

Topic: Acids and Alkalis

Lesson	Lesson title
1	Acids and Alkalis
2	Using Indicators
3	Which indicator is best?
4	Neutralisation
5	Investigating indigestion remedies
6	Investigating indigestion remedies part 2

The two links below take you to The Oak National Academy Lessons.

The lessons include essential work on this topic, acids and alkalis and pH indicators. You may wish to explore more of these lessons if you have time.

The video lessons include tasks which are clearly explained.

<https://classroom.thenational.academy/lessons/acids-and-alkalis-chk38d/activities/2>

<https://classroom.thenational.academy/lessons/ph-scale-60r3gc/activities/2>

Questions for you to complete and then mark.

Q1.

Table 1 below shows the colour of universal indicator in acidic, neutral and alkaline solutions.

	acidic			neutral	alkaline		
colour of indicator	red	orange	yellow	green	blue	dark blue	purple

table 1

Ramy tested different liquids with the indicator solution.
His results are shown in table 2 below.

liquid	colour of indicator solution
Milk	green
lemonade	orange

water	green
fruit juice	red
washing-up liquid	blue

table 2

(a) Use Ramy's results to answer the following questions.

(i) Give the name of **one** acidic liquid in **table 2**.

.....

1 mark

(ii) Give the name of **one** neutral liquid in **table 2**.

.....

1 mark

(b) Ramy dissolved some bicarbonate of soda in distilled water. This produced an alkaline solution.

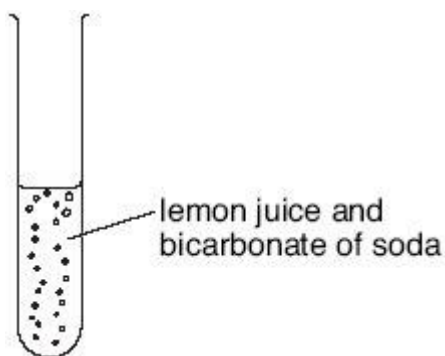
(i) Ramy added the indicator to the alkaline solution.

Suggest what colour the indicator became.
Use **table 1** to help you.

.....

1 mark

(ii) Ramy added lemon juice to the solution of bicarbonate of soda.



How could he tell that a gas was produced?

.....

1 mark

(c) Ramy mixed an acid with an alkali and tested the mixture with the indicator solution.

The indicator solution turned green.

What is the name of the reaction between an acid and an alkali?

Tick the correct box.

condensation

crystallisation

evaporation

neutralisation

1 mark
maximum 5 marks

Q2.

Water from red cabbage can be used to find out if a liquid is acidic, alkaline or neutral.

Type of liquid added to the cabbage water	colour of the cabbage water
acidic	red
alkaline	blue
neutral	purple

John added three different liquids to the cabbage water.

(a) Use the information above to complete the table below.

Liquid added to the cabbage water	colour of the cabbage water	Is the liquid acidic, alkaline or neutral?
water	purple	
lemon juice		acidic
washing up liquid	blue	

3 marks

(b) What word describes chemicals which change colour in acids or alkalis?
Tick the correct box.

filters

indicators

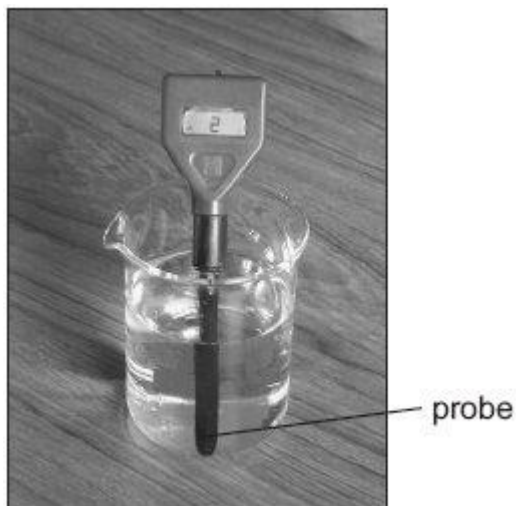
liquids

solids

1 mark
Maximum 4 marks

Q3.

Molly used a pH sensor to test different liquids. She dipped the probe of the sensor into each liquid and recorded the pH value in a table.



- (a) In the table below, tick **one** box for each liquid to show whether it is **acidic**, **neutral** or **alkaline**. One has been done for you.

liquid	pH value	acidic	neutral	alkaline
alcohol	7			
dilute hydrochloric acid	2	✓		
distilled water	7			
vinegar	3			
sodium hydroxide solution	11			

2 marks

- (b) Between each test Molly dipped the probe into distilled water.

- (i) Why did she do this?

.....

1 mark

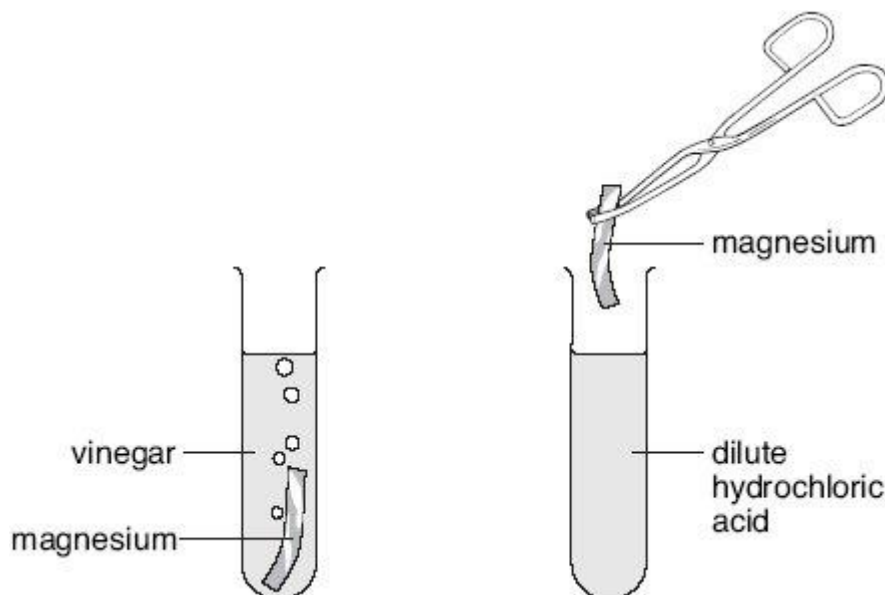
- (ii) Which other liquid in the table could Molly use between tests to have

the same effect as distilled water?

.....

1 mark

- (c) Molly put a piece of magnesium into a test-tube containing 20 cm³ of vinegar. She put another piece of magnesium into a test-tube containing 20 cm³ of dilute hydrochloric acid.



- (i) Molly thought that magnesium would react more vigorously with hydrochloric acid than with vinegar. What information in the table made Molly think this?

.....
.....

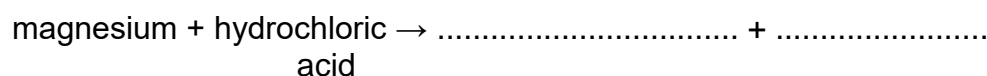
1 mark

- (ii) How would Molly be able to tell if a more vigorous reaction took place with hydrochloric acid than with vinegar?

.....
.....

1 mark

- (d) (i) Complete the word equation for the reaction between magnesium and hydrochloric acid.



2 marks

- (ii) After some time this reaction stopped. Why did the reaction stop?

1 mark
maximum 9 marks

Q4.

Matthew measured the pH of different soils.

(a) Tick **one** box in each row to show if each soil is acidic, neutral **or** alkaline.

soil	pH of soil	acidic	neutral	alkaline
A	4.5			
B	5.5			
C	6.3			
D	7.0			
E	7.8			

2 marks

(b) A hydrangea is a flowering plant. Matthew notices that the colour of hydrangea flowers is different for plants grown in different places.



hydrangea flower

He records the colour of the flowers on each plant.

His results are shown in the table below.

soil	pH of soil	colour of flowers			
		blue	violet	light pink	dark pink
A	4.5	✓			
B	5.5		✓		
C	6.3		✓		
D	7.0			✓	
E	7.8				✓

Look at Matthew's results.

Do his results support the statement that the colour of hydrangea flowers

depends on pH?

yes

no

Explain your answer.

.....
.....

1 mark

- (c) Matthew measured the pH of the soil near hydrangea plants found in different places.

Suggest one **other** variable Matthew could **not** control in his investigation.

.....
.....

1 mark

- (d) Matthew wants to find out if the colour of blue hydrangea flowers depends on inherited factors **or** environmental factors.
The flowers were growing in soil of pH 4.5.
He plants them in soil of pH 6.3.

Complete the table below to show the colours of the new flowers in soil of **pH**

6.3

- (i) if the colour is due to inheritance
(ii) if the colour is due to the environment

Use the table above to complete the table below.

	colour
starting colour of hydrangea flowers	blue
colour of new flowers if only due to inheritance	
colour of new flowers if only due to environment	

2 marks
maximum 6 marks

