Pause-and-think questions

Student version

Pause the video at the time stated to test or revise your knowledge of these practical experiments.

Time	Question

00:16 Give one property that a metal should have in order to make a hot water pipe.

_____

00:26 Give one property that a metal should have in order to make a food can.

_____

Reaction of metals with water

00:57 What is the name of the group 1 metals? _____

01:26 Why are all the group 1 metals stored in oil?

_____

_____

02:07 Explain what you see when you cut an alkali metal. Why does it not last long?

_____

_____

02:18 Fill in the chart below for the observation of the alkali metals in water.

alkali metal	observation in water
Lithium	
Sodium	
Potassium	

06:16 List two similarities in the observations for the reactions of the alkali metals with water.

1. _____
2. _____

06:16 List two differences for the reaction of potassium with water compared to sodium and lithium.

1. _____
2. _____

06:25 Why does the universal indicator go purple after the reaction of each of the alkali metals in water?

_____

_____

06:38 Complete the word and symbol equations for the reaction of lithium, sodium and potassium with water.

Lithium + water → _____ + _____

$2Li(s) + 2H_2O(l)$ → _____ + _____

Sodium + _____ → _____ + _____

$2Na(s) + 2H_2O(l)$ → _____ + _____

Potassium + water → _____ + _____

_____ + _____ → _____ + _____

06:43 Put lithium, sodium and potassium in order of reactivity – most reactive first.

_____ > _____> _____

Describe the trend in reactivity of the group 1 metals.

_____

Reaction of metals with acid

07:05 Why are metal reactions with acid described as exothermic reactions?

_____

07:15 How do you minimise heat loss during the reaction between metals and acid?

_____

_____

07:56 Identify the independent variable in a reaction of different metals with acid.

_____

Identify the dependent variable in the exothermic reaction of different metals with acid.

_____

07:59 Read the temperature and complete the table.

	Temperature °C		
Metal	**Initial**	**Final**	**Change**
Zinc			

08:49 Identify three control variables in this experiment for a fair test.

1. _____
2. _____
3. _____

09:10 Fill in the results chart for the reaction of magnesium, zinc, iron and copper with acid.

		Temperature °C		
Metal	**Observation with acid**	**Initial**	**Final**	**Change**
Zinc				
Magnesium				
Copper				
Iron				

09:28 What is the order of reactivity of magnesium, zinc, copper, iron putting the most reactive first?

_____ > _____ > _____ > _____

09:38 The acid used in this experiment is hydrochloric acid. What is the name of the salts that will be produced?

_____

10:06 The gas given off is hydrogen. What is the test for this gas?

_____

_____

10:17 Write a word and symbol equation for the reaction of zinc, iron and magnesium with acid.

Magnesium + hydrochloric acid → _____ + _____

_____ + _____ → _____ + _____

Zinc + hydrochloric acid → _____ + _____

_____ + _____ → _____ + _____

Iron + hydrochloric acid → _____ + _____

_____ + _____ → _____ + _____

10:22 Why don't we write an equation for the reaction of copper with hydrochloric acid?

_____

_____

Metal displacement reactions

11:02 Define displacement.

_____

_____

_____

12:49 Why do you not add magnesium to magnesium sulfate?

_____

_____

13:04 Complete the table with a tick or a cross to indicate where a reaction has taken place.

Metal / Metal salt solution	Magnesium	Zinc	Copper
Magnesium sulfate			
Zinc sulfate			
Copper(II) sulfate			

13:48 Write down the order of reactivity of magnesium, zinc and copper with the most reactive first.

_____ > _____ > _____

14:22 Write the word and symbol equations for the three reactions.

_____

_____

_____

_____

_____

_____

14:36 These reactions are redox equations. Define a redox reaction.

_____

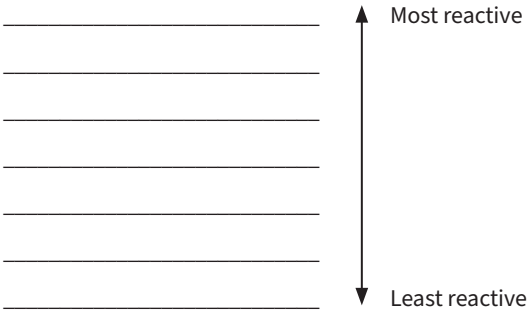
_____

_____

14:36 Complete the sentences using **reduced** and **oxidised**.

The more reactive metal is _____ and the less reactive metal is _____.

14:50 Using all the results from the three experiments of metals with water, acid and displacement, put the following metals in order of reactivity with the most reactive first:



15:30 Now try writing a longer answer to this question using the structure strips:

A student has a sample of an unknown metal solid, labelled 'metal *x*'. The sample is shiny in appearance and grey in colour.

Describe two different experiments that the student could carry out to place metal x in the reactivity series. Describe the reactions that would take place and the expected results if metal x is more reactive than copper but less reactive than iron.

Suggest an identity for metal *x*.

This question has a structure strip. Find more resources to support you here rsc.li/3baSTPO.