Acids and bases: knowledge check

1. Label this diagram of the pH scale using the words below to show the pH of:
	1. an acidic solution
	2. an alkaline solution
	3. a neutral solution.

acidic alkaline neutral



1. 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

* 1. The pH scale measures the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of a solution.
	2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ solutions have a pH less than 7.
	3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ solutions have a pH of 7.
	4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ solutions have a pH greater than 7.
1. 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

* 1. Three acids commonly found in school laboratories are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, nitric acid and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
	2. An alkali commonly found in school laboratories is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
	3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ions are present in all acidic solutions.
1. 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:

* 1. acid + metal $\rightarrow $ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ + hydrogen
	2. acid + metal oxide $\rightarrow $ salt + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	3. acid + metal hydroxide $\rightarrow $ salt + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	4. acid + metal carbonate $\rightarrow $ salt + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
1. 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

* 1. Two everyday acids you might find in your home are vinegar and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
	2. Two everyday bases you might find in your home are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and baking soda.

Acids and bases: test myself

1. What is an indicator?

An indicator is a substance that changes \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ depending on the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the solution.

1. What colour is universal indicator in an acidic solution, an alkaline solution and a neutral solution?
	1. Universal indicator is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in an acidic solution.
	2. Universal indicator is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in an alkaline solution.
	3. Universal indicator is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in a neutral solution.
2. What colour is universal indicator in a solution with a pH of 1?

Universal indicator is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in a solution with a pH of 1.

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

Litmus indicator solution turns \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in acidic solutions and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in alkaline solutions.

1. 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.

1. What is an alkali? Give an example.

Alkalis are soluble \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and have a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ greater than 7. For example, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is an alkali.

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

A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ reaction occurs when an acid reacts with an alkali.

1. What names are given to the types of salts formed in reactions with these acids?
	1. Hydrochloric acid produces \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
	2. Sulfuric acid produces \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
	3. Nitric acid produces \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. Name the salt made when copper oxide reacts with sulfuric acid.

The salt made when copper oxide reacts with sulfuric acid is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

1. Draw lines to link the name of the acid with its formula.
	1. hydrochloric acid H2SO4
	2. sulfuric acid HNO3
	3. nitric acid HCl

Acids and bases: feeling confident?

1. Write word equations for the following reactions.
	1. Hydrochloric acid reacting with sodium hydroxide:
	hydrochloric \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ hydroxide $\rightarrow $ sodium chloride + water
	2. Sulfuric acid reacting with sodium hydroxide:
	\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ acid + sodium hydroxide $\rightarrow $ sodium \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	3. Nitric acid reacting with sodium hydroxide:
	nitric acid + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ $ \rightarrow $ sodium \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ + water
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 H2O H2SO4 HNO3 NaCl

NaNO3 NaOH Na2SO4

* 1. Hydrochloric acid reacting with sodium hydroxide:
	2. Sulfuric acid reacting with sodium hydroxide:
	3. 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.
 |  |  |  |