

Prior to the moderation exercise, please complete the following information and submit it to your facilitator with assessment evidence from one learner that you judge to have successfully attained the Es' and Os'.

Experiences and Outcomes:

I have developed my knowledge of the Periodic Table by considering the properties and uses of a variety of elements relative to their positions.

SCN 3-15a

By contributing to experiments and investigations, I can develop my understanding of models of matter and can apply this to changes of state and the energy involved as they occur in nature.

SCN 3-05a

Having contributed to a variety of practical activities to make and break down compounds, I can describe examples of how the properties of compounds are different from their constituent elements.

SCN 3-15b

Learning Intentions:

To understand that relative positions of elements in the periodic table (metals, non-metals/groups/periods), their properties and uses.

Presents scientific findings using tables.

Understand the effect of temperature on the changing state of elements.

Make and break compounds to investigate how the properties of substances change from elements to compounds.

Observe energy changes in chemical reactions.

Describe examples of how properties of compounds are different from their constituent elements.

Name simple two element compounds and identify these as ending in 'ide'

Write simple word equations.

Develop skills

Carry out practical activities applying safety measures to control all risks and hazards identified.

Develop observation skills, communication skills and team working skills

Success Criteria:

1. I can Investigate and describe properties of metals and non-metals, for example, appearance, conductivity of electricity, position in the Periodic Table and their uses linked to their properties. I can state that elements are organised in the Periodic Table by atomic number, each with its own unique symbol, and that elements with similar chemical properties are placed together in vertical groups.
2. I can Identify and name the groups 'alkali metals', 'halogens' and 'noble gases' and describes their reactivity.
3. Investigates and describes at least two examples of compounds with properties that are different from their constituent elements, for example, hydrogen explosion and electrolysis of water.
4. I can construct names of two-element compounds which are derived from the names of the elements, from which it is formed, with a suffix of-ide.
5. Constructs word equations for simple reactions, for example, carbon reacting with oxygen:
carbon + oxygen carbon dioxide.
6. Safely carry out practical experiment.
7. Present findings of practical experiment
8. Use melting/boiling point data and apply this knowledge to identify and classify substances as solid, liquid or gas at a given temperature.

Briefly outline the context and range of quality learning experiences that have been provided making reference to the chosen design principles.

The experiences and outcomes were taught over approximately two weeks.

Lesson 1: Discussion on the Periodic Table and prior knowledge of elements. A short video is presented on the history of elements and the definition of an element. An activity to look at examples of elements and classify them into similarities. E.g. all metals look similar so are grouped together. Play element bingo to learn symbols and atomic numbers of elements. (*challenge and enjoyment*)

Lesson 2: Starter activity on lesson 1 success criteria to group elements into metals and non-metals. Class discussion on properties of elements on the Periodic Table. i.e. prior knowledge on properties and uses of some metals. Group discussion on testing elements for electrical conductivity followed by practical activity on testing elements. Pupil peer assess if they have been successful. Further discussion on elements and their position in the Periodic Table (Name, symbol, atomic number and group in PT).

Lesson 3: Lesson Starter – knowledge of Periodic table. Introduction of melting point and boiling point information in data booklet. Examine states of elements at room temperature. (*challenge and enjoyment*). Use data booklet to apply mp and bp to states of elements at given temperature (breadth, depth and application).

Lesson 4: Lesson Starter- State of element (application of knowledge). Demonstration on making compound using copper and chlorine gas. Discussion on energy change. Discuss observations of elements compared to new compound formed. Discussion on naming of new compound and writing word equation. Pupils apply this knowledge by writing other word equations for reactions with metals and non-metals (personalisation and choice, *progression, challenge and enjoyment*).

Lesson 5: Lesson Starter- Write word equations and peer assess. Discussion on energy released when compound was made from elements. Discuss energy requirement to break the compound Copper(II) chloride down to its elements. Carry out practical activity to break copper(II) chloride into its elements by passing electricity through it. Observe products at each electrode. Write word equation for reaction to break down copper(II)chloride into its constituent elements (challenge, application and enjoyment)

Record the range of assessment evidence that was gathered to meet the success criteria (Say, Write, Make, and Do) considering breadth, challenge and application.

Say: Discussion in groups, Questioning of pupils during lesson starters, throughout the lesson and while carrying out practical activities. Discussion on observations, class discussions on success criteria (breadth and challenge)

Write: Completion of lesson starters, notes in jotters, complete diagrams to categorise elements in Periodic Table, construct table of results, writing symbols for elements and atomic number. (challenge and application)

Make/Do: Carry out practical experiments safely, observe findings. (breadth, challenge and application).

Work in groups to develop communication and team working skills

Briefly outline the oral/written feedback given to the pupil on progress and next steps, referring to the learning intention and success criteria.

Oral feedback – Given continuously during class discussions. Feedback on groups in Periodic Table during teacher walk-about. Questioning during class discussion - learning intentions and success criteria. Feedback and next steps identified and discussed with all pupils.

Written feedback – Notes in jotters during teacher walk around. Collection and marking of homework and peer assessment of Lesson Starters and written questions

Pupil Voice:

What have you learned? How did you learn? What skills have you developed?
Pupils completed plenary questionnaires on what they have learned after lesson 2

The pupil was asked the questions above and gave the following responses:

'I have learned that the Periodic Table is made up of all elements and the elements can be metal or non-metal. I have also learned that the Periodic Table can be split into solids, liquids and gas.'

'I carried out an experiment safely to find out that all metals conduct electricity and all non-metals do not, except carbon (graphite).'

'I learned that elements have different uses because they have different characteristics, e.g. all metals conduct electricity so copper is used in electrical wires.' I was able to learn this by looking at elements and discussing the uses of these elements in my group'

'I learned that elements are different when they are on their own and when they are in

compounds. We looked at the teacher reacting copper metal with chlorine gas. The elements looked very different from the new compound made which was a green solid.'

'I have learned how to name compound when they are made from two elements and the ending changes to 'ide'. I was able to write a chemical equation to show the change'.

'I was able to use this knowledge to solve problems and name compounds I didn't know.'

'I have developed practical skills by doing experiments and observing reactions.

I have also learned to solve problems by practicing questions and I have worked in a group to help me with talking and team working skills.'

Did the learner successfully attain the outcomes? YES/NO

Evidence 1

sc 1

Elements and the Periodic Table.

Observing Elements

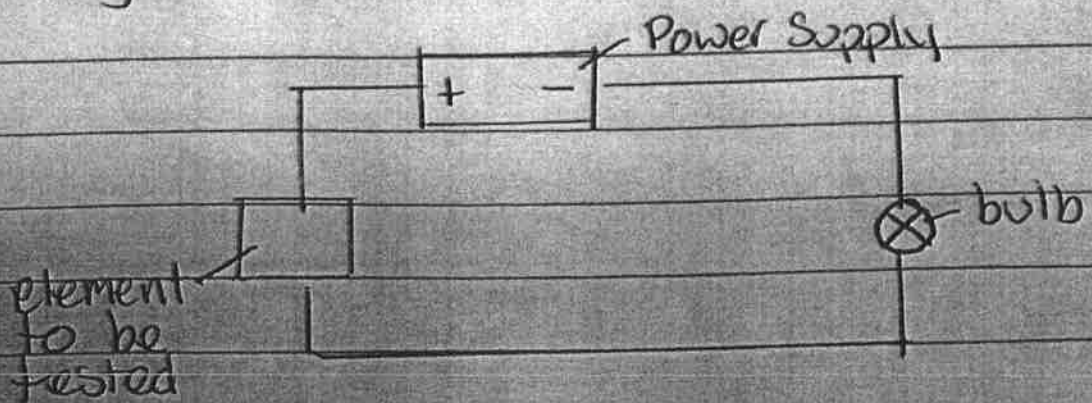
Element	Symbol/ Atomic Number	Appearance/ Property	Use
Sulfur	S / 16	Yellow ^{dull} solid	Chemical React
Gold	Au / 79	Yellow shiny	Jewell
Copper	Cu / 29	Orange shiny	electric wire
Oxygen	O / 8	colourless gas	Breath
Iron	Fe / 26	Silvery shiny	build
Helium	He / 2	colourless gas	ballo
Mercury	Hg / 80	Silvery shiny	thermo
Bromine	Br / 35	Brown liquid	Chemical React
Carbon	C / 6	Black solid	electr
Zinc	Zn / 30	Silvery shiny	galva

observations
by pupil

reference
to data
booklet

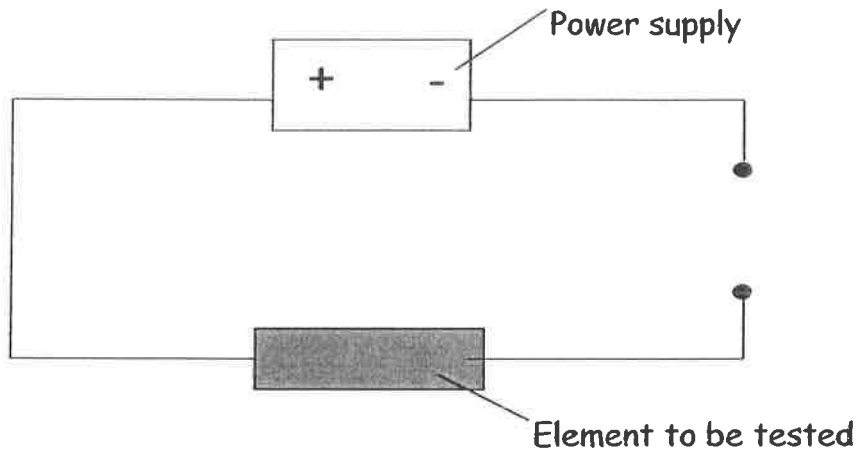
Testing elements for conductivity

↓
discussion
in
group



Evidence 1

5.



- a) On the diagram, the student has left out the piece of apparatus used to show if the elements conducts. Name the piece of apparatus which has been left out.

Bulb.

1

- b) Complete the results table for the two elements shown.

Element	Metal/Non-metal	Conductor/ Non- conductor
Carbon (graphite)	non-metal	conductor
Gallium	metal	conductor

sci.

2

6. The table shows some weights when 3 substances are heated in air.

Substance	Weight before heating (g)	Weight after heating (g)
X	2.5	2.8
Y	2.2	1.8
Z	2.6	2.6

- a) Which substance (X, Y or Z) is not affected by heating? Z

1

- b) When zinc carbonate is heated, it gives out carbon dioxide gas. Which substance is zinc carbonate? Y

1

- c) When magnesium is heated in air, it combines with oxygen. Which letter represents the substance magnesium? X

1

Q1

Element	Bulb lit Y/N	experiment carried out safely
Sulfur	N	
Gold	Y	
Copper	Y	
Helium	N	
Iron	Y	
Oxygen	N	
Zinc	Y	
Carbon (graphite)	Y	

Conclusion - All metals conduct electricity since the bulb lit when metals were put in the circuit.

Carbon is a non-metal but conducted electricity. All other non-metals did not conduct electricity.

Metals are suitable for electrical wires since they conduct electricity.

Evidence 1

Lesson Starter

1. Explain what is meant by an element ?
2. State a property of all metals
3. State the name of the group 1 elements
4. Describe how are elements organised in the Periodic Table?
5. What do we call group 7 elements?
6. What group number in the Periodic Table are the Noble Gases?

Evidence 1

Peer assessed.

6/6

Lesson Starter

⊙

1. An element is a substance made of one type of atom only. ✓ 1
2. All metals conduct electricity ✓ 1
3. The name of the group 1 elements is the Alkali Metals. ✓ 1
4. The Periodic Table organises elements in groups which are vertical columns and periods which are horizontal rows. Elements that react in a similar way are in the same group. ✓ 1
5. The group 7 elements are called the halogens. ✓ 1
6. The Noble Gases are in group 0. ✓ 1

Evidence 2

Grouping Elements

SC2	Group	Name	Properties
	1	Alkali Metals	Reactive metals
	7	Halogens	Reactive non-metals
	0	Noble gases	Inert gases

Blank table given is provided to complete
learner has achieved this outcome

1.1 Elements

1.1.1. Atoms in Elements

This activity is about the idea of atoms and how elements are made from atoms.

All substances are built up of very tiny, round particles called atoms.

An element is made up of one type of atom.

Chemists use symbols to represent elements.

Examples:

Some element symbols are single letters.



The letter is always a capital letter.

Element	Symbol
Oxygen	O
Hydrogen	H
Potassium	K
Tungsten	W

Some element symbols have two letters:



The first letter is always a capital and the second letter is always lower case.

Element	Symbol
Helium	He
Lithium	Li
Copper	Cu
Silver	Ag

The symbols for some elements, like iron (Fe), are based on the latin word for the element.

Others like this include gold (Au), lead (Pb) and sodium (Na).

There are over 100 elements and these are listed in the Periodic Table.

Evidence 2

Lesson Starter

1. Explain what is meant by a compound?
2. State a property of all metals.
3. Give the name of the compound made when copper reacts with chlorine.
4. What evidence is there that a chemical reaction took place when copper and chlorine reacted together.

Evidence 2.

~~not assessed~~

4/4.

Lesson Starter

1. A compound is when two or more elements are chemically joined ✓ 1
- 1.2 All metals conduct electricity ✓ 1
- 3.4.3 Copper and chlorine react to make copper chloride. ✓ 1
- 4 There is an energy change when copper and chlorine reacts ✓ 1

Extra 5

Chemical Reactions

GC3 Copper is an element - all atoms are the same

Chlorine is an element - all the atoms are the same.

Teacher Demo

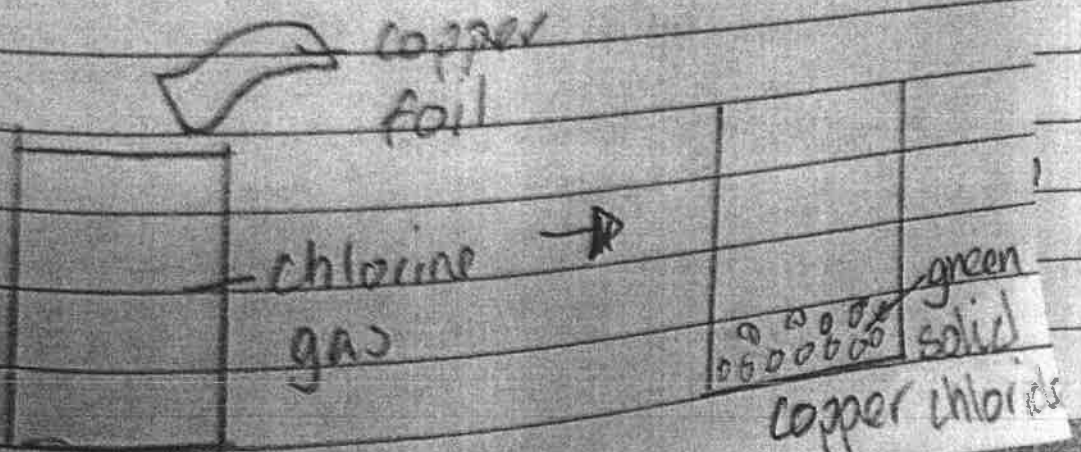
The teacher put a piece of copper foil into a flask of chlorine gas.

Observations at start

The copper foil was shiny and the chlorine was a yellowish green gas

Observations at end

There was heat and light given out and the new substance was a green solid.



2002

Breaking up compounds

Energy was released when copper reacted with chlorine.

Energy needs to be put in to break up copper chloride

Electricity is used to break up compounds. This is called electrolysis when a solution or melted compound is broken up by passing electricity through it.

To break up copper chloride into the elements copper and chlorine and to identify the elements after electrolysis

Teacher Demo.

3 Hydrogen is a colourless gas.

Oxygen is a colourless gas.

Teacher led note.

The teacher mixed hydrogen and oxygen in a plastic bottle.

The bottle was placed on a string across the class.

pupil wrote method.

The teacher sparked the bottle

Observations

A loud bang sounded and the bottle flew across the string.

A clear liquid appeared in the bottle at the end. This is water.

Pupil observations

hydrogen + oxygen \rightarrow hydrogen oxide
(water).

correct word equation based on experiment.

Evidence 3

Lesson Starter

1. When copper and chlorine react they form copper chloride.
Describe the difference in properties of the reacting elements to the product formed.
2. Write the word equation for the following reactions:
 - a. When copper chloride is electrolysed.
 - b. When hydrogen and oxygen react.
3. State the state of sodium at 100 °C

Evidence 3

Peer assessed

4/4

Lesson Starter

gc31. Copper is a metal and looks orange and shiny and conducts electricity. Chlorine is a gas which smells like a swimming pool. When they react copper chloride is formed which is a green solid and does not conduct electricity when solid. It looks different from the elements. ✓

2 a) copper chloride → copper + chlorine ✓
SC5

gc4
SC5 b) hydrogen + oxygen → hydrogen oxide ✓

3
SC8 bp 883°C

mp 98°C

100°C liquid

It is a liquid at ~~100°C~~
100°C ✓

NAMING COMPOUNDS

Name the compound made from the following elements

1. a) Carbon and chlorine
- b) Silver and iodine
- c) Aluminium and oxygen
- d) Potassium and sulphur
- e) Vanadium and phosphorous

Name the elements present in the following compounds

2. a) Calcium carbonate
- b) Silver sulphate
- c) Gold phosphate
- d) Carbon chlorate
- e) Radium bromate

Name the compounds made from the following elements

3. a) Sodium, carbon and oxygen
- b) Gold, sulphur and oxygen
- c) Lithium, phosphorous and oxygen
- d) Silver, bromine and oxygen
- e) Copper, carbon and oxygen

Evidence 4

SC 4 Naming Compounds

1a Carbon and chlorine make carbon chloride

SC 5 carbon + chlorine \rightarrow carbon chloride

2b Silver and iodine make silver iodide

SC 5 silver + iodine \rightarrow silver iodide

1c Aluminium and oxygen make aluminium oxide

SC 5 Aluminium + oxygen \rightarrow aluminium oxide

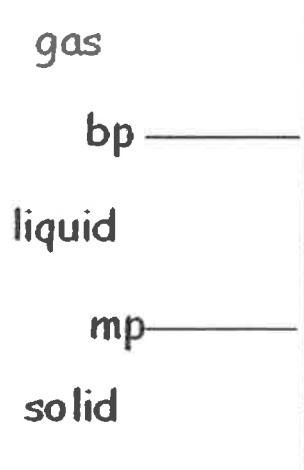
Pupil has achieved SC 4. based on worksheet questions.

Evidence 6

1.1.2. Grouping Elements

The state of an element can be determined at a given temperature.

State of Elements at different Temperatures



1. At 40°C phosphorus is in the _____ state
2. At -150°C oxygen is in the _____ state
3. Argon is in the _____ state at -180°C
4. Gallium is in the _____ state at room temperature (25°C)
5. Helium is in the _____ state at -270°C

Evidence 6

SC 8 States of Elements

SC 8
overtaken

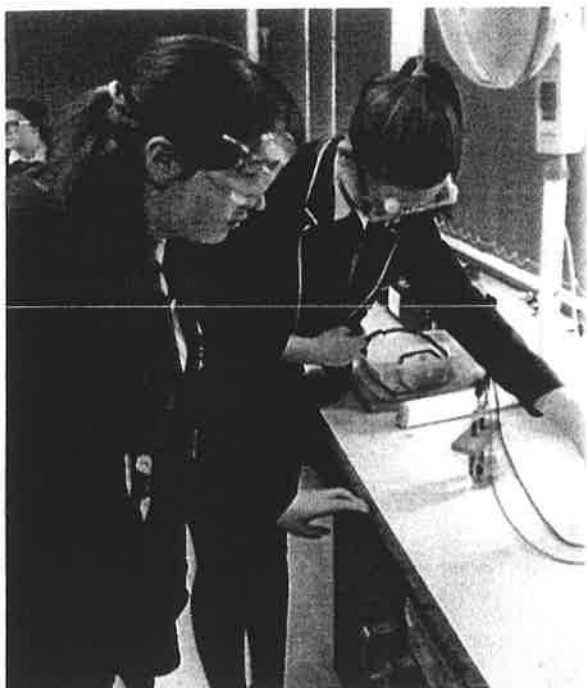
Melting and boiling points in the data booklet used to find states of elements at given temperatures.

gas
bp
liquid
mp
solid

1. <u>P</u> at 40°C	<u>O</u> at -150°C	<u>Ar</u> at -180°C
bp -280	bp -183 <u>gas</u>	bp -186 <u>gas</u>
mp 44	mp -219	mp -189
solid 40°C <u>solid</u>		

<u>Ga</u> at 25°C	<u>He</u> at -270°C
bp 2204	bp -269
mp 30	mp -272
25°C <u>solid</u>	-270°C <u>liquid</u>

S.C. 6. Safely carry out practical experiment.



*Pupil X worked
safely and followed
instructions.*