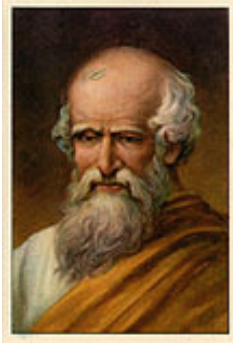
- p) Ice floats on water.
- q) Soda drinks should be consumed as soon as their bottle is opened or the bottle should be capped tightly after opening.
- r) Fishes should not be put in boiled water.
- s) We observe bubbles rising up on tilting an empty mug into a bucket of water.
- t) Shopkeepers keep biscuits in glass or plastic jars for display.
- u) It is difficult to drive on a misty or foggy day.
- v) Glass and water can lose their transparency.

**Q.5 Sort the following objects in different groups? Give reasons also.**

- (i) 50 yellow coloured T-shirts of same size of same company.
- (ii) Your kitchen having 10 packets of 1 L full cream milk of Amul (example of a brand) purchased from different shops.
- (iii) 100 pens of same shape but different colours of ink
- (iv) Paper napkins of same packet.
- (v) All news papers of March 2010 kept in your store room.

**Q.6 How can materials be classified on the basis of physical state?**

**Q.7 Discuss Archimedes Experiment with the Golden Crown (to explain basic concept of floatation)**



**A brief historical sketch of the discovery of the principle**

More than 2000 years ago, Archimedes, a Greek mathematician noticed that objects seem to weigh less when they were placed in water. This effect produced by liquid or gas causes objects to float. He discovered the Principle of Floatation. The principle of Floatation states that an object immersed in a liquid receives an upward push thrust equal to the weight of the liquid it displaces.

When an object is placed in water, the water exerts an upward force or the up thrust upon the object. This up thrust is the force produced by water in reaction to the force of the weight of the object that is introduced in water. This up thrust or the upward force is termed as Buoyancy. Water puts pressure from all sides of the object to support its weight.

**Sample projects**

1. Look at the bicycle carefully. Prepare a list of the different materials used to make it. Identify their property. Suggest alternative material to make the bicycle for you. Give reasons for it.

**Hints:**

The saddle is covered in **leather** or thin plastic because they are both smooth and flexible. Inside, the saddle is often filled with sponge because sponge can be compressed. The tyre needs to grip the road, be flexible and easily moulded so **rubber** is the best choice. The frame needs to be strong and rigid so we chose a **metal**. The metal we choose, depends on how much we want to pay. Cost of the material.

**2. The Umbrella Design Challenge.**

Ask students to design an umbrella to keep off the rain.

They must first brainstorm a list of possible materials they could make it from.  
They should then go through the list and decide why it would not be sensible to make an umbrella from some of the materials.

**3.Activity:** Conduct a Quiz based on the Web link on "**Who Wants To Be A Millionaire?**"

[http://www.primaryresources.co.uk/science/powerpoint/Materials\\_wwtbam.ppt](http://www.primaryresources.co.uk/science/powerpoint/Materials_wwtbam.ppt)

**4. Plan a demonstration or a PPT to find how floatation is related to :**

Gravity, Density, Temperature

**5Task:** Discuss your experience of a visit to the school library and the organization of the books in it.

### Rubric for Assessment of Learning

PARAMETERS	Beginning (1)	Approaching (2)	Meeting (3)	Exceeding (4)
Students can describe properties of materials using appropriate vocabulary				
Students can name materials with which they are familiar in their own environment				
Students can explain why materials have different uses.				
Students demonstrate and communicate their thinking through a range of classroom activities, for example drawings, art effects, actions, and concept mapping, as well as writing.				
Key words and how they are being used.				

