Acids and bases: knowledge check

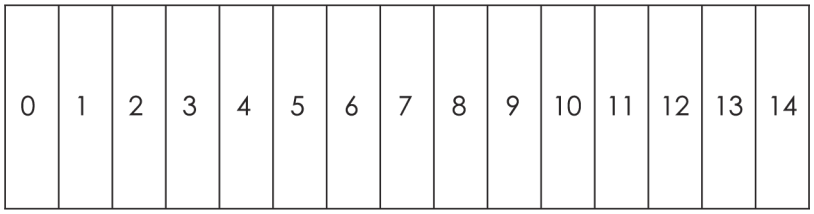
1.1 Label this diagram of the pH scale using the words below to show the pH of:

(a) an acidic solution

(b) an alkaline solution

(c) a neutral solution.

acidic **alkaline** **neutral**



1.2 Use the words to complete the sentences. You do not have to use all the words. You can use the words more than once.

acidic **acidity** **alkaline** **alkalinity**

conductivity **neutral** **reactivity**

(a) The pH scale measures the _____ or

_____ of a solution.

(b) _____ solutions have a pH less than 7.

(c) _____ solutions have a pH of 7.

(d) _____ solutions have a pH greater than 7.

1.3 Use the words to complete the sentences. You do not have to use all the words. You can use the words more than once.

hydrochloric acid **hydrogen**

sodium hydroxide solution **sulfuric acid**

(a) Three acids commonly found in school laboratories are

_____, nitric acid and _____.

(b) An alkali commonly found in school laboratories is

_____.

(c) _____ ions are present in all acidic solutions.

1.4 Use the words to complete the sentences. You do not have to use all the words. You can use the words more than once.

carbon dioxide **metal** **salt** **water**

These general equations represent some methods used to make salts:

(a) acid + metal → _____ + hydrogen

(b) acid + metal oxide → salt + _____

(c) acid + metal hydroxide → salt + _____

(d) acid + metal carbonate → salt + _____ +

_____

1.5 Use the words to complete the sentences. You do not have to use all the words. You can use the words more than once.

common salt **laundry detergent** **lemon juice** **water**

(a) Two everyday acids you might find in your home are vinegar and

_____.

(b) Two everyday bases you might find in your home are

_____ and baking soda.

Acids and bases: test myself

2.1 What is an indicator?

An indicator is a substance that changes _____

depending on the _____ of the solution.

2.2 What colour is universal indicator in an acidic solution, an alkaline solution and a neutral solution?

(a) Universal indicator is _____ in an acidic solution.

(b) Universal indicator is _____ in an alkaline solution.

(c) Universal indicator is _____ in a neutral solution.

2.3 What colour is universal indicator in a solution with a pH of 1?

Universal indicator is _____ in a solution with a pH of 1.

2.4 What colour is the indicator litmus in acidic and alkaline solutions?

Litmus indicator solution turns _____ in acidic solutions

and _____ in alkaline solutions.

2.5 What is a base? Give an example.

A base is any substance that _____ with an acid to form

a _____ and _____. For example,

_____ is a base.

2.6 What is an alkali? Give an example.

Alkalis are soluble _____ and have a

_____ greater than 7. For example,

_____ is an alkali.

2.7 What type of reaction occurs when an acid reacts with an alkali?

A _____ reaction occurs when an acid reacts with an alkali.

2.8 What names are given to the types of salts formed in reactions with these acids?

(a) Hydrochloric acid produces _____.

(b) Sulfuric acid produces _____.

(c) Nitric acid produces _____.

2.9 Name the salt made when copper oxide reacts with sulfuric acid.

The salt made when copper oxide reacts with sulfuric acid is

_____.

2.10 Draw lines to link the name of the acid with its formula.

(a) hydrochloric acid	H_2SO_4
(b) sulfuric acid	HNO_3
(c) nitric acid	HCl

Acids and bases: feeling confident?

3.1 Write word equations for the following reactions.

(a) Hydrochloric acid reacting with sodium hydroxide:

hydrochloric _____ + _____

hydroxide → sodium chloride + water

(b) Sulfuric acid reacting with sodium hydroxide:

_____ acid + sodium hydroxide → sodium

_____ + _____

(c) Nitric acid reacting with sodium hydroxide:

nitric acid + _____ _____ →

sodium _____ + water

3.2 Write balanced symbol equations for the reactions in question 3.1. Use the formulas given and add numbers to complete and balance the equations.

HCl H_2O H_2SO_4 HNO_3 $NaCl$

$NaNO_3$ $NaOH$ Na_2SO_4

(a) Hydrochloric acid reacting with sodium hydroxide:

_____

(b) Sulfuric acid reacting with sodium hydroxide:

_____

(c) Nitric acid reacting with sodium hydroxide:

_____

Acids and bases: what do I understand?

Think about your answers and confidence level for each mini-topic. Decide whether you understand it well, are unsure or need more help. Tick the appropriate column.

Mini-topic	I understand this well	I think I understand this	I need more help
I can describe the pH scale.			
I know the pH of acidic and alkaline solutions.			
I can name common acids and alkalis.			
I can write general word equations for reactions of an acid with a: • metal • metal oxide • metal hydroxide • metal carbonate.			
I can write chemical formulas for common laboratory acids.			
I can name types of salt produced by reactions with: • hydrochloric acid • sulfuric acid • nitric acid.			
I can use universal and litmus indicators to identify acidic, alkaline and neutral solutions.			
Feeling confident? topics	**I understand this well**	**I think I understand this**	**I need more help**
I can write word equations for reactions between an acid and a: • metal • metal oxide • metal hydroxide • metal carbonate.			
I can write symbol equations for reactions between an acid and a: • metal • metal oxide • metal hydroxide • metal carbonate.			