Write your name, centre number and candidate number in the boxes below.

Surname	Other names

Centre number | | | | | |

Candidate number | | | | |

STEM | Exam Builder

The Periodic Table

Time allowed: 40 minutes

Subject code **0620**

Chemistry

Questions from Paper 1, Paper 2, Paper 3 and Paper 4

You must have: a ruler marked in centimetres and millimetres, a protractor, compasses, a pen, an HB pencil and an eraser.

Total marks

/ 40

Instructions

- Answer every question in the space provided on this paper.
- Write in black or dark blue ink. Pencil may be used for diagrams and graphs.
- Fill in your name, centre number and candidate number above.
- Show your working: a correct method can earn marks even if the answer is wrong.

Information

- This paper has 10 questions worth 40 marks in total.
- The marks for each question or part are shown in brackets, for example [3].

Advice

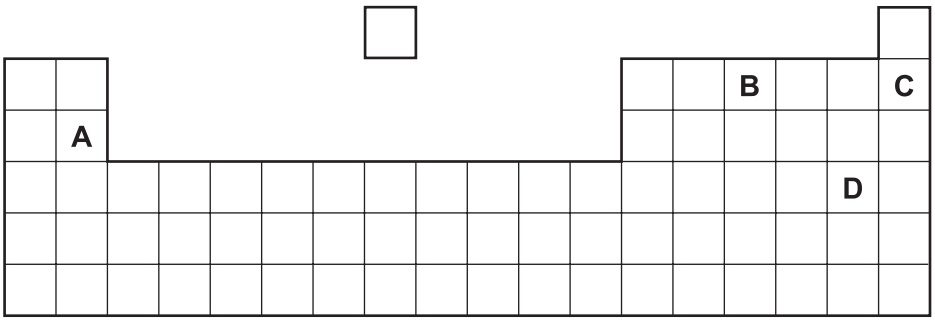
- Read every question through once before you write anything.
- Use the marks in brackets to judge how long to spend on each part.
- If you finish early, go back and check your working.

STEM | Exam Builder

Print at 100% (Actual size) so diagrams keep their real measurements.

1 Part of the Periodic Table is shown.

Which element conducts electricity?



Arrangement of the Periodic Table and trends Click for more variations

2 Elements J and K are in the same period in the Periodic Table.

J reacts with acids to produce a salt and hydrogen.

K reacts with sodium to form an ionic compound.

Which statement about J and K is correct?

A An atom of J has more electrons than an atom of K.

B J and K are both metals.

C J and K are both non-metals.

D J is to the left of K in the Periodic Table.

Arrangement of the Periodic Table and trends Click for more variations

3 Which statement about bromine is correct?

A Bromine has a greater density than chlorine.

B Bromine is a gas at room temperature and pressure.

C Bromine has a grey-black colour.

D Bromine is less reactive than iodine.

Group VII: the halogens Click for more variations

STEM | Exam Builder

4 Some information about an element is shown.

melting point / °C	1555
boiling point / °C	2963
colour of oxide	brown
use of element	as a catalyst

What is the position of this element in the Periodic Table?

A Group I

B Group VII

C Group VIII

D transition elements

Transition elements Click for more variations

5 Lithium and potassium are metals in Group I of the Periodic Table.

Lithium has a melting point of 181 °C and a density of 0.53 g / cm^3.

Which row describes the melting point and density of potassium?

	melting point in °C	density in g / cm^3
A	less than 181	less than 0.53
B	less than 181	greater than 0.53
C	greater than 181	less than 0.53
D	greater than 181	greater than 0.53

Group I: the alkali metals Click for more variations

6 The ions formed when element X and element Y react together are shown.

- Element X forms X^- ions.
- Element Y forms Y^{2+} ions.

Which row identifies the position of X and of Y in the Periodic Table?

	X	Y
A	Group I	Group VI
B	Group VII	Group II
C	Group VII	Group VI
D	Group I	Group II

Arrangement of the Periodic Table and trends Click for more variations

STEM | Exam Builder

7 Table 1.1 gives the electronic configurations of some atoms and ions, **A** to **G**.

Table 1.1

	electronic configuration
A	2,5
B	2,8
C	2,8,2
D	2,8,4
E	2,8,5
F	2,8,6
G	2,8,18,7

Answer the following questions about **A** to **G**.
Each letter may be used once, more than once or not at all.

State which of the atoms or ions, **A** to **G**, could be:

(a) a noble gas atom

..... [1]

(b) an atom of an element in Group VI

..... [1]

(c) an atom with an atomic number of 14

..... [1]

(d) atoms from the same group

..... and ..... [1]

(e) a halogen atom

..... [1]

(f) an atom of an element which is a good conductor of electricity

..... [1]

(g) a stable ion of a Group V element

..... [1]

(h) an atom that forms an ion with a 2– charge.

..... [1]

[Total: 8]

Arrangement of the Periodic Table and trends Click for more variations

STEM | Exam Builder

8 The halogens are the elements in Group VII of the Periodic Table.

(a) Predict the physical state and colour of astatine at room temperature and pressure.

physical state .....

colour .....

[2]

(b) When chlorine reacts with aqueous potassium bromide a displacement reaction occurs.

(i) Describe the colour change of the solution.

from ..... to .....

[2]

(ii) Write a chemical equation for this reaction.

..... [2]

(c) Reactions occur when some aqueous solutions of halogens are added to aqueous solutions of halides.

Use the key to complete the table to show the results of adding halogens to halides.

key
✓ = reaction
✗ = no reaction

		halides		
		KCl(aq)	KBr(aq)	KI(aq)
halogens	Cl_2(aq)		✓	
	Br_2(aq)			
	I_2(aq)			

[2]

[Total: 8]

Group VII: the halogens Click for more variations

STEM | Exam Builder

9 For each of the following unfamiliar elements predict one physical and one chemical property.

(a) caesium (Cs)

physical property .....

chemical property .....

..... [2]

(b) vanadium (V)

physical property .....

chemical property .....

..... [2]

(c) fluorine (F)

physical property .....

chemical property .....

..... [2]

[Total: 6]

Group I: the alkali metals Click for more variations

STEM | Exam Builder

10 Dmitri Mendeleev published his first Periodic Table in 1869.
Part of this table is shown below.

			Ti = 50
			V = 51
			Cr = 52
			Mn = 55
			Fe = 56
			Co = 59
H = 1			Cu = 63.4
	Be = 9.4	Mg = 24	Zn = 65.2
	B = 11	*Al* = 27.4	?
	C = 12	Si = 28	?
	N = 14	P = 31	As = 75
	O = 16	S = 32	Se = 79.4
	F = 19	*Cl* = 35.5	Br = 80
Li = 7	Na = 23	K = 39	Rb = 85.4

(a) (i) What differences are there between Mendeleev's table and the Periodic Table we use today?

.....

.....

.....

.....

..... [4]

(ii) State the names of any **two** elements in the table above which exist as diatomic molecules.

..... and ..... [1]

(b) Titanium is a transition element. Sodium is a metal in Group I of the Periodic Table.
State **three** differences in the physical properties of titanium and sodium.

1 .....

2 .....

3 .....

[3]

STEM | Exam Builder

(c) Titanium(IV) oxide reacts with a mixture of chlorine and carbon.
The products are titanium(IV) chloride, $TiCl_4$, and a gas which turns limewater milky.
Complete the symbol equation for this reaction.

$$TiO_2 + ...Cl_2 + C \rightarrow TiCl_4 + ...$$

[2]

(d) Titanium is extracted from titanium(IV) chloride by reduction with molten sodium in the presence of argon.
Suggest why this reaction is carried out in the presence of argon.

.....

..... [2]

[Total: 12]

Arrangement of the Periodic Table and trends Click for more variations

STEM | Exam Builder