St. Ninian's High School

S1 Science
Unit 4 - Chemistry
Self-Checks
Answer Booklet

Self-Check 4.1 (Solids, Liquids and Gases)

1) Copy and complete the following statements:

Solids: have a **fixed** shape and a **fixed** volume.

Liquids: have a **fixed** volume but **no** fixed shape.

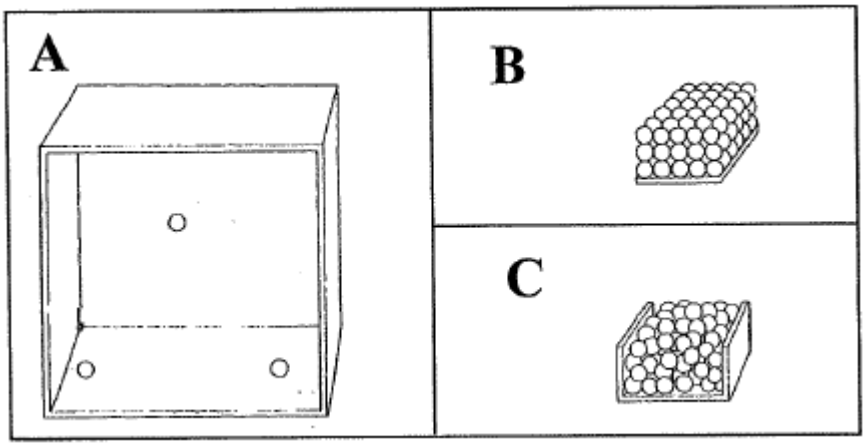
Gases: have **no** fixed shape and no fixed **volume**

2) What state of matter are the following

Substance	**Fixed Volume / No Fixed Volume**	**Fixed Shape / No Fixed Shape**	**Solid, liquid or gas**
Shower Gel	**Fixed volume**	**No fixed shape**	**Liquid**
Shaving Foam	**Fixed volume**	**No fixed shape**	**Liquid**
Toothpaste	**Fixed volume**	**No fixed shape**	**Liquid**
Hairspray	**Fixed volume**	**No fixed shape**	**Liquid**
Sand	**Fixed volume**	**Fixed shape**	**Solid**
Carbon dioxide	**No fixed volume**	**No fixed shape**	**Gas**
Helium	**No fixed volume**	**No fixed shape**	**Gas**
Soap/Hand wash	**Fixed volume**	**No fixed shape**	**Liquid**
Sugar	**Fixed Volume**	**Fixed shape**	**Solid**

Self-Check 4.2 (Arrangement of Particles)

1) Look at the drawings A, B and C below.



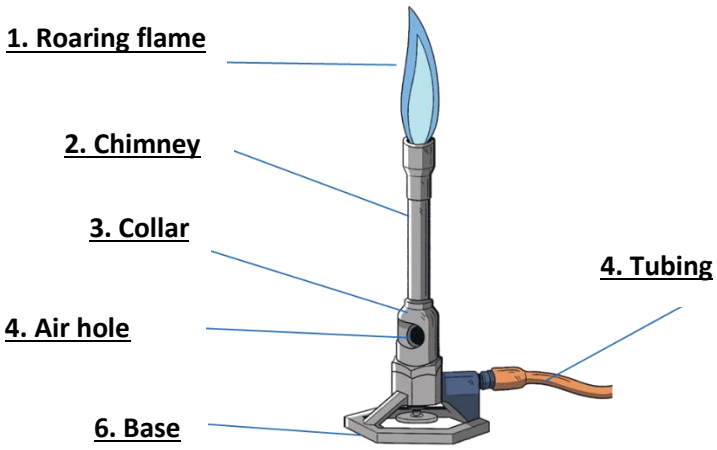
(a) Which shoes the arrangement of atoms in a solid? **B**
(b) Which shows the arrangement of atoms in a liquid? **C**
(c) Which shows the arrangement of atoms in a gas? **A**

2) Comparing Solids, Liquids and Gases

(a) Which have the biggest spaces between atoms? **Gases**
(b) Which have a regular arrangement of atoms? **Solids**

Self-Check 4.3 (Bunsen burner)

Key words
- collar
- tubing
- air hole
- roaring flame
- yellow flame
- chimney
- base



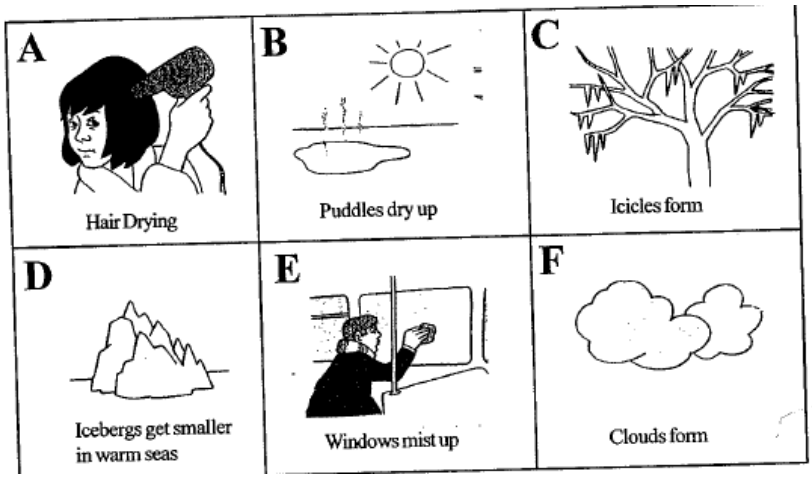
1) Complete the labelling for the parts of the Bunsen burner 1-6 in the diagram above

2) Copy and complete the table below

	Colour of the Flame	Sound of the Flame	When Is It used?	Amount of Oxygen
Air Hole Open	Blue	Roaring	To heat things quickly	Lots
Air Hole Half Open	Blue	Quite noisy	To heat things slowly	A little
Air Hole Fully Closed	Yellow	Quiet	Safety flame - when Bunsen not being used	Very little

Self-Check 4.4 (Changes of State)

1) Use the words Evaporation, Condensation, Melting and Freezing to describe what is happening in the pictures below.



A. Hair drying is evaporation

B. Puddles drying up is evaporation

C. Icicles forming is freezing

D. Icebergs getting smaller in warmer seas is melting

E. Windows misting up is condensation

F. **Clouds forming is condensation**

2) When water evaporates the molecules.

A get bigger

B get smaller

C move closer together

D move further apart

3) When water freezes the molecules

A get bigger

B get smaller

C move closer together

D move further apart

Self-Check 4.5 (The Periodic Table)

Using the data book from the trolley to help you. Answer the following.

1) What are the atomic numbers of the following elements?

(a) Silicon - **14**	(b) Chlorine - **17**	(c) Helium - **2**
(a) Neon - **10**	(e) Calcium- **20**	(f) Sulfur - **16**
(g) Lithium - **3**	(h) Magnesium - **12**	(i) Aluminium- **13**

2) Identify the elements which have the following symbols

(a) Na - **Sodium**	(b) K - **Potassium**	(c) O - **Oxygen**
(d) Pb - **Lead**	(e) I - **Iodine**	(f) Ne - **Neon**
(g) Al - **Aluminium**	(h) P - **Phosphorus**	(i) Kr - **Krypton**

3) What are the chemical symbols for the following elements?

(a) Magnesium - **Mg**	(b) Silicon - **Si**	c) Germanium **-** **Ge**
(d) Strontium - **Sr**	(e) Xenon - **Xe**	(f) Bromine - **Br**
(g) Arsenic - **As**	(h) Antimony - **Sb**	(i) Silver - **Ag**

Self-Check 4.6 (Elements, mixtures and compounds)

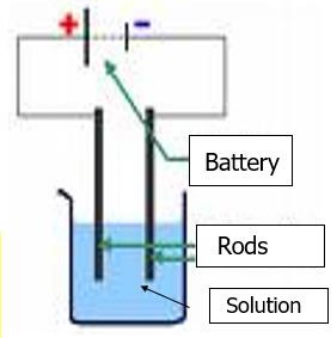
1) Look at the names of the compounds below. Name the elements which are present in each compound.

(a) **hydrogen & sulfur**
(b) **magnesium & oxygen**
(c) **potassium & chlorine**
(d) **potassium & sulfur**
(e) **sulphur & chlorine**
(f) **silicon & oxygen**
(g) **chlorine & oxygen**
(h) **magnesium & chlorine**
(i) **sodium & chlorine**
(j) **sodium & iodine**
(k) **carbon & chlorine**
(l) **magnesium & iodine**

2) Look at the names of the compounds below. Name the elements which are present in each compound.

(a) **calcium & nitrogen**
(b) **copper & chlorine**
(c) **aluminium & oxygen**
(d) **magnesium & nitrogen**
(e) **iron & sulfur**
(f) **copper & oxygen**

Self-Check 4.7 (Breaking compounds)



1) What is the name of the technique you have used to break down compounds?
   Electrolysis
2) What do you use to break the compound?
   Electricity
3) Name the elements that would be found if you were to break the following compounds?

(a) **hydrogen & sulfur**
(b) **potassium & chlorine**
(c) **sulfur & chlorine**
(d) **chlorine & oxygen**
(e) **sodium & chlorine**
(f) **carbon & chlorine**
(g) **nitrogen & iodine**
(h) **potassium & oxygen**
(i) **nitrogen & oxygen**
(j) **tin & chlorine**
(k) **magnesium & oxygen**
(l) **potassium & sulfur**
(m) **silicon & oxygen**
(n) **magnesium & chlorine**
(o) **sodium & iodine**
(p) **magnesium & iodine**
(q) **aluminium & chlorine**
(r) **potassium & iodine**
(s) **nitrogen & chlorine**
(t) **phosphorous & oxygen**

Self-Check 4.8 (Filtration and Evaporation)

1) Comparing sand and salt

   (a) Which is soluble in water? **Salt is soluble in water**

   (b) Which is insoluble in water? **Sand is insoluble in water**

   (c) Which can be removed by filtration? **Sand can be removed from water by filtration**

2) What would you do to muddy water to remove the mud?

   A melt it

   B evaporate it

   C filter it

   D dissolve it

3) What would you do to salty water to get the salt?

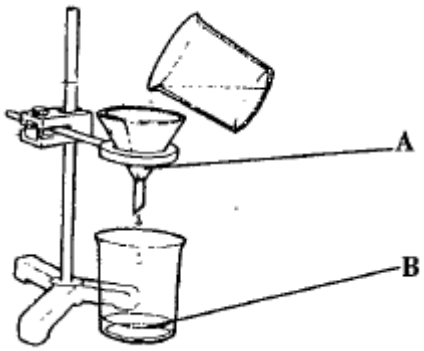
   A melt it

   B evaporate it

   C filter it

   D dissolve it

4) Look at the diagram below which shows filtration of a mixture of sand, salt and water.



(a) Using the letters A & B

i) Where is the sand after it is it filtered? **A**
ii) Where is the salt after it is it filtered? **B**
iii) Where is the water after it is it filtered? **B**

(b) Salt dissolves in water, what word describes things which dissolve in water? **Soluble**

(c) Draw a diagram of the other technique required to separate the remaining mixture

Self-Check 4.9 (The pH Scale)

1) (a) How can the pH of a solution be measured? **pH paper, universal indicator or pH meter**

(b) What colour does universal indicator turn in acid solutions? **Red/orange/yellow**

(c) What is the pH range for acids? **pH 0-6**

(d) What colour does universal indicator turn in alkaline solutions? **Blue-green/purple**

(e) What is the pH range of alkalis? **pH 8-14**

(f) What colour do neutral solutions turn universal indicator? **Green**

(g) What is the pH of neutral solutions? **pH 7**

2) A pupil measured the pH of a solution of vinegar. He found that it had a pH of 5.

(a) What does the pH tell us about the vinegar? **The vinegar is acidic/ It is an acid**

(b) What would happen to the colour of the universal indicator if it were added to the vinegar? **It would turn orange-yellow**

3) A pupil took some table salt and dissolved it in water. She found out that table salt is neutral.

(a) What pH would the solution of table salt have had? **pH 7**

(b) What would happen to the colour of the universal indicator if it were added to the salt solution? **It would turn green**