Reactions of Metals

The activities are related to the work in the KS3 Science Scheme of Work Unit 9F: Patterns of Reactivity.

Pupils learn that although metals react in a similar way with oxygen, water and acids, some react more readily than others. The aim is to establish and use a reactivity series for metals and represent chemical reactions by word and/or symbol reactions.

This lesson also builds on ideas in unit 9E Reactions of Metals and Metal Compounds – explore the properties of metals and non-metals.

Organisation of the Materials

The SMART Notebook™ file is saved as "KS3 metals.notebook". It consists of 12 pages, the first of which is a title page.

There are eight pages to support the activity. These can be used as lesson starters, lesson plenaries or to support the main part of the lesson. Page 10 contains a copy of the periodic table. Page 11 contains links to some useful websites and page 12 contains teachers notes.

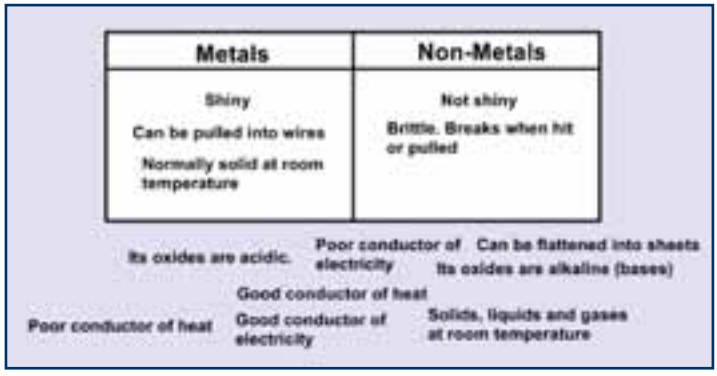
The materials can also be used for Year 9 SATS revision.

Activity 1

This activity can be used to recap on properties of metals and non-metals from unit 9E.

You might like to ask pupils to think about the properties of metals and non-metals that they can remember from previous lessons. Many of these properties are then shown on page 2.

Ask pupils to choose a property from the bottom of page 2 and drag it to the correct column to show whether it is a property of a metal or a non-metal.



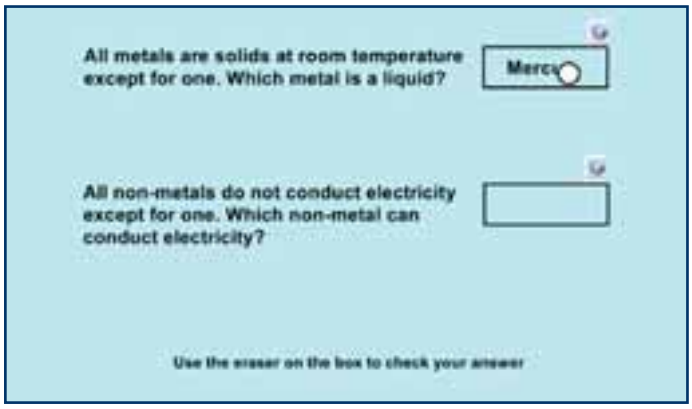
Page 2

Activity 2

This quick activity asks pupils to consider the two exceptions to the general rules of metals and non-metals.

Give the two questions to the pupils and ask them to write down the two answers.

The answers are hidden in the boxes. Use the eraser tool to erase the blue pen to reveal the answer underneath.



Page 3

Notes

Activity 3

Page 4 of the Notebook file contains a set of labels, each one containing the name of a metal.

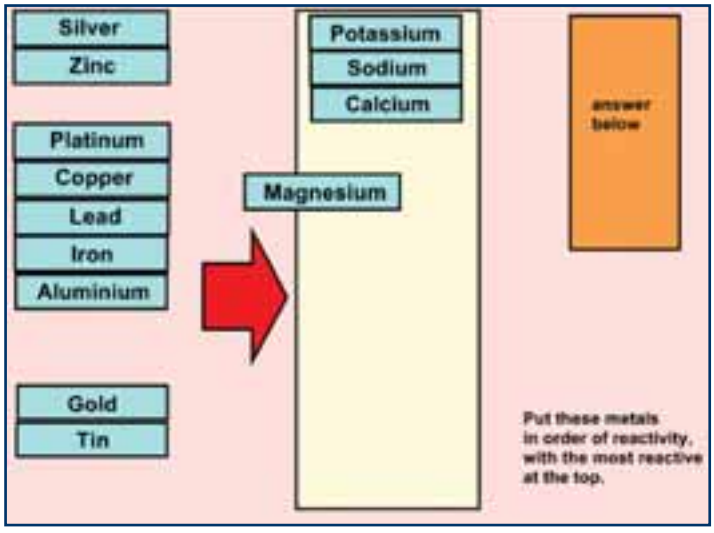
Ask the pupils to think about the correct order of reactivity, with the most reactive at the top. You might like to print this page off to be used as a worksheet; pupils can work out the correct order on paper first.

Ask a pupil to come to the SMART Board™ interactive whiteboard and use the selection tool to drag these cards to the white box and put them in the correct order of reactivity. You can check their answer by deleting the orange box.

Challenge the pupils to come up with a mnemonic to remember the correct order of the reactivity series, such as:

Please **S**top **C**alling **M**y **A**unt **Z**elda **I**n **L**eeds, **C**os **S**he's **G**etting **P**ickled.

Write the best versions up on a blank page of the Notebook file and save for future use.



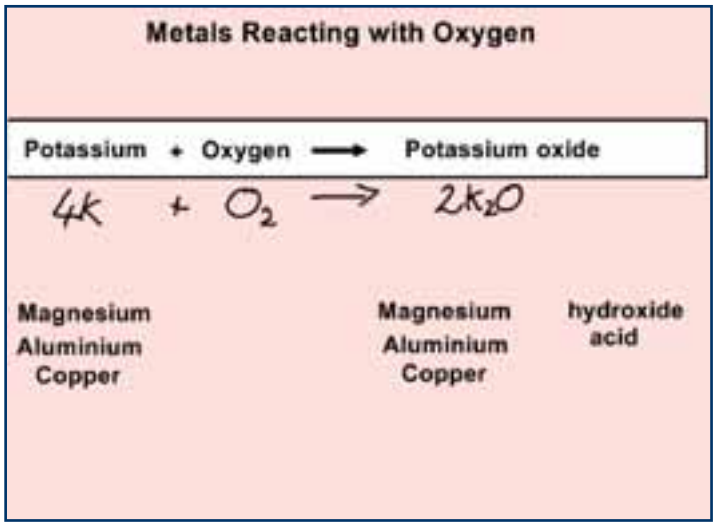
Page 4

Page 5 contains a blank equation to show metals reacting with oxygen.

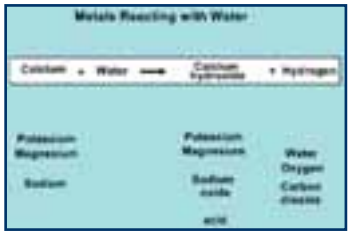
Several different equations are possible by dragging different labels into the white box to build up an equation. Use the 'selection' tool to drag the labels into place.

You can then ask pupils to write out the equation in symbols in the space below the white box using the pen tools.

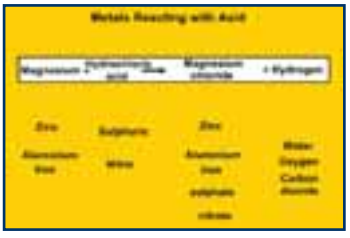
Similar activities are found on pages 6 and 7 to show reactions with water and acid.



Page 5



Page 6



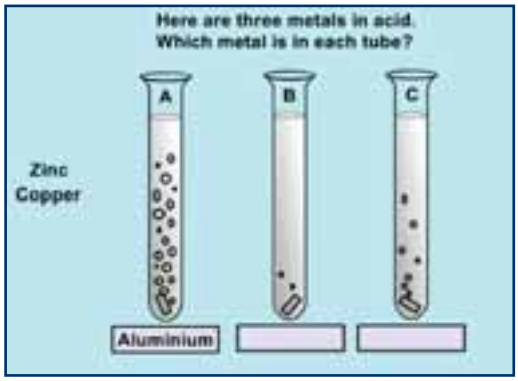
Page 7

Activity 4

This is a quick summary slide to ask pupils to consider the reaction of three different metals with acid.

Ask the pupils to consider the number of bubbles produced and what that tells them about the reaction taking place.

Drag the names of the three metals into the boxes below the corresponding tubes.

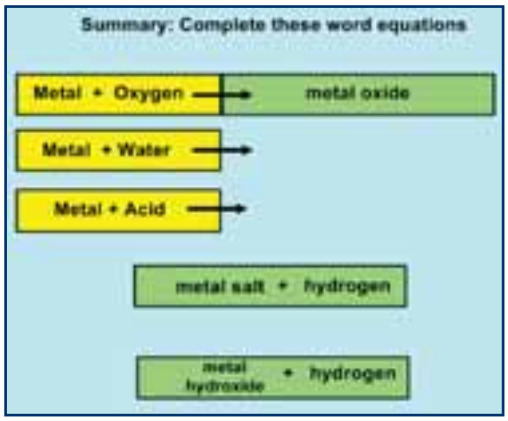


Page 8

Activity 5

This is a quick summary slide to ask pupils to consider the reaction of metals with acid, water and oxygen.

Give them some thinking time to work out the answers first, then bring one pupil up to the board to match the two halves of the equations.



Page 9

Notes

Other Notes

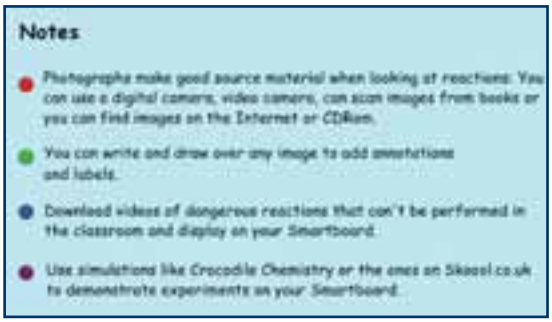
The SMART Notebook Gallery has an Education area, within which is a Science and Technology area. Within the Chemistry area there are some useful images and diagrams that you can drag into a notebook page, resize and manipulate.

Google is a great source of images to use with your Notebook files. Use the camera tool to capture images and bring them into your notebook.

Use video clips of chemical reactions that you cannot do safely in a lab, such as caesium and water. If you have the Chemistry Set 2000 CD ROM or Multimedia Science School (both via **www.platolearning.co.uk**) then this contains many group 1 reaction videos.

The Sodium Party website contains video clips of large pieces of sodium reacting with water. Good for starting lessons with a bang!

You can modify the "KS3 metals.notebook" Notebook file in any way you like – but it would be a good idea to save it with a different name in case you want to access the original again in the future.

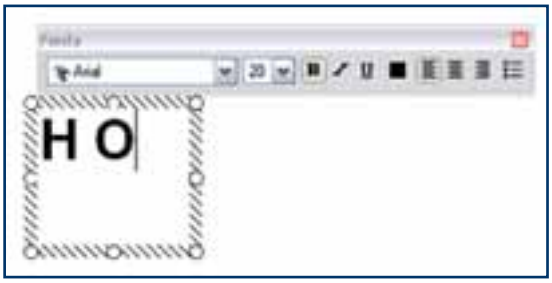


Page 12

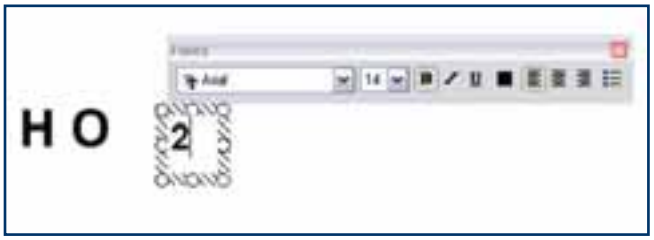
Quick chemical formulae (or how to avoid typing them out every time!).

SMART Notebook™ does not have a super/subscript feature to produce Chemical Formulae, but it is easy to produce a similar effect.

For example to produce water, H2O first type in H O (with a space):



Then in a separate text box, add the number 2 to the page in a slightly smaller font.



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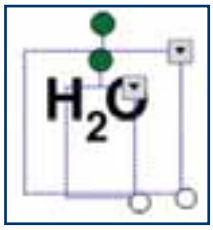
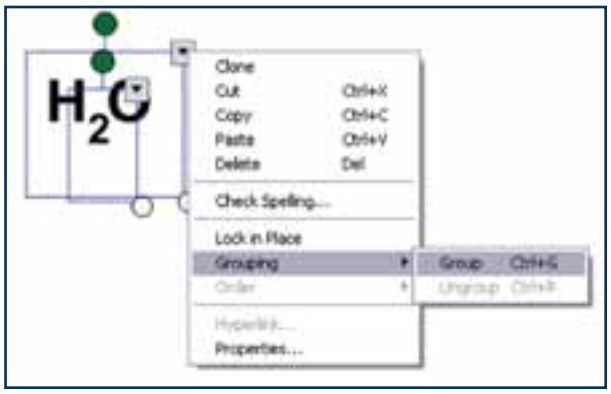
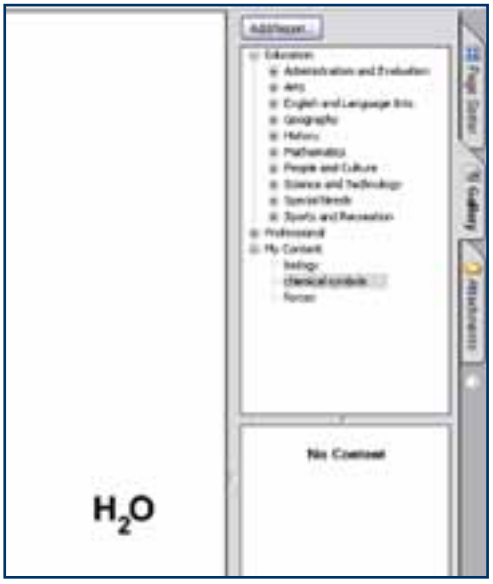
Other Notes continued



Move the 2 so that it is in the correct position between the H and the O and then select both items.



Then from the Options button in the corner (grey box with triangle) select 'Grouping' and then 'Group'. This will group the two items together into one object.



You can then add this to your own custom gallery by selecting the 'My Content' area of the gallery, and then simply dragging this object onto the side panel.

In this way you can build up a library of common formulae that you will use in day-to-day teaching, such as H2, O2, SO4, CO3, C6H12O6.

Whenever you want to add them to your Notebook file, simply drag them out of the gallery onto the page. You can even add sub-categories to organise your library more efficiently.

Notes

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