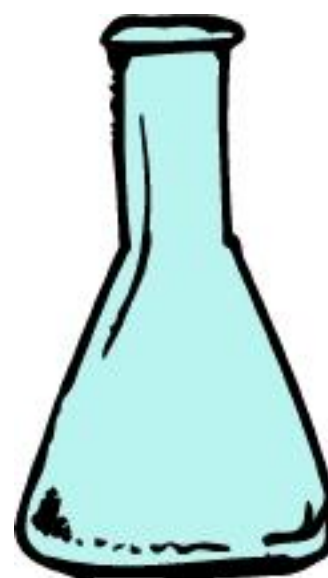
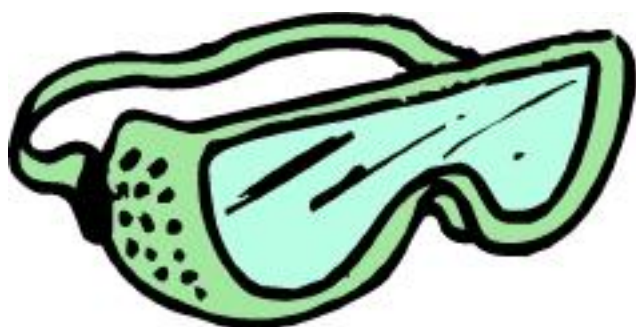


Task Booklet  
Year 7 Science

# Materials and Reactions



Student Name:  
Science Teacher:

**Chemical Opposites**

**Core**

1. Decide whether the following acids are safe or hazardous. Fill your answers into the blank table.

| <b>sold as...</b>     | <b>acid contained</b> | <b>safe or hazardous?</b> |
|-----------------------|-----------------------|---------------------------|
| lemonade              | citric acid           |                           |
| industrial grade acid | hydrochloric acid     |                           |
| lemons                | ascorbic acid         |                           |
| baking powder         | tartaric acid         |                           |
| apples                | malic acid            |                           |
| metal etching acid    | nitric acid           |                           |
| soured cream          | lactic acid           |                           |
| rhubarb               | oxalic acid           |                           |
| metal polish          | phosphoric acid       |                           |

2. Draw lines below to match each acid to its use.

prevents scurvy for sailors

phosphoric acid

used in baking powder

citric acid

used for cleaning metals

tartaric acid

used to make lemonade

lime juice

**Standard**

3

Decide whether the following statements are true or false and circle the correct answer:

- |  |       |
|--|-------|
| (a) All acids taste sour                           | T / F |
| (b) All acids are dangerous                        | T / F |
| (c) Acids will attack metals                       | T / F |
| (d) Acids are the only dangerous chemicals         | T / F |
| (e) The warning symbol for corrosive is a cross    | T / F |
| (f) Our stomach uses acids to help break down food | T / F |
| (g) Car battery acid is very dangerous             | T / F |
| (h) Lemonade tastes sour because of the acid       | T / F |



**Salt and Water**

**Core**

To complete question 4 a piece of universal indicator paper is required.

1 (a) What is meant by the term 'neutralisation'?

\_\_\_\_\_

(b) What do we mean when we say the pH of a neutral solution is 7?

\_\_\_\_\_

(c) How can you test to see if a solution is neutral?

\_\_\_\_\_

(d) What two substances can be mixed to neutralise each other?

\_\_\_\_\_

(e) What two 'new' substances are made in a neutralisation reaction?

\_\_\_\_\_

(f) What material is used to remove the indicator from a neutralised solution? Explain how it works.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

(g) If the neutralised solution is left to evaporate, what will be seen to form?

\_\_\_\_\_

**Standard**

2. Complete the following neutralisation reaction equations by filling in the blanks.

(a) sodium hydroxide + hydrochloric acid  $\rightarrow$  sodium chloride + \_\_\_\_\_

(b) sodium \_\_\_\_\_ + hydrochloric acid  $\rightarrow$  sodium chloride + water

(c) potassium hydroxide + hydrochloric acid  $\rightarrow$  potassium \_\_\_\_\_ + water

(d) \_\_\_\_\_ hydroxide + hydrochloric acid  $\rightarrow$  potassium chloride + water

(e) magnesium hydroxide + hydrochloric acid  $\rightarrow$  \_\_\_\_\_ chloride + water

continued  $\rightarrow$



**Safety with Acids**

**Standard**

1. Look at the chemical labels. Explain what precautions you would take when using these chemicals. Use the hazard labels key and fill your answers into the table.



| Key   | Precautions |
|---|-------------|
| <p><b>Toxic</b><br/>These substances can cause death. They may have their effect when swallowed, breathed in or absorbed through the skin</p>   |             |
| <p><b>Harmful</b><br/>This symbol may be shown with a 'h' meaning harmful (similar to toxic but less dangerous) or an T meaning irritant (not corrosive but can cause reddening of the skin, itching or blisters)</p> |             |
| <p><b>Corrosive</b><br/>These substances attack and destroy living tissues including the eyes and skin</p>  |             |
| <p><b>Oxidising</b><br/>These substances provide oxygen so that other substances burn more fiercely</p>   |             |
| <p><b>Flammable</b><br/>These substances catch fire easily and often burn fiercely</p>  |             |

2. You are not likely to see the radioactivity symbol on substances you use. Why not?

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**Are pH balanced products better for your skin?**

Core

This is an exercise to help you plan investigations.



Many skin care products advertise the fact that they are 'pH balanced' or match our skin pH of 5.5. Are these products really better for us, or is it just an advertising trick to get us to buy more expensive products?

This is a scientific question because it can be investigated in an experiment.

It is not easy to plan this sort of investigation because

- it uses people rather than test tubes and other apparatus
- the results would take a long time to gather
- it is difficult to make it a fair test

The questions on this sheet will help you to think about how you could set up a fair test. You won't actually carry out the experiment.

1. Would it be fair to test the product on only one person?  
Explain your answer.

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2. How many people would you need to have in your sample to make sure that you have enough to make it a fair test?

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**Standard**

3. Would age or gender (male or female) be important?  
How would you choose a good scientific sample of people to be involved?

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4. Would everyone in the sample group try the pH balanced soap? Why?

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5. How would you tell if one soap was better than the other?  
Would it be good enough to rely on what the people in the sample told you? What could you measure?

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6. How do adverts try to show that the products (e.g. anti dandruff shampoo) work? Could you use a similar method?

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**Extension**

7. Would it matter if some people in the sample group thought that the pH balanced products were better before they did the experiment? Why?

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**A Nice Change**

**Standard**

1. Classify the changes in this list as chemical or physical changes.

- (a) butter melting \_\_\_\_\_.
- (b) an egg cooking \_\_\_\_\_.
- (c) a puddle evaporating \_\_\_\_\_.
- (d) wax solidifying \_\_\_\_\_.
- (e) a gas flame burning \_\_\_\_\_.
- (f) fountain pen ink drying \_\_\_\_\_.
- (g) breathing \_\_\_\_\_.
- (h) making molten (melted) glass \_\_\_\_\_.

2. Here is a list of instructions for cooking chips.

- 1 peel potatoes
- 2 cut potatoes into chips
- 3 turn on the gas
- 4 strike a match
- 5 light the gas
- 6 heat the frying oil
- 7 cook the chips
- 8 strain the fat away
- 9 add salt and vinegar

Put the number for each instruction into the correct column of the table.

| <b>physical change</b> | <b>chemical change</b> |
|------------------------|------------------------|
|                        |                        |

Standard

A **permanent** change is when the material stays changes after cooling.

A **temporary** change is when the material goes back to what it looked like before.

3. Read the descriptions below and decide whether the change is permanent or temporary.

(a) Candle wax is white. It can be melted in boiling water to make a clear liquid. When it cools the liquid changes into a white, waxy solid.

Permanent or Temporary? \_\_\_\_\_

(b) If bits of wood are heated where the air cannot get to them they do not burn. After heating the wood has become a black crumbly solid called charcoal.

Permanent or Temporary? \_\_\_\_\_

(c) Lead oxide is a red powder used in paint to prevent rust. If it is heated in a test tube the colour gets darker until it is nearly black. When you stop heating it gets lighter and ends up red.

Permanent or Temporary? \_\_\_\_\_

(d) Petrol is a yellowish liquid. If you mix it with air and heat it strongly you get a blue flame and lots of heat. When it cools no trace of the liquid can be found.

Permanent or Temporary? \_\_\_\_\_

(e) Sugar is white crystals. If it is heated in a saucepan it smells of toffee. Gentle heating turns it into a dark solid called caramel.

Permanent or Temporary? \_\_\_\_\_

(f) Explain your answer to question (e).

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**Fire**

**Core**

1. Use the words in the box to fill in the gaps in the passage below.

**chemical   back   combines   permanent   wood   physical  
new   steam   cold   water**

When water boils \_\_\_\_\_ rises from the surface. When steam comes into contact with a \_\_\_\_\_ surface, such as a window pane, it turns \_\_\_\_\_ into \_\_\_\_\_ again. This is an easily reversible change so it is a \_\_\_\_\_ change. When wood is burned it \_\_\_\_\_ with oxygen in the air to make \_\_\_\_\_ substances. It would be difficult to make these new substances back into \_\_\_\_\_ again so this is a \_\_\_\_\_ change. We call a permanent change a \_\_\_\_\_ change.

**Standard**

2. Doors often have a spring loaded closing device on them so that the door closes after someone has passed through it. These are known as fire doors. How do they slow down the speed of movement of a fire through a building?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

3. At school we have to have fire practice. Give two rules for a fire practice and say why it is important that people follow these rules.

a) \_\_\_\_\_  
\_\_\_\_\_  
b) \_\_\_\_\_  
\_\_\_\_\_

