


# Lesson 1

Lesson	Resources	Context
1	A variety of substances for tasting e.g. lemon juice, sherber, vinegar, sugar, water, cold tea, gaviscon, bicarbonate of soda	Identify that acids taste sour

# Starter – Responding to feedback

Your exercise book has been marked  
You will have received the following marks

 Indicative Grade

 for effort      5 is excellent  
1 needs improving

 for presentation

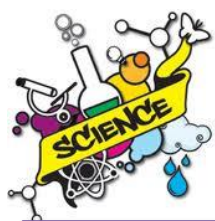
## TASKS

- 1) Read all comments and marks
- 2) Look for the EBI questions and ANSWER/RESPOND to them
- 3) Write out any spellings correctly x3

## Marking For Literacy codes

V Inaccurate/ unsatisfactory vocabulary choice – choose another word	
S Spelling error here	G Grammar error here
? Express this more clearly; explain	// Start a new paragraph
eg Give an example here	^ Add a word, a paragraph, a topic
* An amendment or addition later in the writing	√ Relevant, interesting comment, well done
! I am shocked!	P Punctuation error here





# Title: What are acids and alkalis?

## Homework: Learn keywords for spelling test

Level	Learning Objectives	Key Words	SPAG
All	<b>Identify</b> some acids and alkalis and describe how acids taste.	Acid Alkali Sour	• To be able to spell all keywords
Most	<b>List</b> some acids and alkalis and <b>explain</b> why some are dangerous and others are not.	Corrosive Caustic	
Some	<b>Suggest</b> how alkalis can be used as medicine.	Neutralisation	



# Main Activity - Task

	Activity	Expectations
All	Out of the pictures below can you identify anything that is hazardous?	Write down your answer in your book.
+	Can you group them into acid and alkalis?	Write them down under the heading acid and alkali.



Acid



Acid



Alkali



Acid



Alkali



Alkali



Acid



Acid



# Main Activity – Modelling what you need to do

Acids taste sour and they contain **H<sup>+</sup> ions**.

Acids can be weak or strong. Strong acids are said to be corrosive.



Everyday acids are weak acids.



Laboratory acids are strong acids.

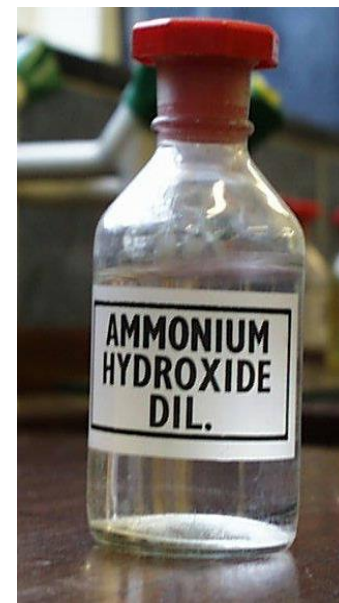
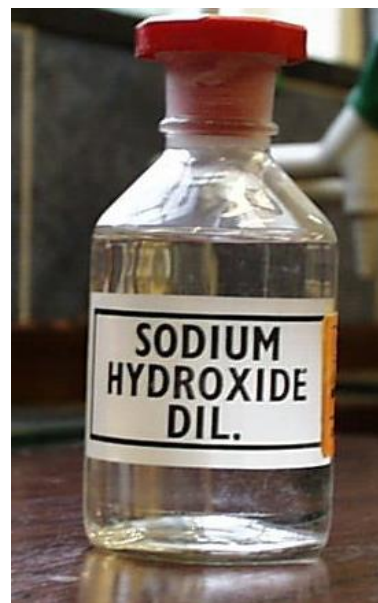
# Main Activity – Modelling what you need to do

Alkalis are soluble bases and the opposite of acids and they contain **OH<sup>-</sup> ions**.

Alkalis can be weak or strong. Strong alkalis are said to be caustic.



Everyday alkalis are weak alkalis and they feel soapy.



Laboratory alkalis are strong alkalis.

# Main Activity – Task



Support: Acids usually have a sour taste.



**All**  
Taste the range of products, **identify** them as acid, alkali or neither and describe how acids taste.

**Most**  
Taste the range of products and **explain** why these products are safe to taste yet some other acids and alkalis are not.



**Some**  
Taste the range of products and **explain** how you can help with acid indigestion using Gaviscon.

# Scales 1-10

Think	Think about what we have discussed so far/the question.
Share	Hold up the number of fingers that relates to how confident you are in your understanding. 1 being unconfident and 10 being totally confident.





# Assessment Phase

Level	Assessment Task	Expectations
All	<b>Identify</b> some acids and alkalis and describe how acids taste.	Write down how the acids tasted and write down some simple everyday acids and alkalis.
Most	<b>List</b> some acids and alkalis and <b>explain</b> why some are dangerous and others are not.	Give some examples why acids and alkalis should be handled with care and explain why.
Some	<b>Suggest</b> how alkalis can be used as medicine.	I expect you to suggest how Gaviscon might work to help with acid indigestion.





**Write two separate statements on your learning and progress this lesson.**

**Use the sentence starters to help you.**

## **www**

The lesson went well because I learnt how to...

I now feel more confident when...

I understand how to...

This lesson I have practiced...

## **ebi**

I now need to learn how to...

I will feel more confident when I can...

I will practice at home using...

I need to practice explaining clearly how...

### **Keywords:**

Acids, alkalis, taste, corrosive,  
Caustic, sour



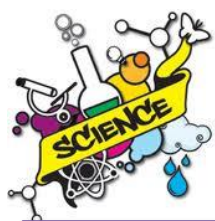
# Lesson 2

Lesson	Resources	Context
1	<p data-bbox="469 801 1275 936">Starter equipment as per video <a href="http://chemistry.about.com/video/How-to-Turn-Water-Into-Wine.htm">http://chemistry.about.com/video/How-to-Turn-Water-Into-Wine.htm</a></p> <p data-bbox="469 1003 1251 1193">A variety of substances for testing e.g. lemon juice, sherbet, vinegar, distilled water, solution of alkali seltzer, hydrochloric acid, sodium hydroxide and Universal indicator, spotting tiles, pH scales</p>	<p data-bbox="1294 801 1761 882">Identify acids and alkalis using universal indicator</p>



	Activity	Expectations
All	Watch the demonstration. What happened?	Write down your answer in your book.
	Can you explain	Write down your answer in your book.

The wine glass contained a few drops of an **sodium hydroxide**. The water had a few drops of the **indicator** phenolphthalein in it. When the water was poured in the colour changed as the **indicator** identified an **alkali**. When the 'wine' was then poured into the water glass which contained a few drops of **hydrochloric acid** it went colourless as the **indicator** detected an **acid**.



# Title: Identifying Acids and Alkalis

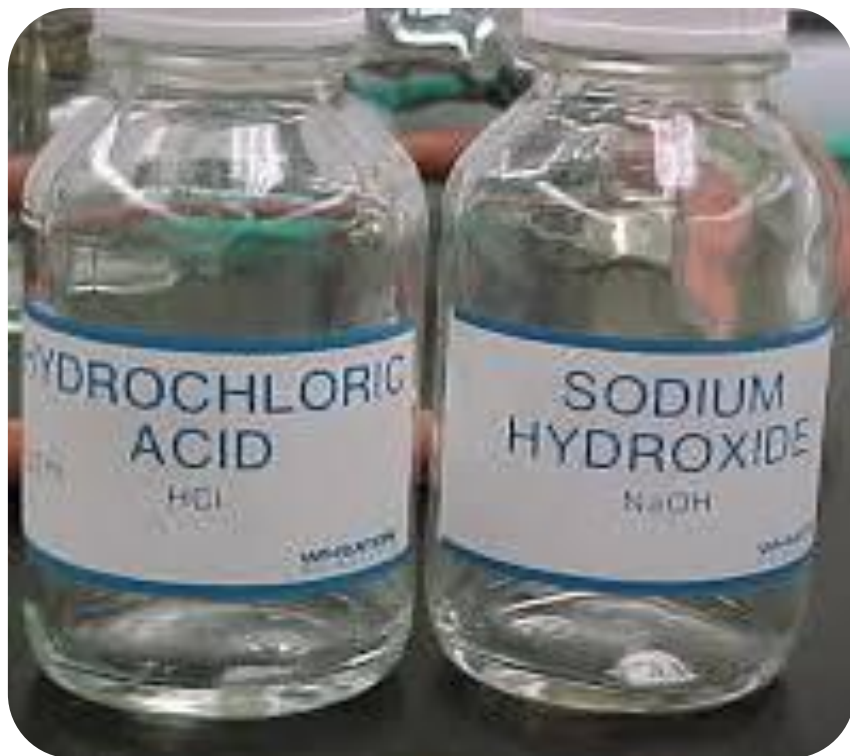
## Homework:

Level	Learning Objectives	Key Words	SPAG
All	<b>Identify</b> some acids and alkalis using Universal Indicator.	Universal Indicator	<ul style="list-style-type: none"><li>To be able to use the terminology correctly when explaining ideas</li></ul>
Most	<b>Describe</b> how the pH scale shows the strengths of acids and alkalis.	pH Scale	
Some	<b>Predict</b> if a substance is an acid or alkali based on pH data.	Neutralisation	



# Main Activity – Modelling

Do acids and alkalis look different? How can we tell them apart, other than labelling the bottles?



We can tell whether something is an acid or an alkali by using an indicator.

**An indicator is a dye that turns a different colour depending on whether it comes into contact with an acid or an alkali.**



It INDICATES which type of substance it is.



# Main Activity – Modelling

Think

What could all these things have in common? They are all

They are all types of indicator!

Pair

Discuss parts

Share

Share your thoughts.



Cherries and their juice are red in an acidic solution, but turn blue to purple in an alkaline solution.



Universal Indicator

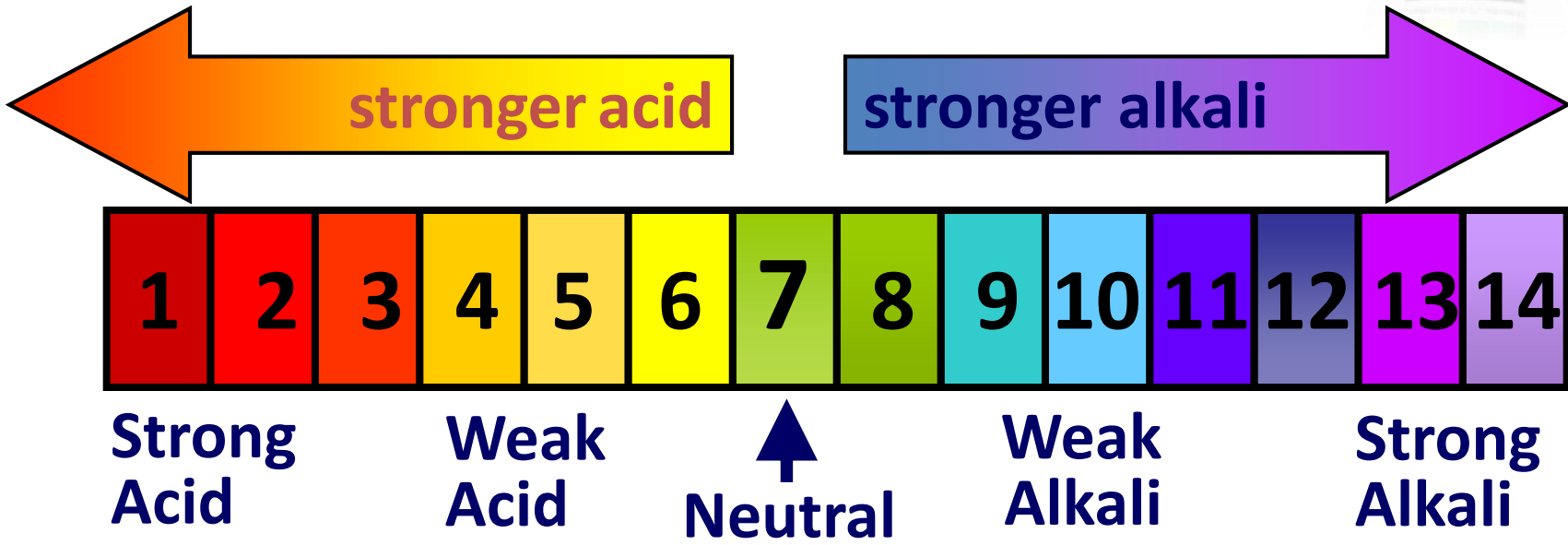
Blue grapes contain a monoglucoside of malvinidin which changes from deep red in an acidic solution to violet in an alkaline solution.

Geranium Petals contain the anthocyanin pelargonin, which changes from orange-red in an acidic solution to blue in an alkaline solution.



# Main Activity – Modelling

Universal indicator is a mixture of dyes which can produce a range of different colours depending on the strength of the acid or alkali being tested. We measure the strength of an acid or alkali using the pH scale:





# Main Activity – Task

## Method:

- 1) Using a pipette transfer a few drops of the test substance into a spotting tile.
- 2) Add a drop of Universal Indicator.
- 3) Record your results.



Substance	Colour	pH	Acid/Alkali/Neutral



## Most

Test the range of products, **identify** them as acid, alkali or neutral and **state** the strongest alkali and acid, giving reasons for your choices.



## Some

Test the range of products, **identify** them as acid, alkali or neutral and **suggest** how pH data can be used in real life.

## All

Test the range of substances and **identify** them as acid, alkali or neutral.

# Main Activity – Results

Substance	Colour	pH	Acid/Alkali/Neutral
Distilled water			
Hydrochloric acid			
Sodium hydroxide			
Lemon juice			
Sherbet			
Vinegar			
Alka Seltzer			
Baking powder			



Gardeners test soil pH to determine the best plants to grow. Soils can be neutralised using alkalis if they are too acidic.

**All**  
Test the range of substances and **identify** them as acid, alkali or neutral.



**Most**  
Test the range of products, **identify** them as acid, alkali or neutral and **state** the strongest alkali and acid, giving reasons for your choices.



**Some**  
Test the range of products, **identify** them as acid, alkali or neutral and **suggest** how pH data can be used in real life.

# Main Activity - AfL

	Activity
All	Would these be safe to drink?
+	How could identify differences in the solutions?



# Assessment Phase

Level	Assessment Task	Expectations
All	<b>Identify</b> some acids and alkalis using Universal Indicator.	1) (i) Red, (ii) Blue, (iii) Orange, (iv) Purple
Most	<b>Describe</b> how the pH scale shows the strengths of acids and alkalis.	2) (a) Acidic, Alkaline, Alkaline, Acidic, (b) Oven cleaner
Some	<b>Predict</b> if a substance is an acid or alkali based on pH data.	3) (a) C, (b) (i) A & D, (ii) B & E, (c) Neutralisation



Once you have marked your partners work, give them a score as a percentage.



# Plenary

Think about the following then when asked hold up your planner cards to show your answers:

	Acid	Alkali	Neutral
Substance turned red using Universal Indicator...	Y		
Pure water would be...			Y
Sodium hydroxide is...		Y	
A solution of pH 5 would be...	Y		
Acidic soil can be neutralised using this...		Y	



# Lesson 3

Lesson	Resources	Context
3	Red cabbage indicator practical as per slide 22 and 23	Making indicators to identify acids and alkalis

# Starter – Spelling Quiz

Quickly take your seat and spend these few minutes to review the keywords for a quick spelling quiz!

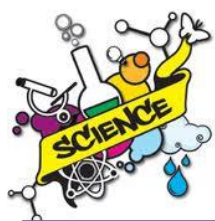


# Starter – Spelling Quiz

1. Acid
2. Toxic
3. Sour
4. Corrosive
5. Hazard
6. Alkali
7. Harmful
8. Concentrated
9. Indicator
10. Caustic







# Title: Indicators

## Homework: Acids and Alkalis Sheet

Level	Learning Objectives	Key Words	SPAG
All	<b>Carry out a practical</b> to make an indicator using red cabbage <b>safely</b> .	Acid Alkali Indicator Litmus Hazard	<ul style="list-style-type: none"><li>To be able to spell all keywords</li></ul>
Most	<b>Carry out a practical</b> to make an indicator using red cabbage safely and <b>produce a risk assessment</b> .		
Some	<b>Carry out a practical</b> to make an indicator using red cabbage safely and <b>evaluate the method</b> , suggesting any appropriate changes.		



# Main Activity – Modelling

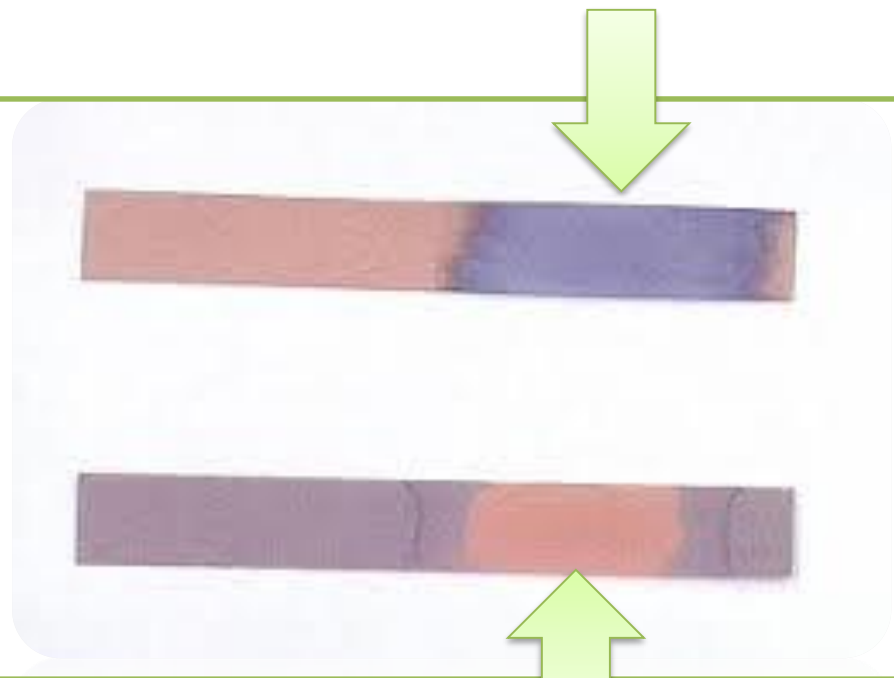
Last lesson we learnt that there are many different indicators.



Another indicator we use in the laboratory is litmus paper.

# Main Activity – Modelling

Red litmus paper goes blue in the presence of an alkali.



Blue litmus paper goes red in the presence of an acid.

# Main Activity – Task

Name of Solution	Effect on BLUE litmus paper	Effect on RED litmus paper
Orange Juice	Turns red	No effect
Sodium hydroxide	No effect	Turns blue
Distilled water	No effect	No effect
Soap solution	No effect	Turns blue
Vinegar	Turns red	No effect
Hydrochloric acid	Turns red	No effect

Think	What are the missing results?
Pair	Discuss your ideas with you partner.
Share	Share with the class what you think.

## Support:

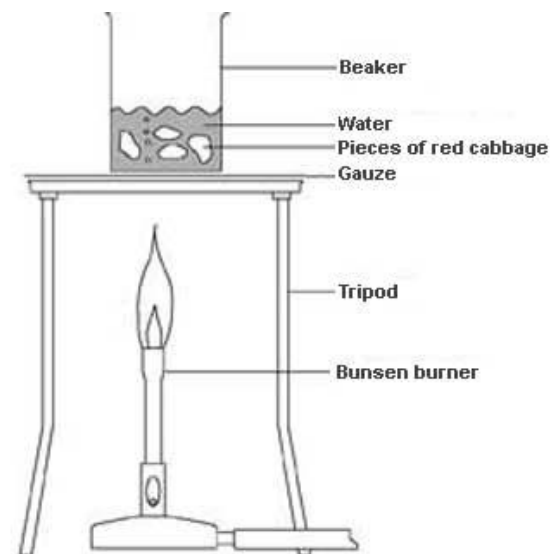
Red litmus paper goes blue in the presence of an alkali.  
Blue litmus paper goes red in the presence of an acid.



# Main Activity – Task/Assessment

1. Set up equipment as shown in the diagram.
2. Boil 50cm<sup>3</sup> of water in a beaker.
3. Add 3 or 4 small (5 cm) pieces of red cabbage to the boiling water.
4. Continue to boil the red cabbage in the water for about 5 minutes. The water should turn blue or green.
5. Turn off the Bunsen burner and allow the beaker to cool for a few minutes.
6. Filter the beaker to remove excess leaves and collect your cabbage indicator solution.
7. Place 3 test-tubes in a test-tube rack. Half-fill one of the test-tubes with acid, one with alkali, and one with distilled water.
8. Use a pipette to add a few drops of the cabbage indicator solution to each test-tube.

## Making indicator using red cabbage.

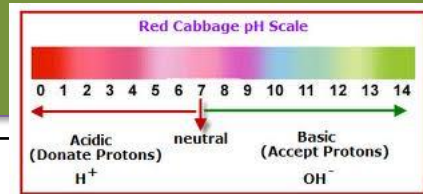


Substance	Colour of red cabbage indicator



Lesson Focus: Willingness to participate

# Assessment Phase



Level	Assessment Task	Expectations									
All	Carry out a practical to make an indicator using red cabbage safely.	Red cabbage when boiled can be used to make an Indicator. This indicator turns Red in the presence of an acid ( $H^+$ ions) and Green in the presence of an alkali ( $OH^-$ ions).									
Most	Carry out a practical to make an indicator using red cabbage safely and produce a risk assessment.	<table border="1"> <thead> <tr> <th>Hazard</th> <th>Risk</th> <th>Control</th> </tr> </thead> <tbody> <tr> <td>e.g. Flame</td> <td>Burn</td> <td>Tie hair back, don't touch flame</td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Hazard	Risk	Control	e.g. Flame	Burn	Tie hair back, don't touch flame			
Hazard	Risk	Control									
e.g. Flame	Burn	Tie hair back, don't touch flame									
Some	Carry out a practical to make an indicator using red cabbage safely and evaluate the method, suggesting any appropriate changes.	To improved the quality of my indicator, I could have.....									



# Lesson 4

Lesson	Resources	Context
4	Squash and water to dilute for starter  Rainbow fizz practical equipment and worksheet per student	Concentrated and dilute

# Starter Title: Concentrated or dilute?

## Watch the demonstration

	Activity	Expectations
All	What is the difference between concentrated and dilute acids?	Concentrated acids are dangerous they contain more acid particles and are usually corrosive. Dilute acids are watered down and are not so corrosive.
+	How would you know whether an acid is concentrated or dilute?	You could use an indicator to find out how concentrated an acid is.







# Title: Concentrated or dilute?



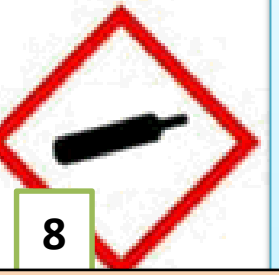

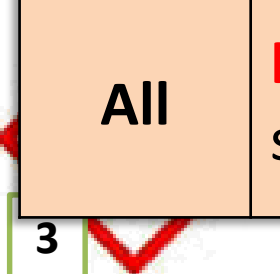
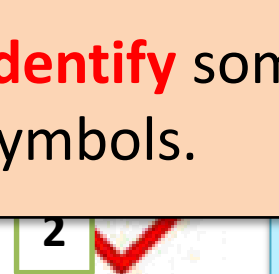




## Homework:

Level	Learning Objectives	Key Words	SPAG
All	<b>Identify</b> some hazard symbols and <b>recognise</b> some acids are more dangerous than others.	Corrosive Caustic Irritant Harmful Toxic Concentrated Dilute	<ul style="list-style-type: none"><li>To be able to construct compound sentences using connectives</li></ul>
Most	<b>Describe</b> the difference between concentrated and dilute acids and alkalis.		
Some	<b>Interpret</b> particle diagrams and <b>relate</b> to concentration of acids and alkalis.		



# Main Activity – Modelling what you need to do

So that we know which chemicals are safe and which are dangerous, there is a set of signs called the Hazchem System. These symbols are put on containers and explain why the chemical is dangerous.

 4	 5	 8	<ul style="list-style-type: none"><li>1) Irritant and take caution</li><li>2) Flammable</li><li>3) Explosive</li></ul>	<b>Think</b> Can you match up the signs with their meanings?	
 6	 3	 2	<p><b>All</b> <b>Identify</b> some hazard symbols. </p>		Discuss your ideas with you partner.
 1	 7	 9	<ul style="list-style-type: none"><li>7) Oxidizing</li><li>8) Compressed gas</li><li>9) Long term health hazard</li></ul>		<b>Share</b> Share with the class what you think.



# Main Activity – Modelling what you need to do

## Concentrated and Dilute

In a concentrated acid, there are more acid particles. The more water that is mixed with the acid, the less concentrated it becomes and it becomes dilute. Concentrated substances are more hazardous!

All

**Recognise** some acids are more dangerous than others.



Most

**Describe** the difference between concentrated and dilute acids and alkalis.



boil and splash!!

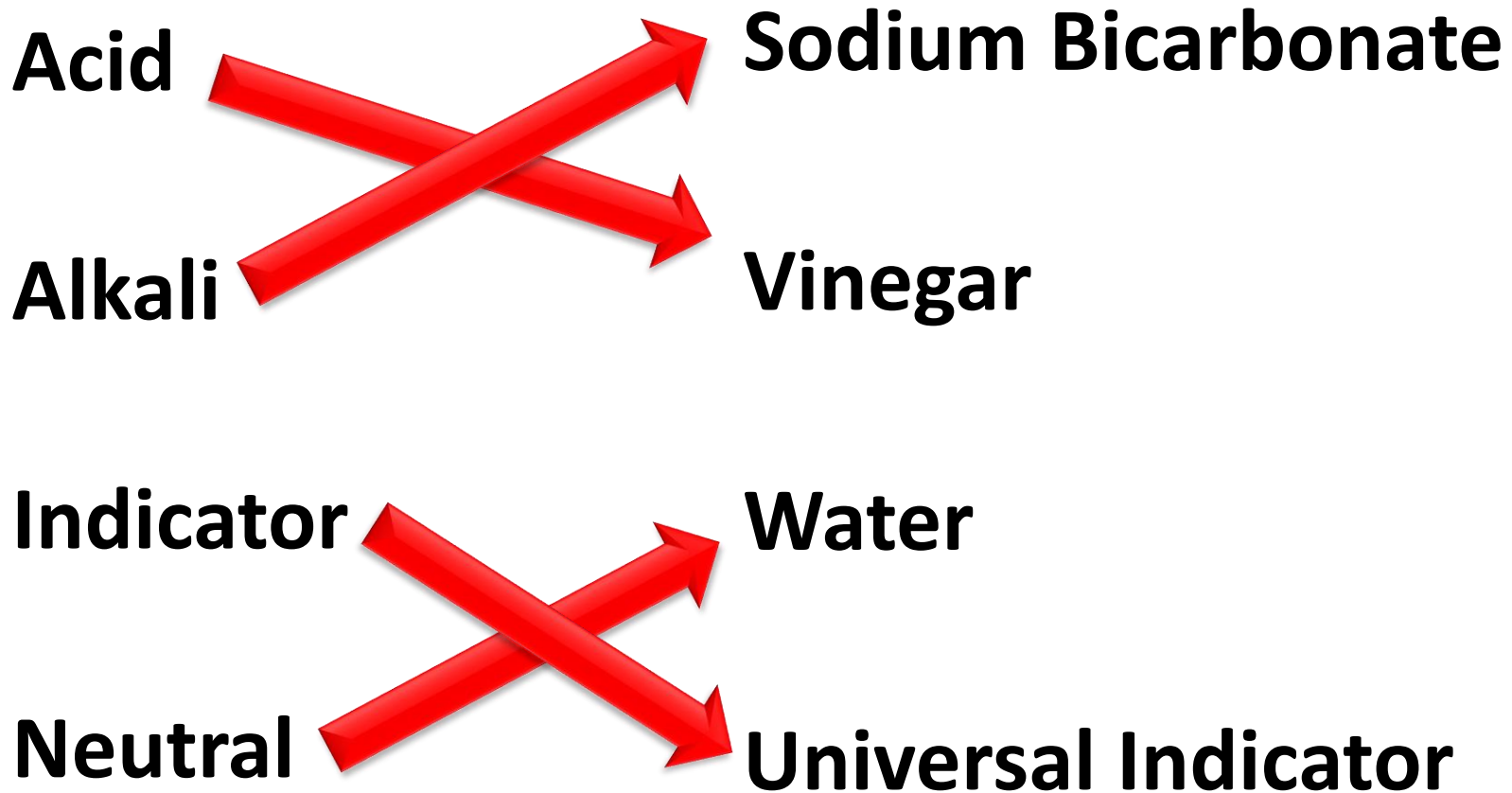
Concentrated solution: More solute particles per unit volume

Dilute solution: Fewer solute particles per unit volume



# Main Activity – Modelling what you need to do

Match these up...



# Main Activity – Modelling what you need to do

Our experiment...



**Sodium Bicarbonate**

**Baking Powder**

**Water**

**Ethanoic Acid**

**Vinegar**

**Universal Indicator**



Lesson Focus: Develop concern for others

# Main Activity – Task

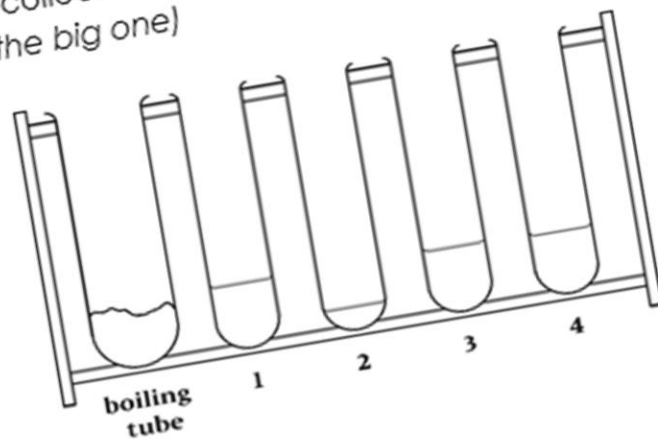
Follow the method on the worksheet and answer the questions at each stage.



Wear goggles

## How Fizz - Creating a pH Scale in a Test Tube

collect a test tube rack with 4 test tubes and a boiling tube. (The boiling tube is the big one)



What is in each one?

Boiling Tube \_\_\_\_\_

Tube 1 \_\_\_\_\_

Tube 2 \_\_\_\_\_

Tube 3 \_\_\_\_\_

Tube 4 \_\_\_\_\_

### Instructions

1. Now pour tube 1 in to the boiling tube.

Feel the boiling tube, shake it, what do you notice?

"When I added the water to the sodium bicarbonate I not

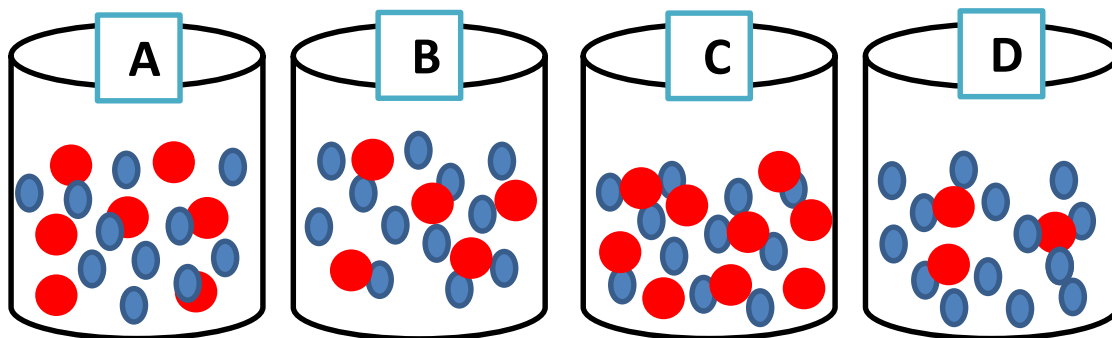


Lesson Focus: Develop concern for others

# Assessment Phase



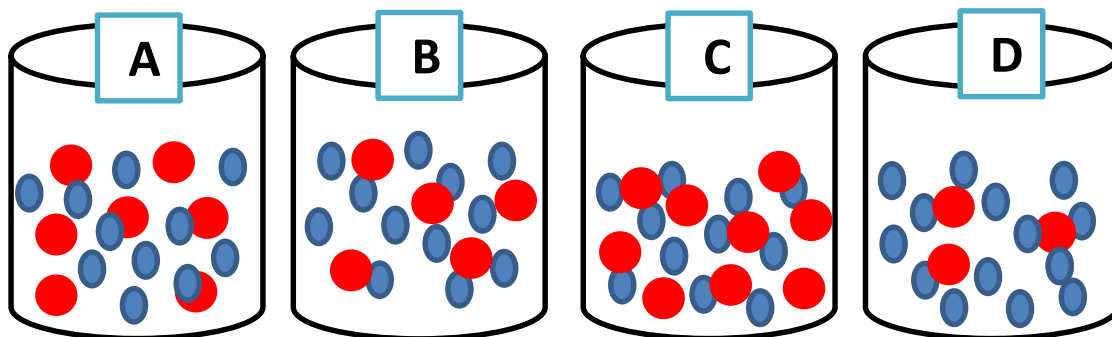
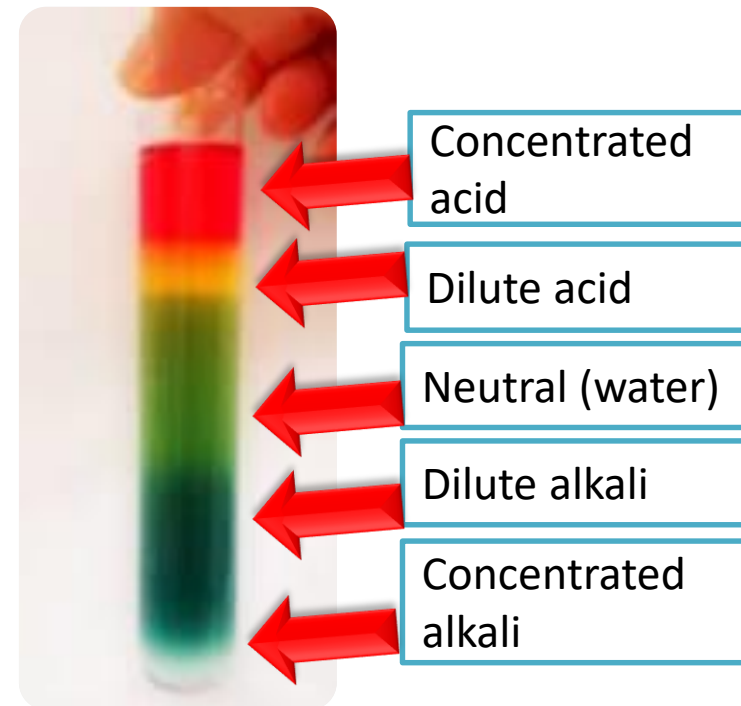
Level	Assessment Task	Expectations
All	<b>Identify</b> some hazard symbols and <b>recognise</b> some acids are more dangerous than others.	Identify the symbols shown and give an example of dangerous and safe acid.
Most	<b>Describe</b> the difference between concentrated and dilute acids and alkalis.	Describe the results of your practical and identify where the concentration of acids and alkalis was the highest.
Some	<b>Interpret</b> particle diagrams and <b>relate</b> to concentration of acids and alkalis. ● = acid	Look at the beakers of acids below, list them in the order of the most concentrated? Explain how you know this.



# Peer Assessment



Level	ANSWERS
All	Toxic, corrosive, irritant and take caution. Dangerous – hydrochloric acid, safe – ethanoic acid (vinegar).
Most	See diagram.
Some	C~A~B~D, there are the most acid particles in C. ● = acid





# Plenary

	Activity
All	Rank the hazard symbols in order of harmfulness. Work in pairs.
+	Write down a sentence or two explaining your decision and share with the class



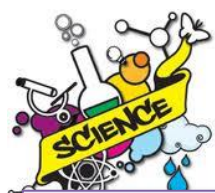
# Lesson 5

Lesson	Resources	Context
5	<b>BOOK a computer room or book laptops</b> Poster paper Worksheet on everyday acids and alkalis What am I plenary worksheet	Uses of acids and alkalis

# Starter Title: Uses of acids and alkalis

	Activity	Expectations
All	List some every day acids and alkalis.	Write down some examples in your book.
+	How are acids and alkalis useful in every day situations?	Write down some examples in your book.





# Title: Uses of acids and alkalis

**Homework: Learn the definitions of the keywords.**

Level	Learning Objectives	Key Words	SPAG
All	Give examples of how acids and alkalis are used in a range of everyday situations, using the worksheet provided.	<b>Acid</b> <b>Alkali</b>	<ul style="list-style-type: none"><li>To be able to construct compound sentences using connectives</li></ul>
Most	Use different sources to find information on where acids and alkalis are used in everyday situations in nature and manmade products.		
Some	Select and reference appropriate information about uses and effects of acids and alkalis and explain how are acids and alkalis manufactured.		



**Lesson Focus: Develop curiosity about differences**

# Main Activity – Task/Assessment

You are going to produce a poster on how and where acids are used in every day situations. You need to consider where acids and alkalis are used in nature, at home, at school, at work and by businesses.



A good poster will include:

- a title
- diagrams and pictures
- information in your own words
- uses of acids in nature
- uses of acids in manmade products
- uses of alkalis in nature
- uses of alkalis in manmade products
- how acids and alkalis are manufactured
- interesting facts about acids and alkalis

You are going to use a variety of sources to produce your poster and the aim of this lesson is to get you comfortable with extracting useful information and interpreting it. **IT IS NOT A CUT/COPY AND PASTE EXERCISE!!!** Level 6/7 students also need to reference their information in a bibliography.



# Peer Assessment

The poster should include the following...

Level	Assessment Task	Expectations
All	Give examples of how acids and alkalis are used in a range of everyday situations, using the sources provided.	<b>Given some examples of acids and alkalis being used in everyday situations. This should include natural and man made and some pictures.</b>
Most	Use different sources to find information on where acids and alkalis are used in everyday situations in nature and manmade products.	<b>Used a variety of sources to find detailed information on where acids and alkalis are used in every day situations. This should include manmade and natural with pictures.</b>
Some	Select and reference appropriate information about uses and effects of acids and alkalis and explain how are acids and alkalis manufactured.	<b>Used a variety of sources, which are reference using a bibliography, to find detailed information on where acids and alkalis are used in every day situations. Your poster should included how acids and alkalis are manufactured.</b>



Lesson Focus: Develop curiosity about diff

# Plenary

Lesson 5 | Acids and Alkalis - Plenary

## Acids and Alkalis - What am I?

1. I am a chemical with a pH of 1. What am I? \_\_\_\_\_
2. I am a chemical with a pH of 14. What am I? \_\_\_\_\_
3. I am a chemical with a pH of 5. What am I? \_\_\_\_\_
4. I am a chemical with a pH of 8. What am I? \_\_\_\_\_
5. I am a chemical with a pH of 7. What am I? \_\_\_\_\_
6. I am the green liquid used to determine if a chemical is \_\_\_\_\_  
I? \_\_\_\_\_
7. I am the type of paper used to determine if a chemical is \_\_\_\_\_  
What am I? \_\_\_\_\_
8. I am vinegar. Am I an acid or an alkali? \_\_\_\_\_
9. I am soap. Am I an acid or an alkali? \_\_\_\_\_
10. I taste sour. Am I an acid or an alkali? \_\_\_\_\_
11. You must always wear me when working with acids and alkalis.  
What am I? \_\_\_\_\_
12. I am the scale on which we measure the strength of acids and alkalis.  
What am I? \_\_\_\_\_

1. Acid
2. Alkali
3. Acid
4. Alkali
5. Neutral
6. Universal Indicator
7. Litmus
8. Acid
9. Alkali
10. Acid
11. Goggles
12. pH scale

	Activity
All	Complete the What am I? worksheet.
+	Can you think of 2 of your own What am I? questions?



Lesson Focus: Willingness to participate

# Lesson 6

Lesson	Resources	Context
6	Acid and alkali worksheet and equipment from worksheet	What happens when an acid is added to an alkali/base



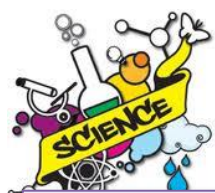
# Starter Title: What happens when an acid is added to an alkali?

	Activity
All	Where would you find acid in
+	Does this acid ever cause problems? How can you solve it.

Hydrochloric acid is found in the stomach where it is used to kill micro-organisms.

Yes it can cause indigestion or heart burn. We can neutralise the acid by taking medicine like Gaviscon that contains an alkali.





# Title: What happens when an acid is added to an alkali

## Homework:

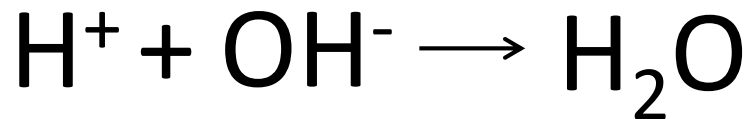
Level	Learning Objectives	Key Words	SPAG
All	<b>Identify</b> that a neutral solution can be obtained by adding an acid to an alkali.	Acid Alkali	<ul style="list-style-type: none"><li>To be able to use the keywords correctly when explaining ideas</li></ul>
Most	<b>Describe</b> how adding an alkali to an acid increases the pH. This is called neutralisation.	Indicator Universal indicator pH scale	
Some	<b>Explain</b> a word equation for neutralisation.	Neutralisation	



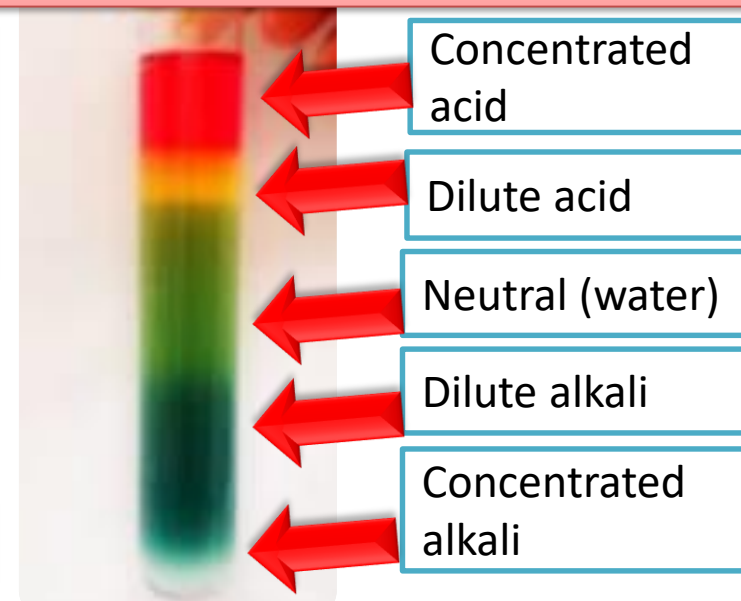
# Main Activity - modelling

In Lesson 4 we looked at concentrated and dilute and produced a rainbow using Universal indicator. But what actually happens when you add an acid to an alkali?

When you add an acid to an alkali the  $\text{H}^+$  ions of the acid combine with the  $\text{OH}^-$  ions of the alkali to make a neutral substance – anyone like to guess what it is?



The general word equation for an alkali and acid is:



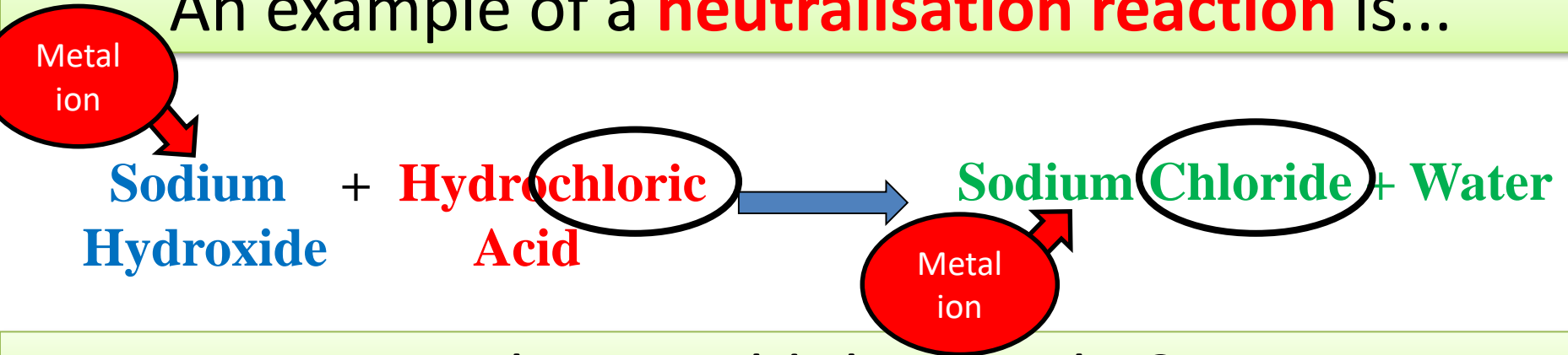
This is called a **neutralisation reaction**.



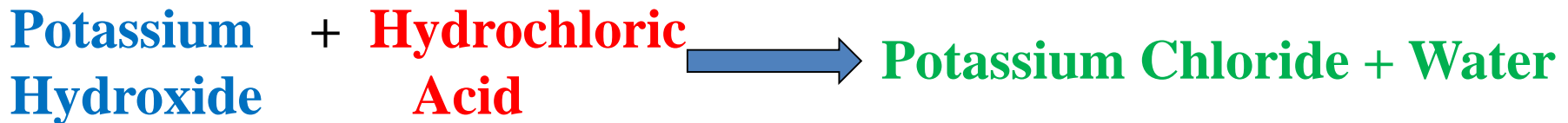
# Main Activity - modelling



An example of a **neutralisation reaction** is...



What would this one be?



# Main Activity – Task



Lesson 6 – Acids and Alkalis worksheet

Results

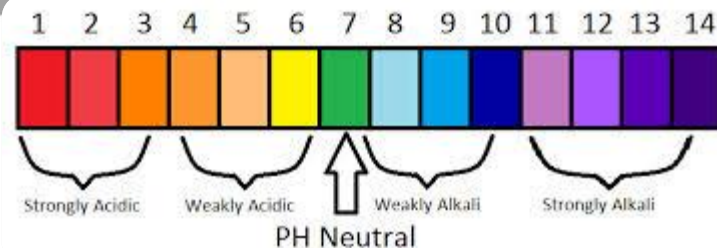
What happens when acids and alkalis are mixed?

Acid and Alkalis

You are going to find out what happens when you add acids and alkalis together.

## Method

1. Measure 5ml of acid into a test tube.
2. Add 2 drops of universal indicator.
3. Note the pH in the table.
4. Add 5 drops of alkali using the pipette to the test tube. Swill and note the pH.
5. Add another five drops and note the pH.
6. Keep adding alkali 5 drops at a time.
7. The change between acid and alkali will be sudden, so do not be tempted to add more alkali.



Number of drops of alkali added	pH	Number of drops of alkali added	pH
0		55	
5		60	
10		65	
15		70	
20		75	



**All**  
Complete the practical safely and **identify** when you have reached a neutral solution.

**Most**  
Complete the practical safely and answer question 1 and 2 on the worksheet.



**Some**  
Complete the practical safely and answer question 3 on the worksheet.

# Assessment Phase



Level	Assessment Task	Expectations
All	<ol style="list-style-type: none"> <li>1. What type of solution do you get when you add an acid to an alkali in the correct proportions?</li> <li>2. What colour would it be on the pH scale?</li> </ol>	<ol style="list-style-type: none"> <li>1. A neutral one that contains salt and water.</li> <li>2. Green</li> </ol>
Most	<ol style="list-style-type: none"> <li>3. Define what neutralisation is.</li> <li>4. Give the general word equation when an acid and an alkali react together.</li> </ol>	<ol style="list-style-type: none"> <li>1. Neutralisation is when an acid and alkali cancel each other out and produce a salt and water.</li> <li>2. Acid + alkali → salt + water</li> </ol>
Some	<ol style="list-style-type: none"> <li>5. Write a word equation for when the acid and alkali you are using react together.</li> <li>6. Explain what happens in terms of H<sup>+</sup> and OH<sup>-</sup> ions.</li> </ol>	<ol style="list-style-type: none"> <li>1. Dependent on chemicals used.</li> <li>2. The H<sup>+</sup> ions in the acid react with OH<sup>-</sup> in the alkali to produce water.</li> </ol>





**Write two separate statements on your learning and progress this lesson.**

**Use the sentence starters to help you.**

## **www**

The lesson went well because I  
learnt how to...

I now feel more confident when...

I understand how to...

This lesson I have practiced...

## **ebi**

I now need to learn how to...

I will feel more confident when I can...

I will practice at home using...

I need to practice explaining clearly  
how...

**Keywords:**

Acids, alkalis, neutralisation, neutral,  
pH



# Lesson 7

Lesson	Resources	Context
7	Investigating antacids practical. Variety of different antacid tablets to test and student worksheet	Neutralisation



# Starter - Title: Investigating Antacids

Which antacid is the most effective at neutralising acid?

**All** – What factor are you going to investigate this lesson?

**Most** – How will you measure this?

**Some** – What are your controlled variables?

Think

Think about the questions and write down in your books.

Pair

Discuss your ideas with you partner.

Share

Share with the class what you think.



Lesson Focus: Co-operation and collaborati



# Title: Investigating Antacids

**Homework:** Plot a graph of your results.

Level	Learning Objectives	Key Words	SPAG
All	<b>State</b> the independent and dependant variables for your investigation and produce a method.	Independent variable	• To be able to use the correct terminology when explaining ideas
Most	<b>Describe</b> how you will make your investigation a fair test and gather reliable results.	Dependant variable Reliable	
Some	<b>Predict</b> what the results will be, giving explanations and <b>evaluate</b> your method.	Prediction	



Lesson Focus: Co-operation and collaboration

# Main Activity – Task

Using the worksheets provided, complete the following:

## Science Investigations



You need to be able to write about the investigations that you do in science. Investigations help scientists find out answers to questions that we have about the world. We often need to do experiments to help us. **You now need to write about your science investigation.** Use these sheets to help you organise your thoughts. You can write rough notes in here and then later write or neatly on lined paper (or in your books) using full sentences.



### All

**State** the independent and dependant variables for your investigation and produce a method.



### Most

**Describe** how you will make your investigation a fair test and it reliable.

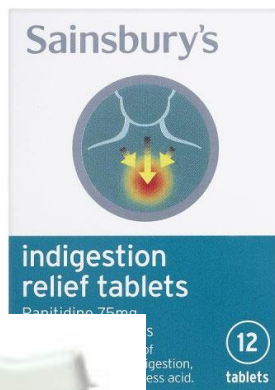


### Some

**Predict** what the results will be, giving explanations and **evaluate** your method.

# Main Activity – Task

Using your method, complete the following:



**Most**

Carry out your investigation safely and record your results.



**Some**

Carry out your investigation safely and gain reliable results.

**All**

Carry out your investigation safely.

# Assessment Phase

Level	Assessment Task	Expectations
All	<ol style="list-style-type: none"> <li>1. What were you trying to find out in your investigation?</li> <li>2. What were the independent and control variables?</li> </ol>	<ol style="list-style-type: none"> <li>1. Which antacid is best at neutralising stomach acid?</li> <li>2. IV = the type of antacid, DV = how neutral the solution becomes, CV = amount and concentration of acid, amount of antacid, time</li> </ol>
Most	<ol style="list-style-type: none"> <li>1. How did you make it a fair test?</li> <li>2. What did you find out from your experiment?</li> </ol>	<ol style="list-style-type: none"> <li>1. Made sure the only thing that was changed was the type of antacid used and all the controlled variables remained the same.</li> <li>2. Select student responses.</li> </ol>
Some	<ol style="list-style-type: none"> <li>1. Explain if your results agree with your prediction.</li> <li>2. Explain whether your results are reliable and how you could check them.</li> </ol>	<ol style="list-style-type: none"> <li>1. Select student responses.</li> <li>2. Reliable is when something is dependable and it will give the same outcome every time – for example if you repeated your tests you got exactly the same results. Use as many repeats as possible, to reduce the chance of an anomaly skewing the results.</li> </ol>





**Write two separate statements on your learning and progress this lesson.**

**Use the sentence starters to help you.**

## **www**

The lesson went well because I  
learnt how to...

I now feel more confident when...

I understand how to...

This lesson I have practiced...

## **ebi**

I now need to learn how to...

I will feel more confident when I can...

I will practice at home using...

I need to practice explaining clearly  
how...

### **Keywords:**

Acids, alkalis, neutralisation, neutral,  
pH, antacid, reliable, valid



# Lesson 8

Lesson	Resources	Context
8	Badger activity sheet	Revision

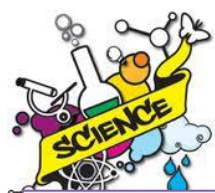
Quickly take your seat and spend these few minutes to review the keywords for a definition quiz!

**def·i·ni·tion** n. 1.  
The teacher gave de  
of the new words.  
of an image (pict  
TV screen

1. Indicator
2. Dilute
3. pH Scale
4. Neutralisation
5. Antacid







# Title: Acid and Alkali Revision and Assessment

## Homework:

Level	Learning Objectives	Key Words	SPAG
All	You should be able to explain the basic concepts covered and relate them to antacids (e.g. classify solutions using indicators).	Acid Alkali Indicator	<ul style="list-style-type: none"><li>To be able use correct punctuation: full stops, commas and apostrophes</li></ul>
Most	You should be able to explain concepts in more detail (e.g. pH, indicators and neutralisation) relating to antacids.	Universal indicator pH scale Neutralisation	
Some	You should be able to explain concepts in further detail (e.g. explain how a neutral solution can be obtained). Give a simple equation to describe what is happening in the reaction.	Antacid	



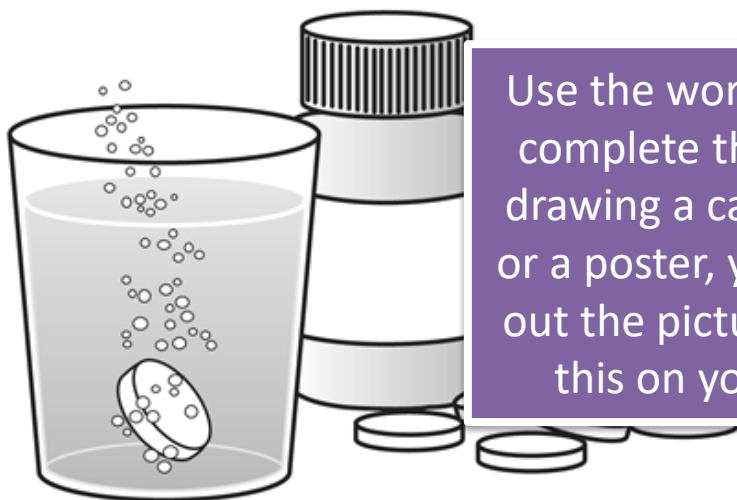
# Main Activity – Task/Assessment

## ACIDS AND ALKALIS

### HOW DO ANTACID TABLETS WORK?

Indigestion is caused by your stomach acid rising up your gullet, causing pain.

Antacid tablets are taken to relieve this pain. The tablets contain alkalis such as calcium hydroxide.



Use the worksheet and complete the tasks by drawing a cartoon strip or a poster, you may cut out the picture and use this on your work.

#### TASK

Explain simply how you think antacid tablets may work. Use your knowledge and understanding of this topic to explain your ideas. Present your ideas in writing and diagrams; you could draw a cartoon.

#### KEY WORDS

acid, alkali, calcium hydroxide, carbon dioxide, compound, dissolve, element, hydrochloric acid, hydrogen ion, metal ion, neutralisation, pH scale, reaction, salt, water

## ACIDS AND ALKALIS

### HOW DO ANTACID TABLETS WORK?

	You might:
All	<ul style="list-style-type: none"><li>• State simply why people take antacid tablets.</li><li>• Draw a simple diagram to show what happens in the stomach.</li><li>• Identify the two chemicals that react together.</li><li>• State whether the reaction can be reversed or not.</li><li>• Describe simply how an antacid tablet works.</li><li>• Draw a simple diagram to show what happens in the stomach.</li><li>• Describe the reaction between an acid and an alkali using scientific words.</li><li>• Use most of the key words correctly in your description.</li></ul>
Most	<ul style="list-style-type: none"><li>• Explain simply how an antacid tablet works.</li><li>• Draw a simple particle diagram of acid and alkali particles reacting.</li><li>• Use a scientific model of particles to describe the reaction between an acid and an alkali.</li><li>• Use most of the key words correctly in your explanation.</li><li>• Use a word equation to describe the reaction.</li></ul>
Some	<ul style="list-style-type: none"><li>• Draw accurate particle diagrams of the acid and alkali reacting and show how the products are formed.</li><li>• Use the correct names of the particles or use symbols (not necessarily scientific ones) to label particles.</li><li>• Predict the changes in pH in the stomach before and after taking an antacid tablet.</li><li>• Explain the reactions with particle diagrams accurately, using correct chemical symbols.</li><li>• Write an accurate symbol equation for the reaction.</li><li>• Predict and explain the changes in pH in the stomach before and after taking an antacid tablet.</li></ul>



# Plenary - Peer Assessment

## ACIDS AND ALKALIS

### HOW DO ANTACID TABLETS WORK?

Indigestion is caused by your stomach acid rising up your gullet, causing pain.

Antacid tablets are taken to relieve this pain. The tablets contain alkalis such as calcium hydroxide.



Swap your work with your partner and peer assess using the success criteria. Give them an WWW and an EBI.

#### TASK

Explain simply how you think antacid tablets may work. Use your knowledge and understanding of this topic to explain your ideas. Present your ideas in writing and diagrams; you could draw a cartoon.

#### KEY WORDS

acid, alkali, calcium hydroxide, carbon dioxide, compound, dissolve, element, hydrochloric acid, hydrogen ion, metal ion, neutralisation, pH scale, reaction, salt, water

## ACIDS AND ALKALIS

### HOW DO ANTACID TABLETS WORK?

	You might:
All	<ul style="list-style-type: none"><li>• State simply why people take antacid tablets.</li><li>• Draw a simple diagram to show what happens in the stomach.</li><li>• Identify the two chemicals that react together.</li><li>• State whether the reaction can be reversed or not.</li><li>• Describe simply how an antacid tablet works.</li><li>• Draw a simple diagram to show what happens in the stomach.</li><li>• Describe the reaction between an acid and an alkali using scientific words.</li><li>• Use most of the key words correctly in your description.</li></ul>
Most	<ul style="list-style-type: none"><li>• Explain simply how an antacid tablet works.</li><li>• Draw a simple particle diagram of acid and alkali particles reacting.</li><li>• Use a scientific model of particles to describe the reaction between an acid and an alkali.</li><li>• Use most of the key words correctly in your explanation.</li><li>• Use a word equation to describe the reaction.</li></ul>
Some	<ul style="list-style-type: none"><li>• Draw accurate particle diagrams of the acid and alkali reacting and show how the products are formed.</li><li>• Use the correct names of the particles or use symbols (not necessarily scientific ones) to label particles.</li><li>• Predict the changes in pH in the stomach before and after taking an antacid tablet.</li><li>• Explain the reactions with particle diagrams accurately, using correct chemical symbols.</li><li>• Write an accurate symbol equation for the reaction.</li><li>• Predict and explain the changes in pH in the stomach before and after taking an antacid tablet.</li></ul>

