

Name:
Science Class:
Teacher:
Hand in day:

Y8 Science

Term 1: Homework Booklet

Chemistry

	Hand in Date	Parents Signature
Acids and Alkalis		
Homework 1		
Homework 2		
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Homework 4		
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Acids and Alkalis Homework 1:

Comprehension Task

If you look around your kitchen you may find some acids to eat or drink. Citrus fruits such as lemons and oranges contain citric acid. Vinegar used to pickle foods and flavour chips contains ethanoic acid. Fizzy drinks contain carbonic acid. Acids tend to taste sour.

Acids also have industrial uses and are found in car batteries and used to make fertilisers and explosives. These tend to be more dangerous acids like sulfuric acid, H_2SO_4 and nitric acid, HNO_3 .

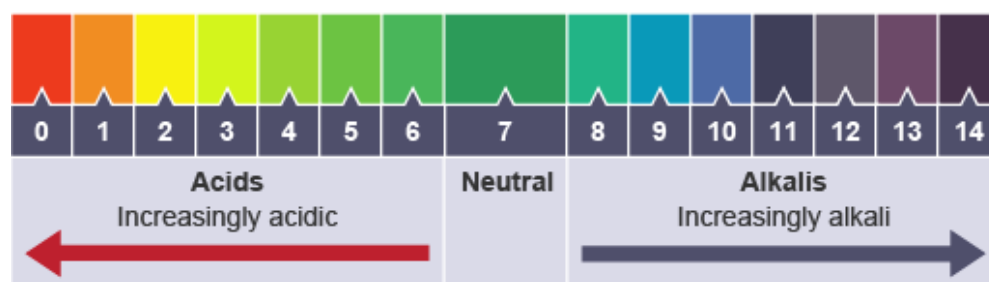
Acids can be dangerous when they are concentrated because they can be corrosive. This means that they can destroy skin and attack metals if spilled. Dilute acids, mixed with a lot of water, are much safer but they can still be an irritant. Irritants may cause a rash or reddening of the skin if spilled.

Alkalis have many uses as cleaning products, and are found in products like bleach, oven cleaner and washing powder. They are also found in toiletries such as soap, shampoo and toothpaste. Magnesium hydroxide is a safe alkali used to treat acid indigestion.

Many alkalis can also be dangerous, like sodium hydroxide NaOH , and potassium hydroxide KOH . They can also be corrosive. More dilute alkalis can also be an irritant. Alkalis also feel soapy to touch and can be difficult to wash from the skin.

Acids and alkalis are not easy to identify by sight, as they all look like colourless solutions when dissolved in water. We must use indicators to identify them. Indicators change colour in acids and alkalis. Most indicators only have 2 colours, one colour in acids, and a different colour in alkalis.

Universal indicator is a special indicator which goes lots of different colours depending on how strong or weak the acid or alkali is. Each colour matches a number on the pH scale from 0 up to 14.



pH 7 in the middle of the scale means neutral (neither an acid or an alkali) like water.

Numbers less than 7 mean acids, numbers above 7 mean alkalis.

The further away from pH 7 a substance is, the more dangerous it will be.

Questions

1. What sort of fruits contain citric acid?
2. What is the name of the acid in vinegar?
3. What is the chemical formula of sulfuric acid?
4. What does the word corrosive mean?
5. What does the word irritant mean?
6. What sort of products often contain alkalis?
7. What is magnesium hydroxide used for?
8. What do indicators do in acids and alkalis?
9. What pH number means neutral?
10. What do numbers less than pH 7 on the scale mean?

Acids and Alkalis Homework 2:

Learn the spellings of the following key words and their meanings.

Acid: An acid is a substance that has a pH lower than 7.

For example, hydrochloric acid, sulfuric acid, citric acid, ethanoic acid (vinegar)

Base: A base is a substance that neutralises an acid – those that dissolve in water are called alkalis

Alkali: An alkali is a soluble substance with a pH higher than 7.

For example, sodium hydroxide (used to make soap), potassium hydroxide, oven cleaner, toothpaste, shampoo

Hazard: A hazard is something that can cause harm



Corrosive

(the substance can attack metals, stoneware and skin)



Toxic

(the substance is poisonous)



Irritant

(the substance is not corrosive but can still hurt you)

Concentration: Concentration is a measure of the number of acid particles in a given volume of water

Neutral: Neutral solutions have a pH of 7. For example, pure water

Neutralisation: A reaction in which an acid reacts with an alkali or a base to produce a salt and water

You will have a short test on this revision in class

Acids and Alkalis Homework 3:

Use your knowledge organiser to complete the table below, showing what colour these substances would appear in universal indicator and litmus paper.

Substance	pH	Colour in universal indicator	Colour using red litmus paper	Colour using blue litmus paper
Lemon Juice		Yellow		
Baking soda	9			
Battery acid		Red		
Water	7			

Find the chemical formulae of the following acids and alkalis. You will need to use the internet to search for the answers. eg. 'Chemical formulae of phosphoric acid'.

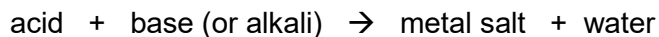
You will need to be able to recognise and name the acids and alkalis from their chemical formulae.

Substance	pH	Chemical formulae
Phosphoric acid	1	H ₃ PO ₄
Hydrochloric acid	1	
Sulfuric acid	1	
Nitric acid	1	
Sodium hydroxide	14	
Potassium hydroxide	14	
Copper Oxide	N/A	

Acids and alkalis Homework 4:

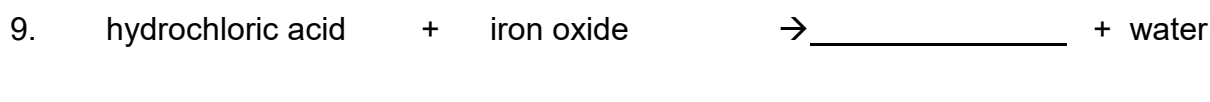
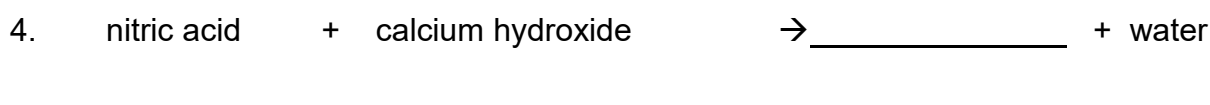
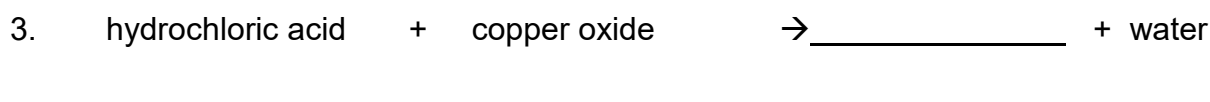
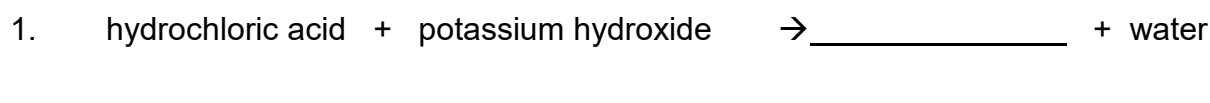
Complete the equations below by filling in the gaps.

Acids react with alkalis to make a salt and water.



(where the name of the salt depends on the acid used – see knowledge organiser)

eg. hydrochloric acid + sodium hydroxide $\rightarrow$ sodium chloride + water



Acids and alkalis Homework 5:

Answer the following question in as much detail as possible.

A student plans a method to prepare pure crystals of **copper sulfate**.

The student's method is:

1. Add one spatula of calcium oxide to dilute hydrochloric acid in a beaker.
2. When it has dissolved, heat the solution with a Bunsen burner until all the liquid is gone.

The method contains several errors and does not produce copper sulfate crystals.

Explain the improvements the student should make to the method so that pure crystals of copper sulfate are produced.

Before you answer, think about the following....

- *Did the student use the correct chemicals (if not, what should they have used?)*
- *Did the student know that all the acid had been neutralised?*
- *Would the method give the student nice, big, pure crystals?*

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