

Name:
Science Class:
Teacher:
Hand in day:

Y8 Science

Term 2 Homework Booklet

Chemistry

	Hand in Date	Parents Signature
Metals and Non-Metals		
Homework 1		
Homework 2		
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Homework 4		
Homework 5		

Metals and Non-Metals Homework 1:

Comprehension Task

Metals

The common properties of most metals are:

- high melting and boiling points
- solids at room temperature
- hard
- strong
- shiny (when polished)
- good conductors of heat and electricity
- **malleable** (can be bent and shaped)
- **ductile** (can be stretched into wires without breaking)
- **sonorous** (make a ringing noise when hit)

Metals burn in air to form oxides that are **basic** (opposite of acidic) and are often solids

- calcium + oxygen → calcium oxide
- metal oxides tend to dissolve in water to form **alkaline** solutions (pH numbers above 7)

Non-Metals

The common properties of most non-metals are:

- low melting point and boiling points
- many are gases at room temperature
- brittle (easily break when solid)
- dull (not shiny)
- poor conductors of heat and electricity.

Non-metals burn in air to form oxides that are acidic, and are often gases

- carbon + oxygen → carbon dioxide
- non-metal oxides tend to dissolve in water to form **acidic** solutions (pH numbers below 7)

Questions

1. What sort of melting points do metals usually have?
2. What are metals good conductors of?
3. Metals are usually malleable. What does this mean?
4. What sort of oxides do metals form when they burn in air?
5. Write a word equation showing the metal **magnesium** burning in **oxygen**
6. Metals are usually ductile. What does this mean?
7. What physical state are non-metals usually in at room temperature?

Bonus question – can you think of a non-metal element in the periodic table that is actually a solid?

8. What sort of oxides do non-metals form when they burn in air?
9. Write a word equation showing the non-metal element **nitrogen** burning in **oxygen**
10. What pH numbers do
 - a) acids have?
 - b) alkalis have?

Metals and Non-Metals Homework 2:

Study the list of properties of metals in your knowledge organiser.

Form the list of properties, give the two best properties of metals that make them suitable for the following uses.

eg. drill bits are made from steel as it is hard and has a high melting point (as they get very hot when the drill is working)

Copper is used to make electrical wires

.....

.....

Steel (iron) is used to make cooking pans

.....

.....

Gold is used to make jewellery

.....

.....

Brass is used to make musical instruments

.....

.....

Copper is used to make water pipes in central heating

.....

.....

Metals and Non-Metals Homework 3:

Use your knowledge organiser to make sure you know how to complete each of the equations below.

Remember that:

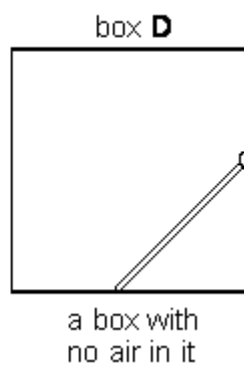
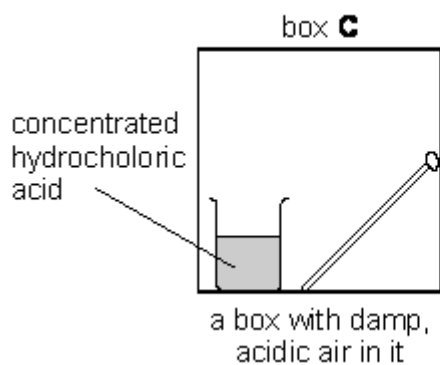
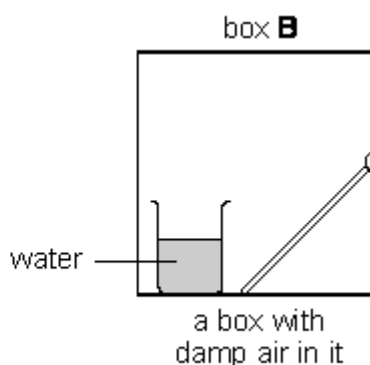
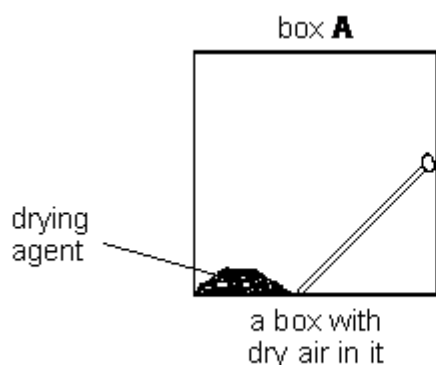


(where the name of the salt depends on the acid used – see knowledge organiser)

1. calcium + oxygen \rightarrow
2. sodium + water \rightarrow
3. iron + hydrochloric acid \rightarrow
4. zinc + oxygen \rightarrow
5. magnesium + sulfuric acid \rightarrow
6. potassium + water \rightarrow
7. lithium + oxygen \rightarrow
8. calcium + water \rightarrow
9. magnesium + oxygen \rightarrow
10. zinc + nitric acid \rightarrow

Metals and Non-Metals Homework 4:

Four shiny iron nails are put in small sealed plastic boxes. The labels show what else is in the boxes.



- (a) (i) In which **two** boxes will the iron **not** rust or corrode?

..... and

2 marks

- (ii) In which box will the iron corrode the most?

.....

1 mark

- (b) Many parts of bicycles are made from iron or steel. These parts can rust easily, even indoors. Give **two** ways to stop these parts rusting.

1.

2.

2 marks

Maximum 5 marks

The table shows the observations made when four metals are added to cold water and to dilute hydrochloric acid.

metal	observations with cold water	observations with dilute hydrochloric acid
zinc	no reaction	bubbles of gas form and the metal slowly dissolves
platinum	no reaction	no reaction
potassium	the metal floats and then melts, a flame appears, and sometimes there is an explosion	(cannot be done safely)
nickel	no reaction	a few bubbles of gas form if the acid is warmed

(c) Write the names of these **four** metals in the order of their reactivity.

most reactive

.....

least reactive

.....

1 mark

(d) (i) Give the name of another metal, **not** in the table, which reacts in a similar way to potassium.

.....

1 mark

(ii) What gas is formed when zinc reacts with dilute hydrochloric acid?

.....

1 mark

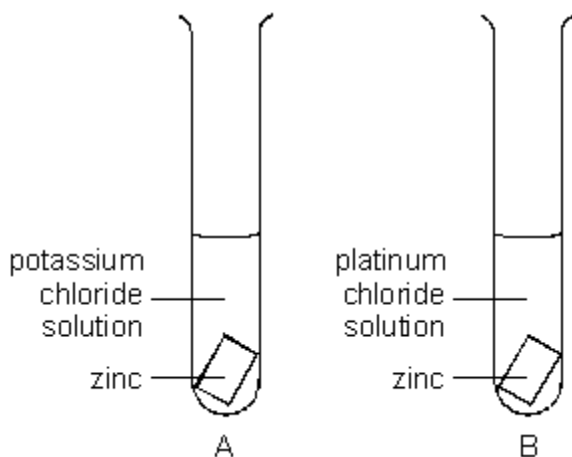
(iii) The experiment with potassium and dilute hydrochloric acid should **not** be done in school laboratories. Suggest why it is dangerous.

.....

.....

1 mark

(e) A scientist set up two test-tubes as shown below.



In test-tube B the zinc strip was slowly covered with a grey deposit. Nothing happened in the other test-tube.

(i) What was the grey deposit in test-tube B?

..... 1 mark

(ii) Why was this grey deposit formed in test-tube B?

..... 1 mark

(iii) Explain why **no** reaction took place in test-tube A.

.....
..... 1 mark

Maximum 12 marks

Metals and Non-Metals Homework 5:

Reactive metals can displace less reactive ones.

We can write word equations to show the displacement reactions.

eg 1. zinc + copper sulfate \rightarrow zinc sulfate + copper
(zinc displaces copper, as zinc is more reactive than copper)

eg 2. copper + iron oxide \rightarrow no reaction
(copper cannot displace iron, as copper is less reactive than iron)

**Use the order of reactivity for metals in your knowledge organiser to complete the following equations.
If the substances will not react, write 'no reaction'**

(There should be two equations that give 'no reaction')

1. iron + copper sulfate \rightarrow

2. magnesium + zinc oxide \rightarrow

3. iron + calcium nitrate \rightarrow

4. zinc + silver chloride \rightarrow

5. lithium + copper nitrate \rightarrow

6. potassium + zinc oxide \rightarrow

7. aluminium + iron oxide \rightarrow

8. calcium + lead chloride \rightarrow

9. magnesium + sodium sulfate \rightarrow

10. tin + gold chloride \rightarrow