11 May 2020 Unit 5 Combining Materials

Below are interesting facts which can be used to answer the questions which will follow later.

Different materials can be combined to create new materials.

These new materials can even have different properties. For example iron rusts when it comes into contact with water and oxygen but when **carbon and chromium** is added/melted with iron it makes a new product called **stainless steel** which does not rust easily when it comes into contact with oxygen and water.

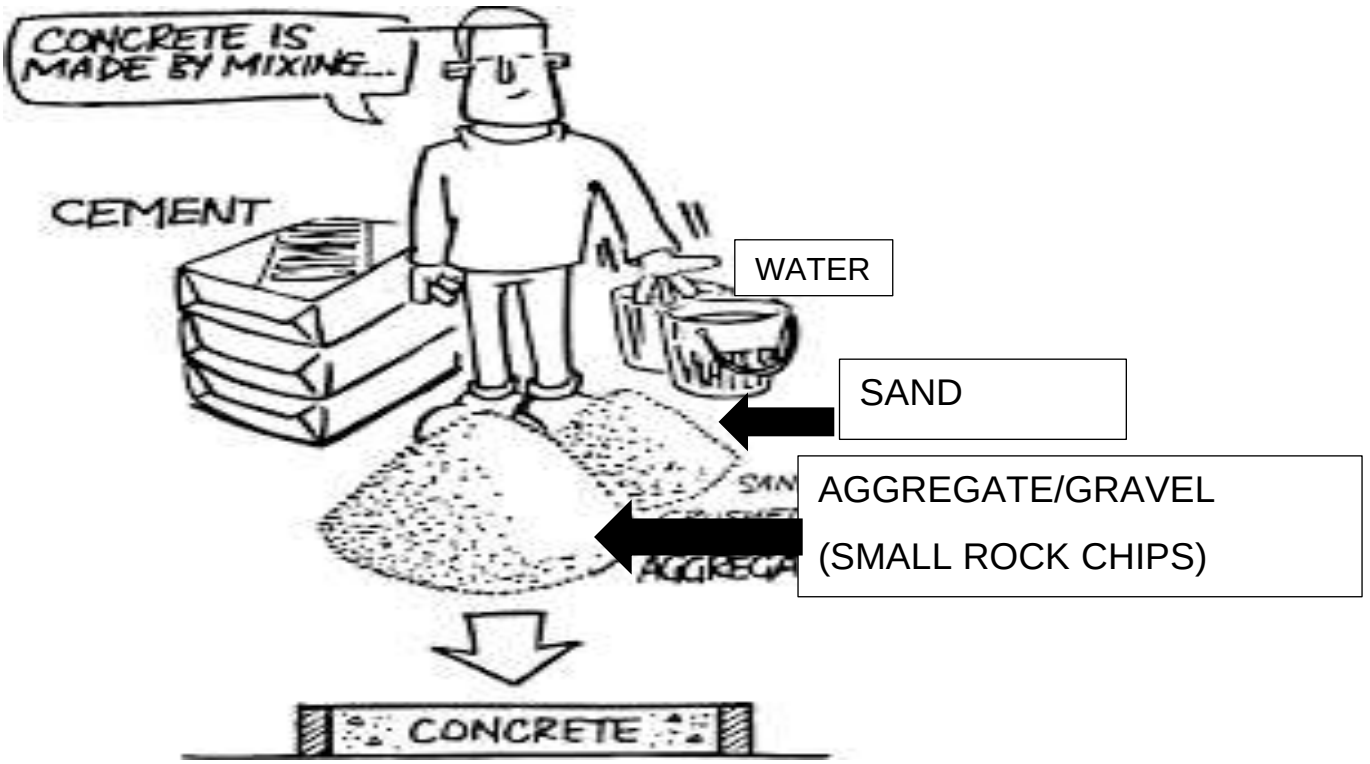
Stainless steel is also much stronger than iron and it shines more than iron.

To reinforce something means to make something (a structure or material) stronger. What do you think was added to iron to reinforce it?

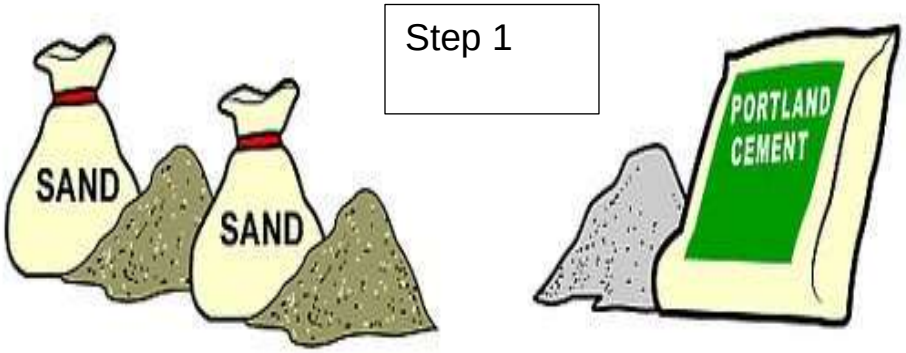
Chromium is a hard metal mined from the ground. Chromium is a chemical element with the symbol Cr. South Africa is the worlds largest producer of chromium.

Concrete is made by mixing sand, cement, gravel and water. The gravel is used to reinforce the concrete or make it stronger.

Below are a few illustrations of how concrete is made. Four different materials are mixed to make something totally new!



Step 1



2 : 1

STEP 2 , MIX THE SAND,SEMENT AND GRAVEL.

STEP 3 , MIX THE SAND,SEMENT AND GRAVEL AND ADD WATER , KEEP MIXING.THROW IT IN THE DESIRED SHAPE AND LET IT DRY.

wikiHow to Make Concrete

CONCRETE CAN BE SHAPED INTO BRICKS OR IT CAN BE USED AS A FLOOR (FOUNDATION) TO BUILD A HOUSE ON.

DAUB- A MIXTURE OF MUD OR CLAY AND GRASS USED FOR PLASTERING WALLS.The mud is shaped into bricks and left in the sun to dry or mixed with grass and packed into a wooden frame.The wood type Wattle is used for the frames of some traditional houses and then the mud is used as the daub. Wattle is also branches and interlaced(interwoven) twigs forming a structure.

<u>ABOVE AND BELOW IS A GOOD EXAMPLE OF HOW WATTLE AND DAUB WAS APPLIED.</u>

Questions

1. Which country is the biggest producer of Chromium?

2. How is stainless steel made?

3. What is the properties of stainless steel?

4. Stainless steel is much stronger than …… and also shines more than…….
5. What are the two main elements that must be added to iron to make stainless steel?

6. What are the four materials(elements) that must be mixed to make concrete?

7. What does it mean to reinforce something?

8. What is daub?

9. What is wattle & how is daub and wattle used together?

Optional fun home activities below.

Scientific investigation 5.2 Mixing materials to change their properties

60 minutes

You will need:

- a mixing bowl
- a tin can
- clay or mud
- grass
- water
- a stone.

Aim: To see if adding water and grass to clay makes stronger bricks

Method:

1. Working in pairs, collect some clay or mud.
2. Divide your clay into four pieces.
3. To the first piece, add enough water to make it runny. Leave it in the can and put it in the sun to dry.
4. To the second piece, add some water and grass. Mix it all together and shape it into a brick. Leave it in the sun to dry.
5. To the third piece, add grass and shape it into a brick. Leave it in the sun to dry.
6. Shape the last piece into a brick and leave it in the sun to dry.
7. Record in hours how long it takes for each brick to dry completely.
8. When the bricks are all completely dry, test to see which one is stronger by scraping each surface with a stone.
9. Which one is softer? Why?
10. Which brick took the longest to dry? Why?
11. A material was used to reinforce two of the bricks. What was that material? What does 'reinforce' mean?
12. If you were building a house, which brick would you choose to use and why?

Scientific investigation 5.4 Adding vinegar to bicarbonate of soda

20 minutes

You will need:

- one beaker (glass)
- 10 ml of white vinegar
- 1 teaspoon of bicarbonate of soda.

Aim: To observe the changes when vinegar is added to bicarbonate of soda

Method:

1. Measure and pour 10 ml of vinegar into your beaker.
2. Add the bicarbonate of soda.

Observation:

1. In your exercise book, write a sentence describing what the vinegar and bicarbonate of soda look and smell like.
2. Copy the table below into your exercise book. Observe the **reaction** and record your results in the table.

	Vinegar	Bicarbonate of soda	During reaction	Final product
Colour				
Solid or liquid or gas				
Smell				
Other observations				

Scientific investigation 5.3 Making play dough

30 minutes

Before you start, write a sentence in your exercise book describing the appearance and smell of each of the ingredients, starting with baking flour.

You will need:

- a spoon
- a mixing bowl
- baking flour
- water
- salt
- cooking oil
- food colouring.

Aim: To observe the changes when you add flour to water

Method:

1. Mix 2 cups of flour to 1 cup of salt.
2. Add 1 tablespoon of oil and 1 cup of water and the food colouring to the salt and flour mixture.
3. Once you have mixed all of the liquids, tip your dough onto a flat surface and knead the mixture. Add more water if necessary.

Observations:

1. Write a sentence describing what your dough looks like.
2. Does your play dough look like or have the same properties as the ingredients you used to make it? Why?