

# Week 4

## Lesson 7 sheets 1

Year 5

### 16 Can mixing materials change them?

- Mixing some materials can produce new materials.
- Your observations will tell you if something new has been made.

How can you spot if new materials are being formed? There are many signs! A changing colour, a new smell, bubbles and substances getting warm all show that a chemical change is taking place. These changes are not usually reversible.

#### What can water do when mixed with some materials?

Mixing materials with water sometimes produces irreversible or chemical changes. This means that you cannot get back what you started with.



A hard solid is made from cement powder and water. This change is irreversible.



Plaster of Paris and water also make a hard solid. This change is reversible.

#### What can acids do when they are mixed with some materials?

Mixing some materials with an acid, such as vinegar or lemon juice, can also produce irreversible changes.

Mixing lemon juice with washing soda produces bubbles or carbon dioxide. This is one of the new materials made. You cannot get the original materials back.



#### Chemical change

A process in which materials react and form new substances.

#### Acids

Materials with a sour taste that react with some others to form carbon dioxide gas.

# Sheet 2



## On track

- 1 Leopard class have mixed some materials together. Their observations are in this table. However, they have been mixed up.

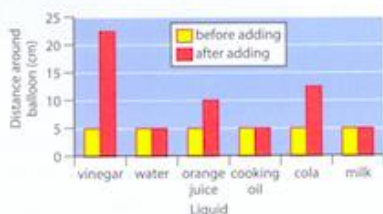
What is mixed	Observation
plaster of paris and water	bubbles of gas come off.
vinegar and water	a hard, grey solid is formed.
cement and water	they just mix.
orange juice and washing soda	a hard, white solid is formed.

- (a) Copy the table out. Match the correct observation to the mixture by drawing a straight line between them.  
 (b) Which ones are irreversible changes? How did you decide?



## Aiming higher

- 2 Mr Hills shows his class a bottle with a balloon attached. Inside the bottle is some vinegar. He adds the bicarbonate of soda in the balloon to the vinegar. The balloon inflates. He shows them a graph. This displays how much the balloon inflates when different liquids are added. Use it to answer the questions.



- (a) Which three liquids reacted to produce a gas. How would you know there was a reaction?  
 (b) What do you think the three liquids chosen in part a have in common?  
 (c) Describe how the height of the bars on the chart shows which balloons inflate.



## How well am I doing?

### On track

I can explain what a chemical change is.

### Aiming higher

I can explain some signs of chemical changes.

# Lesson 8

## Sheet 1

Year 5

### 17 What new materials have chemists made?

- Chemical reactions can make useful new materials.
- Many new materials have had or could have a big impact on our lives.

One hundred years or so ago we had to use materials that were only found in nature. Imagine a life without plastics, modern medicines, artificial fibres and alloys. In the 20th century there was an explosion in the number of new materials that were invented. New materials with unique properties are still being made today.

#### How can chemists change our everyday lives?

**Spencer Silver (1968):** One of the inventors of low-tack adhesive. This allows notes to be easily attached and removed without leaving marks or residue.

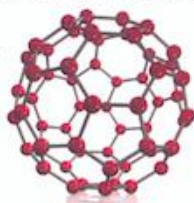


**Ruth Benerito (1950s):** Invented wrinkle-free cotton. Clothes made out of this material could be 'washed and worn'. This changed the fabric industry and made cotton a very desirable fabric.



#### What new materials have been invented recently?

**Harry Kroto (1985):** One of the inventors of Buckminsterfullerene. This has a unique arrangement of 60 carbon atoms. It helps treat cancer.



#### Chemist

A scientist who makes new materials out of the elements.

**Kostya Novoselov and Andre Geim (2003):** Discovered graphene. Carbon atoms are arranged in layers, one atom thick. It is an amazing electrical conductor.



#### Alloys

Mixtures of metals that have better properties than the metals they are made from.



# Sheet 2



## On track

- 1 Use the Internet to find out which of these materials occur naturally and which have been made by chemists.

cement	superglue	gold	plaster of Paris	polythene
diamond	graphene	wrinkle-free cotton	granite	low-tack adhesives



## Aiming higher

- 2 Leopard class have done some research on chemicals that have changed our lives.

Material	Discoverer/inventor	Significance
Aspirin	Felix Hoffman (1897)	Used as a pain killer and for the treatment of heart disease
Bakelite	Leo Hendrik Baekeland (1907)	One of the first plastics
Penicillin	Alexander Fleming (1928)	A widely used antibiotic
Nylon	Wallace Carothers (1935)	One of the most commercially successful plastics
Halothane	Charles Suckling (1951)	A widely used general anaesthetic
Aspartame	Monsanto Chemicals (1965)	The most widely used artificial sweetener

- (a) Draw a timeline showing the development of these new materials and their uses.  
(b) Use the Internet to add a few more, from the past and modern times.



## How well am I doing?

### On track

I can name some famous chemists and the materials they invented.

### Aiming higher

I can name some new materials that have had a big impact on everyday life.