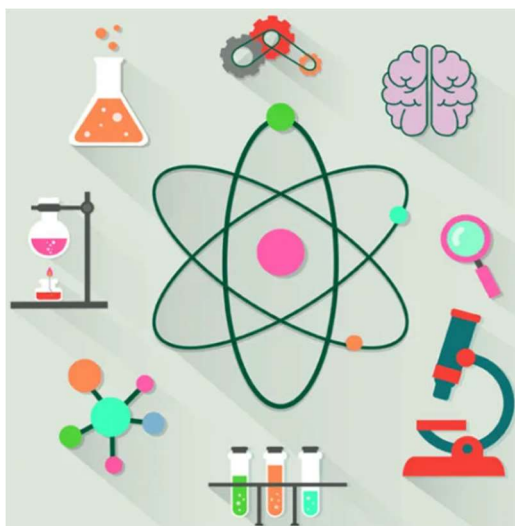




Kirkcaldy High School



BGE Science

The Periodic Table

Name: _____

Class: _____

Teacher: _____

Expectations and Outcomes Learner Evaluation

Topic: The Periodic Table

Experience and Outcomes	Date Completed (dd/mm/yy)	Evaluation How happy are you with it? (☺ ? ☹)
I can state that the periodic table organises elements by atomic number.		
I can state an element as being made of one type of atom.		
I can write symbols for elements using the periodic table.		
I can state that the metal elements are found on the left-hand side of the periodic table.		
I can state that the non-metal elements are found on the right-hand side of		
I can describe a group as a vertical column in the periodic table.		
I can describe a period as a horizontal row in the periodic table.		
I can name groups 1,7 and 8.		
I can state that metals are conductors of heat and electricity.		
I can state that metals are strong.		
I can state that metals have different reactivities.		
I can identify patterns of reactivity.		
I can state that some metals react with acids		
I can state that some reactive metals react with acids		
I can state that less reactive metals will not react with acids.		

Periodic Table of the Elements

Column 1
2

1 Hydrogen H	4 Beryllium Be
3 Lithium Li	12 Magnesium Mg
11 Sodium Na	20 Calcium Ca
19 Potassium K	38 Strontium Sr
37 Rubidium Rb	56 Barium Ba
55 Caesium Cs	88 Radium Ra

Column 3
4
5
6
7
0

2 Helium He						9 Fluorine F	10 Neon Ne
	5 Boron B	6 Carbon C	7 Nitrogen N	8 Oxygen O			
	13 Aluminium Al	14 Silicon Si	15 Phosphorus P	16 Sulfur S	17 Chlorine Cl	18 Argon Ar	
	31 Gallium Ga	32 Germanium Ge	33 Arsenic As	34 Selenium Se	35 Bromine Br	36 Krypton Kr	
	49 Indium In	50 Tin Sn	51 Antimony Sb	52 Tellurium Te	53 Iodine I	54 Xenon Xe	
	81 Thallium Tl	82 Lead Pb	83 Bismuth Bi	84 Polonium Po	85 Astatine At	86 Radon Rn	
	113 Nihonium Nh	114 Flerovium Fl	115 Moscovium Mc	116 Livermorium Lv	117 Tennessine Ts	118 Oganesson Og	

Key

Atomic Number
Name of Element
Symbol

TRANSITION METALS

21 Scandium Sc	22 Titanium Ti	23 Vanadium V	24 Chromium Cr	25 Manganese Mn	26 Iron Fe	27 Cobalt Co	28 Nickel Ni	29 Copper Cu	30 Zinc Zn
39 Yttrium Y	40 Zirconium Zr	41 Niobium Nb	42 Molybdenum Mo	43 Technetium Tc	44 Ruthenium Ru	45 Rhodium Rh	46 Palladium Pd	47 Silver Ag	48 Cadmium Cd
57 Lanthanum La	58-71 ●	72 Hafnium Hf	73 Tantalum Ta	74 Tungsten W	76 Osmium Os	77 Iridium Ir	78 Platinum Pt	79 Gold Au	80 Mercury Hg
89 Actinium Ac	90-103 ■	104 Rutherfordium Rf	105 Dubnium Db	106 Seaborgium Sg	108 Hassium Hs	109 Meitnerium Mt	110 Darmstadtium Ds	111 Roentgenium Rg	112 Copernicium Cn

Date _____

58 Cerium Ce	59 Praseodymium Pr	60 Neodymium Nd	61 Promethium Pm	62 Samarium Sm	63 Europium Eu	64 Gadolinium Gd	65 Terbium Tb	66 Dysprosium Dy	67 Holmium Ho	68 Erbium Er	69 Thulium Tm	70 Ytterbium Yb	71 Lutetium Lu
90 Thorium Th	91 Protactinium Pa	92 Uranium U	93 Neptunium Np	94 Plutonium Pu	95 Americium Am	96 Curium Cm	97 Berkelium Bk	98 Californium Cf	99 Einsteinium Es	100 Fermium Fm	101 Mendelevium Md	102 Nobelium No	103 Lawrencium Lr

Elements below the dark line are metals.

The Periodic Table

Starter

1. What do you know about the Periodic table?

2. Name any elements that you have heard of.

3. Describe what your elements are used for

Learning Intentions

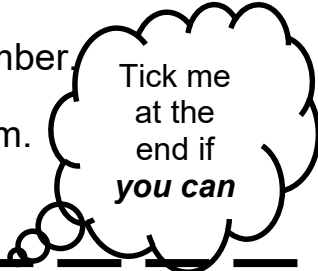
- To learn that the periodic table organises elements by atomic number.
- To understand that an element is made of one type of atom.
- To learn to write symbols for elements using the periodic table.

Success Criteria

☐ I can state that the periodic table is organised by atomic number.

☐ I can describe an element as being made of one type of atom.

☐ I can write symbols for elements using the periodic table.



Tick me
at the
end if
you can

The Periodic Table

The Periodic table of elements contains all of the elements in the world. It was put together by a Russian Chemist Dimitri Mendeleev.

Everything in the world is made of the 118 _____ in the Periodic table.

The elements are arranged by _____.

Visit the large Periodic Table upstairs in Science, or use the QR code to find the uses of some elements.



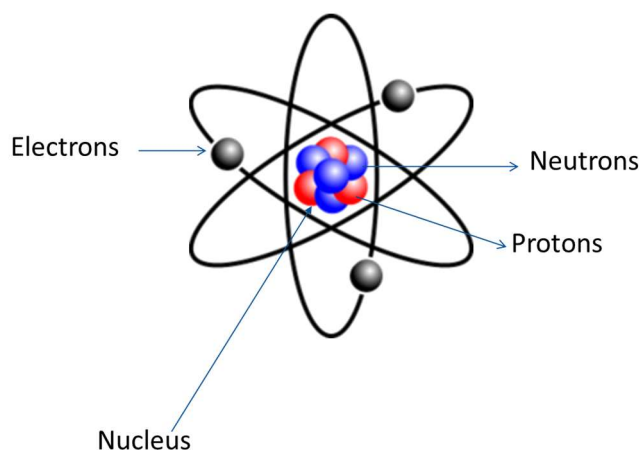
Element	Use

Elements & Atoms

An _____ is a substance made up of only one type of _____.

Everything that exists is made of _____. An atom is the basic building block of any material.

An atom was originally thought to be the smallest unit of matter, but Scientific research has shown they are made up of even smaller particles.



Element Symbols

- Each element has its own **unique** symbol.
- The first letter in the symbol must be CAPITAL letter.
- If there is a second letter in the symbol, this must be lower case.
- For Example, the symbol for Helium is He.

Questions

- Use the Periodic table and write down the symbol for:

Oxygen _____

Helium _____

Magnesium _____

Lithium _____

Hydrogen _____

A few elements have symbols that come from the Latin name for the element.

- Write the symbol for:

Silver _____

Gold _____

Iron _____

Activity – Matching elements to their Symbol

Use your Periodic Table to match the name and symbol. Circle the element name and connect to the *correct symbol*. Watch out for sneaky ones!

The word search contains the following elements and symbols:

- Magnesium** (circled) connected to **Mg** (circled)
- Chlorine**
- Lead**
- Copper**
- Sodium**
- Cobalt**
- Gallium**
- Sulphur**
- Potassium**
- Phosphorous**
- Gold**
- Tin**
- Oxygen**
- Chlorine**
- S**
- Cl**
- P**
- Cu**
- K**
- Ga**
- Mn**
- Na**
- Co**
- Pb**
- Au**
- O**

Plenary – Element Bingo

Write 6 elements from elements with atomic number 1-20.

The Periodic Table

Starter:

Use the periodic table to help you answer the following questions:

1. Write the symbol for sulfur _____
2. Write the symbol for Sodium? _____
3. Which element has the symbol O? _____
4. Is HE the correct symbol for Helium? _____

Learning Intentions

To learn:

- about ways elements can be categorised in the Periodic table.
- about the position of metal and non-metals elements in the periodic table.
- The names for groups 1, 7 and 8.

Success Criteria

- ☐ I can state that metal elements are found on the left hand side of the periodic table.
 - ☐ I can state that the non-metal elements are found on the right hand side of the periodic table.
 - ☐ I can use the periodic table to find information about elements.
 - ☐ I can name groups 1, 7 and 8.
-

Categorising Elements

The elements can be categorised in different ways. For example:

- Metals and non-metals
- Solids, liquids and gases

Scan the QR code to identify the metals and non-metals in the table.

Or use the laminated periodic table to identify the metals and non-metals in the table on the next page.



Element	Metal/non-metal	Solid/liquid/gas
Oxygen		
Aluminium		
Sodium		
Helium		
Bromine		
Mercury		
Hydrogen		

Use the Period table with solid, liquid, gas categorisation to help you identify the state of matter each element exists in at room temperature.

Groups & Periods in the Periodic Table

In the Periodic Table, each row is called a _____ and each column is called a _____.

Colour in groups 1, 7 & 8

1

2

3

4

5

6

7

8

1

Hydrogen

H

3

Lithium

Li

4

Beryllium

Be

11

Sodium

Na

12

Magnesium

Mg

19

Potassium

K

20

Calcium

Ca

37

Rubidium

Rb

38

Strontium

Sr

55

Caesium

Cs

56

Barium

Ba

87

Francium

Fr

88

Radium

Ra

21

Scandium

Sc

22

Titanium

Ti

23

Vanadium

V

24

Chromium

Cr

25

Manganese

Mn

26

Iron

Fe

27

Cobalt

Co

28

Nickel

Ni

29

Copper

Cu

30

Zinc

Zn

40

Zirconium

Zr

41

Niobium

Nb

42

Molybdenum

Mo

43

Technetium

Tc

44

Ruthenium

Ru

45

Rhodium

Rh

46

Palladium

Pd

47

Silver

Ag

48

Cadmium

Cd

57

Lanthanum

La

58-71

72

Hafnium

Hf

73

Tantalum

Ta

74

Tungsten

W

75

Rhenium

Re

76

Osmium

Os

77

Iridium

Ir

78

Platinum

Pt

79

Gold

Au

80

Mercury

Hg

89

Actinium

Ac

90-103

104

Rutherfordium

Rf

105

Dubnium

Db

106

Seaborgium

Sg

107

Bohrium

Bh

108

Hassium

Rs

109

Meitnerium

Mt

110

Darmstadtium

Ds

111

Roentgenium

Rg

112

Cn

31

Aluminum

Al

32

Silicon

Si

33

Phosphorus

P

34

Sulfur

S

35

Chlorine

Cl

36

Argon

Ar

49

Indium

In

50

Tin

Sn

51

Antimony

Sb

52

Tellurium

Te

53

Iodine

I

54

Xenon

Xe

81

Thallium

Tl

82

Lead

Pb

83

Bismuth

Bi

84

Polonium

Po

85

Astatine

At

86

Radon

Rn

114

Flerovium

Fl

116

Livermorium

Lv

5

Boron

B

6

Carbon

C

7

Nitrogen

N

8

Oxygen

O

9

Fluorine

F

10

Neon

Ne

13

Aluminum

Al

14

Silicon

Si

15

Phosphorus

P

16

Sulfur

S

17

Chlorine

Cl

18

Argon

Ar

31

Gallium

Ga

32

Germanium

Ge

33

Arsenic

As

34

Selenium

Se

35

Bromine

Br

36

Krypton

Kr

49

Indium

In

50

Tin

Sn

51

Antimony

Sb

52

Tellurium

Te

53

Iodine

I

54

Xenon

Xe

81

Thallium

Tl

82

Lead

Pb

83

Bismuth

Bi

84

Polonium

Po

85

Astatine

At

86

Radon

Rn

114

Flerovium

Fl

116

Livermorium

Lv

2

Helium

He

10

Neon

Ne

18

Argon

Ar

36

Krypton

Kr

54

Xenon

Xe

86

Radon

Rn

1

Hydrogen

H

2

Helium

He

3

Lithium

Li

4

Beryllium

Be

5

Boron

B

6

Carbon

C

7

Nitrogen

N

8

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O

9

Fluorine

F

10

Neon

Ne

11

Sodium

Na

12

Magnesium

Mg

13

Aluminum

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Silicon

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S

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Argon

Ar

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Potassium

K

20

Calcium

Ca

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Scandium

Sc

22

Titanium

Ti

23

Vanadium

V

24

Chromium

Cr

25

Manganese

Mn

26

Iron

Fe

27

Cobalt

Co

28

Nickel

Ni

29

Copper

Cu

30

Zinc

Zn

31

Gallium

Ga

32

Germanium

Ge

33

Arsenic

As

34

Selenium

Se

35

Bromine

Br

36

Krypton

Kr

37

Rubidium

Rb

38

Strontium

Sr

39

Yttrium

Y

40

Zirconium

Zr

41

Niobium

Nb

42

Molybdenum

Mo

43

Technetium

Tc

44

Ruthenium

Ru

45

Rhodium

Rh

46

Palladium

Pd

47

Silver

Ag

48

Cadmium

Cd

49

Indium

In

50

Tin

Sn

51

Antimony

Sb

52

Tellurium

Te

53

Iodine

I

54

Xenon

Xe

55

Caesium

Cs

56

Barium

Ba

57

Lanthanum

La

58-71

72

Hafnium

Hf

73

Tantalum

Ta

74

Tungsten

W

75

Rhenium

Re

76

Osmium

Os

77

Iridium

Ir

78

Platinum

Pt

79

Gold

Au

80

Mercury

Hg

81

Thallium

Tl

82

Lead

Pb

83

Bismuth

Bi

84

Polonium

Po

85

Astatine

At

86

Radon

Rn

87

Francium

Fr

88

Radium

Ra

89

Actinium

Ac

90-103

104

Rutherfordium

Rf

105

Dubnium

Db

106

Seaborgium

Sg

107

Bohrium

Bh

108

Hassium

Rs

109

Meitnerium

Mt

110

Darmstadtium

Ds

111

Roentgenium

Rg

112

Cn

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Nihonium

Nh

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Flerovium

Fl

115

Moscovium

Mc

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Livermorium

Lv

117

Tennessine

Ts

118

Oganesson

Og

1

Hydrogen

H

2

Helium

He

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Lithium

Li

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Barium

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Lanthanum

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Hafnium

Hf

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Tantalum

Ta

74

Tungsten

W

75

Rhenium

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Osmium

Os

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Iridium

Ir

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Platinum

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Gold

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Mercury

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Thallium

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Bismuth

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Polonium

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Francium

Fr

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Radium

Ra

89

Actinium

Ac

90-103

104

Rutherfordium

Rf

105

Dubnium

Db

106

Seaborgium

Sg

107

Bohrium

Bh

108

Hassium

Rs

109

Meitnerium

Mt

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Darmstadtium

Ds

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Roentgenium

Rg

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Cn

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Nihonium

Nh

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73

Tantalum

Ta

74

Tungsten

W

75

Rhenium

Re

76

Osmium

Os

77

Iridium

Ir

78

Platinum

Pt

79

Gold

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Polonium

Po

85

Astatine

At

86

Radon

Rn

87

Francium

Fr

88

Radium

Ra

89

Actinium

Ac

90-103

104

Rutherfordium

Rf

105

Dubnium

Db

106

Seaborgium

Sg

107

Bohrium

Bh

108

Hassium

Rs

109

Meitnerium

Mt

110

Darmstadtium

Ds

111

Roentgenium

Rg

112

Cn

113

Nihonium

Nh

114

Flerovium

Fl

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Moscovium

Mc

116

Livermorium

Lv

117

Tennessine

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Oganesson

Og

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Hydrogen

H

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Helium

He

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Lithium

Li

4

Beryllium

Be

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Boron

B

6

Carbon

C

7

Nitrogen

N

8

Oxygen

O

9

Fluorine

F

10

Neon

Ne

11

Sodium

Na

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Magnesium

Mg

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Silicon

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Phosphorus

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44

Ruthenium

Ru

45

Rhodium

Rh

46

Palladium

Pd

47

Silver

Ag

48

Cadmium

Cd

49

Indium

In

50

Tin

Sn

51

Antimony

Sb

52

Tellurium

Te

53

Iodine

I

54

Xenon

Xe

55

Caesium

Cs

56

Barium

Ba

57

Lanthanum

La

58-71

72

Hafnium

Hf

73

Tantalum

Ta

74

Tungsten

W

75

Rhenium

Re

76

Osmium

Os

77

Iridium

Ir

78

Platinum

Pt

79

Gold

Au

80

Mercury

Hg

81

Thallium

Tl

82

Lead

Pb

83

Bismuth

Bi

84

Polonium

Po

85

Astatine

At

86

Radon

Rn

87

Francium

Fr

88

Radium

Ra

89

Actinium

Ac

90-103

104

Rutherfordium

Rf

105

Dubnium

Db

106

Seaborgium

Sg

107

Bohrium

Bh

108

Hassium

Rs

109

Meitnerium

Mt

110

Darmstadtium

Ds

111

Roentgenium

Rg

112

Cn

113

Nihonium

Nh

114

Flerovium

Fl

115

Moscovium

Mc

116

Livermorium

Lv

117

Tennessine

Ts

118

Oganesson

Og

1

Hydrogen

H

2

Helium

He

3

Lithium

Li

4

Beryllium

Be

5

Boron

B

6

Carbon

C

7

Nitrogen

N

8

Oxygen

O

9

Fluorine

F

10

Neon

Ne

11

Sodium

Na

12

Magnesium

Mg

13

Aluminum

Al

14

Silicon

Si

15

Phosphorus

P

16

Sulfur

S

17

Chlorine

Cl

18

Argon

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Iron

Fe

27

Cobalt

Co

28

Nickel

Ni

29

Copper

Cu

30

Zinc

Zn

31

Gallium

Ga

32

Germanium

Ge

33

Arsenic

As

34

Selenium

Se

35

Bromine

Br

36

Krypton

Kr

37

Rubidium

Rb

38

<

Key:

☐ alkali metals

☐ **halogens**

☐ noble gases

Plenary

Use your coloured in Periodic table in your booklet to help you answer these questions. Circle the error and make the correction.

Example: hydrogen has the symbol h and is a gas.

1. Nitrogen has the symbol N and is a metal element.
2. Carbon has the symbol ca and is a non-metal element.
3. Lithium has the symbol li and is a metal element.
4. Sodium has the symbol Na and is a Nobel gas

☐ I can name groups 1,7 and 8.

Reactivity of Metals

Starter

Using your periodic table:

1. Give an example of a metal. _____
2. Give an example of a non-metal gas. _____
3. Give an example of a liquid metal. _____
4. Write symbol for each of your elements _____

Learning Intentions:

To learn about the different reactivity of metals with water.

Success Criteria

- ☐ I can state that metals have different reactivities.
- ☐ I can perform an experiment safely.
- ☐ I can describe my observations in an experiment.

Reactivity of Metals with Water

One way that we can experimentally show that metals have different _____ is to react them with water and compare the results.

Think about the metals you use at home that come into contact with water. Do you see them react? List some examples:

Aim _____

Method**Results**

Metal	Observation	Order of reactivity
copper		
iron		
zinc		
magnesium		
Calcium		
lithium		
sodium		
potassium		

Conclusion

Evaluation

Reactivity of Metals with Acids

Starter

- 1) Why is jewellery made from silver and gold?
- 2) Why are your water pipes not made from gold?
- 3) Why do you think magnesium is not a good metal to make the forth road bridge?

Learning Intentions:

- To learn about the reactivity of metals with acid.

Success Criteria

- ☐ I can state that some metals react with acids.

Reactivity of Metals with Acids

Aim _____

Method

Results

Metal	Observations	Order of Reactivity
Magnesium		
Zinc		
Iron		
Copper		

Conclusion

Evaluation

Plenary

Predict what if Sodium was reacted with acid

Word equations extension

hydrochloric acid + Copper	→	Copper chloride	+	Hydrogen
Hydrochloric acid + Iron	→	_____	+	Hydrogen
Hydrochloric acid + Magnesium	→	_____	+	_____

Properties of Elements

Starter – true or false

1. Copper makes a good electrical wire because it can conduct electricity. _____
2. Sodium would make a poor cooking pot because it is so reactive. _____
3. Potassium makes a good metal for jewellery because its unreactive _____

Learning Intentions

- To learn about conductivity of different materials.

Success Criteria

- ☐ I can state that an element is composed of only 1 type of atom.
- ☐ I can state that a mixture is composed of two or more substances that are not chemically linked.

Conductivity

One way in which elements can be classified is by their ability to conduct electricity.

Conductors of electricity have uses in _____, _____, _____.

_____ do not conduct electricity.

Aim _____

Method

Results

Conductors	Non-Conductors

Conclusion

Plenary

Complete the passage

_____ are good conductors of electricity. Metals can be found on the _____ side of the periodic table. _____ are not conductors of electricity, these are described as _____. These are found on the _____ side of the periodic table. The exception to this is _____ with is a conductor.

Word Bank

Left Right Graphite Non-metal Metal Insulators

Identifying elements

Starter

- 1) Using your knowledge from previous lessons, predict which metals will react with Oxygen.
-
-

- 2) Complete the word equation:

Magnesium + hydrochloric acid → Magnesium Chloride + hydrogen

- 3) Describe how you could prove that Hydrogen was produced.
-
-

Learning Intentions

- To learn that when elements are burned, they produce specific colours in the flame. The colours can be used to identify the element.

Success Criteria

- ☐ I can use flame colours to identify elements.
-

Identifying elements

When elements are burned, they produce specific colours. The colours they produce can be used to identify the element. Astronomers use a similar technique to identify which elements are present in distant stars.

Flame Tests

Aim _____

Method

Results

Metal	Colour
Magnesium	
Barium	
Sodium	
Copper	
Potassium	
Calcium	
Unknown 1	
Unknown 2	

Conclusion

Elements Compounds and Mixtures

Starter:

1. What is the name of the “chart” that shows all the known elements?
2. Why is this “chart” laid out in a particular way?
3. What term describes a vertical column?

Learning Intentions

- To learn about elements, compounds and mixtures and the differences between them.

Success Criteria

- ☐ I can state that an element is composed of only 1 type of atom.
 - ☐ I can state that a mixture is composed of two or more substances that are not chemically linked.
-

Elements

An element is a substance made up of only one type of atom.

Elements are found in the _____ Table.

Compounds

Contains atoms that are chemically _____.

Mixture

Contains atoms or compounds that are mixed but _____ chemically joined together.

Question	Element, Compound or Mixture
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

Separating Mixtures

Mixtures contain 2 or more substances that are **not** _____
_____.

Mixtures can be separated _____ as the atoms are not chemically joined.



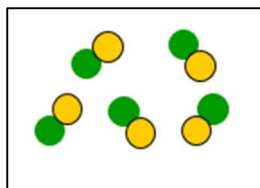
Activity: Collect a tube containing an iron and sulfur mixture and a magnet.

Describe what happens when the magnet is close to the mixture.

Compounds

Starter:

1. Does this particle diagram show an element, compound or a mixture?



2. Explain your answer to question 1.
-
-

Learning Intentions

- To learn that compounds are made of elements that are chemically linked to each other.
- Compounds cannot be separated into their parts easily.

Success Criteria

- ☐ I can state that a compound is made of two or more elements that are chemically connected to each other.
 - ☐ I can state that compounds are not easily separated in their parts.
-

Making a Compound

Making a compound often needs energy to make the elements _____ and _____ to each other.

Draw a particle diagram for the reaction of two elements forming a compound.

Making a Compound

Aim

Method

Results

Metal	Observations
Magnesium	
Copper	

Conclusion

Naming Compounds

Starter:

Magnesium costs £3.00 per meter. One meter of Magnesium can be cut into 20 x 5cm strips.

1. Calculate the cost per strip (you can use a calculator).
2. Calculate the cost if 240 strips are needed by the science department.

Learning Intentions

- ☐ To learn how to name elements in compounds.

Success Criteria

- ☐ I can name a compound made from 2 elements.
- I can name a compound made from 3 elements where one element is oxygen

Naming Compounds

Compounds containing two elements end with -ide

Metal name goes first, followed by the non-metal element. The non-metal element takes the ending ide.

Example:

Compound

lithium chloride

magnesium oxide

Elements

lithium and chlorine

magnesium and oxygen

Name the following Compounds

Element 1	Element2	Name of compound
iron	sulphur	
magnesium	nitrogen	
sodium	chlorine	
tin	oxygen	
aluminium	bromine	
nickel	iodine	
zinc	sulphur	
lithium	nitrogen	

Identify the elements in the following compounds?

1. Sodium fluoride _____ + _____
2. Lithium bromide _____ + _____
3. Calcium oxide _____ + _____
4. Aluminium chloride _____ + _____
5. Phosphorus sulphide _____ + _____
6. Caesium chloride _____ + _____

Naming Compounds with 3 Elements

Compounds containing two element AND oxygen end in -ite or –ate

First part of the name comes from the metal, then the non-metal, then add the suffix ate at the end for Oxygen.

Example: copper sulfate is made from copper, sulfur and oxygen

Element 1	Element 2	Element 3	Name of Compound
Sodium	Sulfur	Oxygen	Sodium Sulfate
Potassium	Nitrogen	Oxygen	
Sodium	Sulfur	Oxygen	
Beryllium	Phosphorus	Oxygen	
Aluminium	Chlorine	Oxygen	
Phosphorus	Oxygen	Sulfur	
Caesium	Nitrogen	Oxygen	
Oxygen	Copper	Sulfur	

Which elements are in the following compounds?

1. Sodium nitrate _____ + _____ + _____

2. Lithium sulphate _____ + _____ + _____

3. Calcium phosphate _____ + _____ + _____

4. Aluminium chlorate _____ + _____ + _____

5. Phosphorus sulphite _____ + _____ + _____

Plenary

Elements in the compound	Compound Name
Sodium, chlorine	
Beryllium, oxygen	
Potassium, Nitrogen, oxygen	

Elements in the compound	Compound Name
	Magnesium fluoride
	Zinc oxide
	Copper sulfate

Separating Compounds

Starter

Name the compound made from the following elements?

1. Sodium and chlorine _____
2. Iron and nitrogen _____
3. Magnesium, sulfur and oxygen _____
4. Copper, nitrogen and oxygen _____

Learning Intentions

- To learn about different techniques to separate compounds.

Success Criteria

- ☐ I can state that it is not easy to separate compounds into elements.
 - ☐ Energy is often need to break apart elements in a compound.
-

Separating Compounds

The connections between elements in a compound are called _____
_____.

These are strong and often require _____ to be used to break these connections. The energy can be supplied as heat, light or _____.

Aim

To find out if Copper Chloride can be separated into the elements copper and chlorine using electricity.

Method *Draw and label method.*

Results

	Observations	
	Before the experiment	After the experiment
POSITIVE carbon rod		
NEGATIVE carbon rod		

Conclusion

Evaluation

Plenary

1. Complete the word equation:

Copper chloride $\longrightarrow$ _____ + Chlorine

2. Identify the compound in the word equation _____

3. Identify the elements. _____

4. Is it easy to break apart compounds? _____

Purification Techniques

Starter

1. How would you separate salt from sea water?
2. How would you separate sand from sea water?
3. Describe the meaning of the word soluble.
4. Describe the meaning of the word insoluble.

Learning Intentions

- To learn how to use different separation techniques.
- To plan your own experiment
- To safely perform an experiment.
- To separate salt from salt water.

Success Criteria

- ☐ I can safely perform a filtration experiment.
 - ☐ I can safely perform an evaporation experiment.
-

Purification Techniques

- A pure substance is made up of only _____ component.
- The differences in _____ will determine the method of purification that can be used.
- _____ is used to separate an insoluble solid from a liquid.
- _____ is used to remove a liquid from a soluble solid.

Planning your Investigation

Look at the sample of rock salt.

Test the solubility of the sample in a test tube. Describe what you saw

State the technique that you can use to remove insoluble impurities.

Name the components that remain in solution?

Suggest a way to isolate Sodium chloride (salt) on its own

Experiment

Aim To isolate a pure sample of Sodium chloride (salt) from rock salt.

Method (draw diagrams for each step)

Results

Conclusion

Evaluation

Literacy Task

Carbon Fibre: A Strong, Lightweight Material

Carbon fibre is a special material made up of thin strands of carbon atoms bonded together in a long, thin shape. It's incredibly strong, yet very lightweight, which makes it useful for many different things, from sports equipment to space exploration.

Carbon fibre is produced through a process called "carbonization." First, a polymer called PAN (polyacrylonitrile) is heated to very high temperatures, around 1,000°C to 3,000°C, in an oxygen-free environment. This forms long chains of carbon atoms that are tightly bonded together. These strands are then woven into fabric or combined with a plastic resin to create a solid material.

The reason carbon fibre is so useful is because of its combination of properties:

- **Strength:** Carbon fibre is stronger than steel, but much lighter. This makes it ideal for uses where strength is needed without adding extra weight.
- **Lightweight:** Carbon fibre is about five times lighter than steel, which is one of the key reasons it is used in things like racing cars and aircraft.
- **Durability:** It is resistant to corrosion and wear, meaning it lasts a long time without degrading.
-

Uses of Carbon Fibre

- **Sports Equipment:** Carbon fibre is often used to make things like bicycles, tennis rackets, and golf clubs. It gives these items strength without making them too heavy, helping athletes perform at their best.
- **Cars and Airplanes:** Many high-performance cars and planes use carbon fibre to reduce their weight, allowing them to go faster and be more fuel-efficient.
- **Space Exploration:** NASA and other space agencies use carbon fibre in spacecraft because it's strong and lightweight, which helps keep rockets and satellites from becoming too heavy for launch.

Environmental Considerations

While carbon fibre is a great material for many applications, it is also expensive to make and recycling it can be tricky. Researchers are working on ways to recycle carbon fibre more effectively, which would help make it more sustainable.

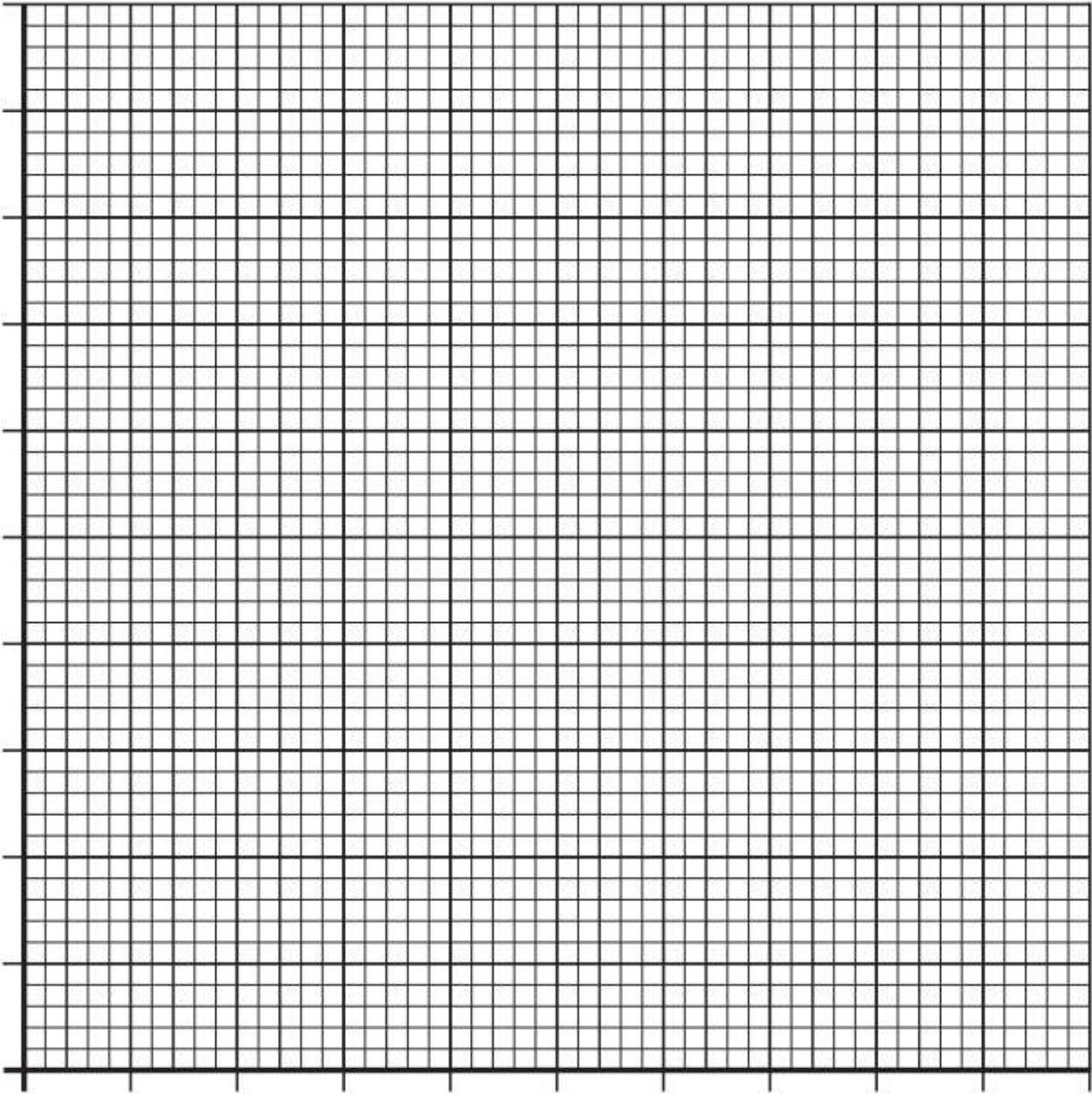
1. Name the process that forms carbon fibre.

2. What are two key properties of carbon fibre that make it useful for various applications?

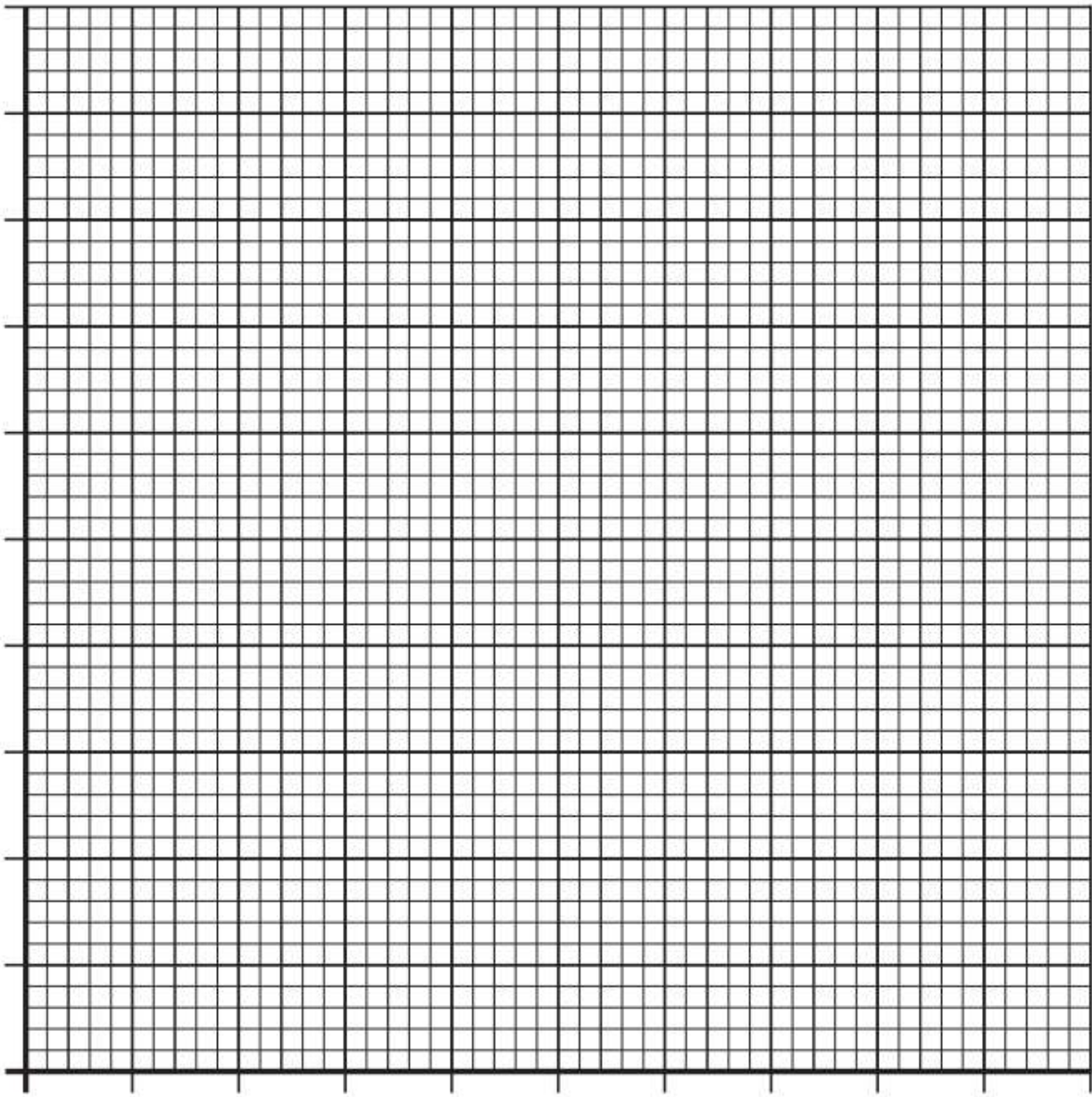
3. Give three examples of items or industries that use carbon fibre and explain why it is beneficial in those cases.

4. Why is carbon fibre considered to be more durable than some other materials?
5. What is one challenge related to carbon fibre that researchers are currently working to improve?

Additional graph paper for numeracy tasks:



Additional graph paper for numeracy tasks:

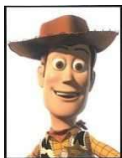


Extension Tasks

L	U	T	E	T	I	U	M	K	J	X	Z	P	S
I	N	D	I	U	M	K	X	W	S	U	D	M	O
V	U	Q	X	P	Z	I	R	I	D	I	U	M	D
E	N	E	P	T	U	N	I	U	M	I	B	J	I
R	T	D	J	F	G	Y	T	W	D	T	N	Z	U
M	R	S	T	W	R	C	H	R	O	M	I	U	M
O	I	W	Z	U	M	K	O	P	W	B	U	W	J
R	U	J	C	U	P	F	P	K	S	X	M	K	R
I	M	R	I	Q	R	H	B	R	O	M	I	N	E
U	E	M	S	E	A	B	O	R	G	I	U	M	L
M	S	B	H	J	H	U	R	A	N	I	U	M	P
O	L	T	I	N	N	E	O	N	K	X	R	W	J
T	U	N	G	S	T	E	N	Z	L	Q	T	Z	S
R	O	E	N	T	G	E	N	I	U	M	K	Q	P

Can you find the following chemical elements in the grid?

LUTETIUM	UNUNTRIUM
TUNGSTEN	LIVERMORIUM
OSMIUM	BORON
MERCURY	SODIUM
URANIUM	CHROMIUM
NEPTUNIUM	BROMINE
RUTHERFORDIUM	INDIUM
DUBNIUM	TIN
SEABORGIUM	IRIDIUM
ROENTGENIUM	NEON



Cartoon Elements

Use the periodic table to find the symbols for the groups of elements below. Each group should spell a different cartoon character

Tungsten, oxygen, oxygen, dysprosium _____

Phosphorus, iodine, nitrogen, nobelium, carbon, hydrogen, iodine, oxygen _____

Rhenium, platinum, argon _____

Sulphur, hydrogen, rhenium, potassium _____

Argon, iodine, aluminium _____

Tin, oxygen, oxygen, phosphorus, yttrium _____

Carbon, hydrogen, iodine, phosphorus _____

Fluorine, lithium, potassium _____

Samarium, iodine, thorium, erbium, sulphur _____

Sulphur, cobalt, oxygen, boron, yttrium _____

Boron, aluminium, oxygen, oxygen _____

Sulphur, lithium, nitrogen, potassium, yttrium _____

Aluminium, iodine, cerium _____

Oxygen, scandium, argon _____

Polonium, calcium, hydrogen, oxygen, nitrogen, tantalum, sulphur _____

Phosphorus, iodine, potassium, actinium, hydrogen, uranium _____

Scandium, radium, technetium, hydrogen, yttrium _____



