JOHN GRAY HIGH SCHOOL

KS3 SCIENCE: YEAR 8

END OF TERM 1 TEST

CHEMISTRY: PHYSICAL AND CHEMICAL CHANGES

PAPER 2

Time : 45 mins

READ THE FOLLOWING INSTRUCTIONS CAREFULLY.

1. This paper consists of **THREE** questions.

2. Answer **ALL** questions.

3. Indictate your answers in the spaces provided.

4. Remember to read the questions properly before attempting to answer

5. You are permitted to use a calculator in this exam.

Name: _____

Teacher's Name: _____

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO.

1. a. Complete the sentences on states of matter by selecting the sentences words from the drop-down boxes.

Solids:

- cannot be _____, do not _____, and have a fixed _____ and _____.
- have a high _____.
- are made of _____ that are very close together.

Liquids:

- cannot be _____ and have a fixed _____, _____ easily and do not have a fixed _____.
- are _____, but not as _____ as solids.
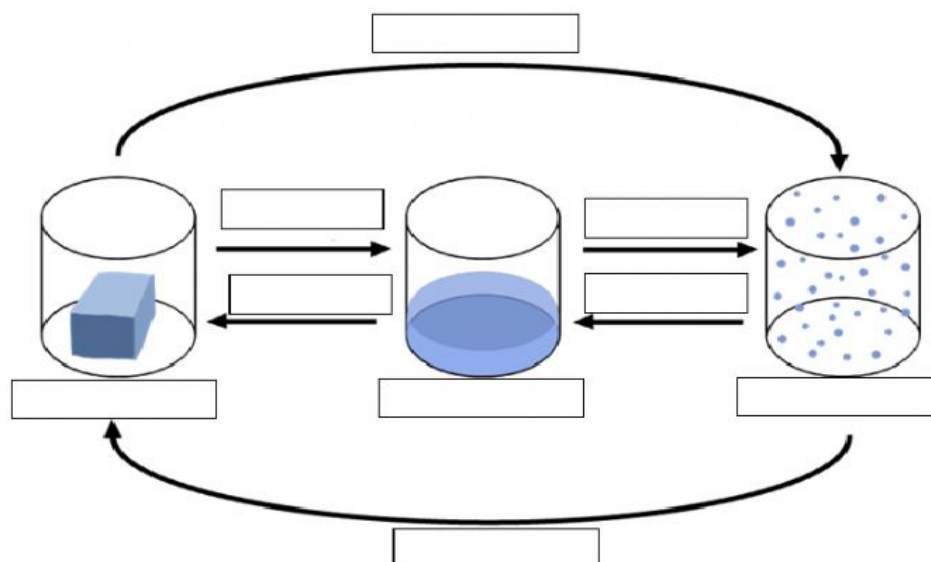- are made of _____ that are close together.

Gases:

- are easy to _____, _____ very easily, and do not have a fixed_____ or _____.
- have a lower _____ than liquids.
- are made of _____ that are far apart.

(19 marks)

b. States of matter are able to change. Complete the diagram below by dragging the correct labels.

LIQUID	deposition	condensation
evaporation	melting	SOLID
sublimation	GAS	freezing

(9 marks)

c. **Complete the sentences below about changing states.**

Matter changes from one _____ to another when it is _____ or cooled.

When matter is heated, the particles gain _____ energy and _____.

This is why when particles of a _____ are heated, they become particles in a liquid.

When heat is removed from matter, it _____. The particles lose _____ energy

and come closer together. So, particles of a liquid turn back into particles in a

_____. Heating liquids turn them to _____ and _____ gases turn

them to liquids. *(10 marks)*

d. Below is a heating curve. Use information from the diagram to answer the questions.
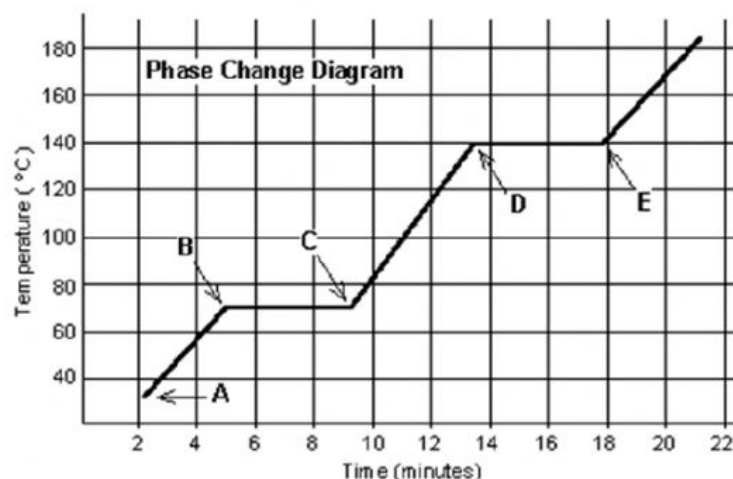
i.   From A to B, the material is in the _____ state of matter.

ii.   From B to C, the process of _____ is taking place.

iii.   From C to D, the material is in the _____ state of matter.

iv.   From D to E, the process of _____ is taking place.

v.   Anything after E is in the _____ state of matter.

vi.   The boiling point of the substance is _____°C.

(6 marks)

2. a. Drag the following word in the correct places to make the equation for calculating density. **(3 marks)**

Volume   **Mass**   **Density**

$$\boxed{} = \frac{\boxed{}}{\boxed{}}$$

b. The density of water is 1 g/cm³. Will the following objects or substances FLOAT or SINK in a basin of water, based on their density. **(5 marks)**
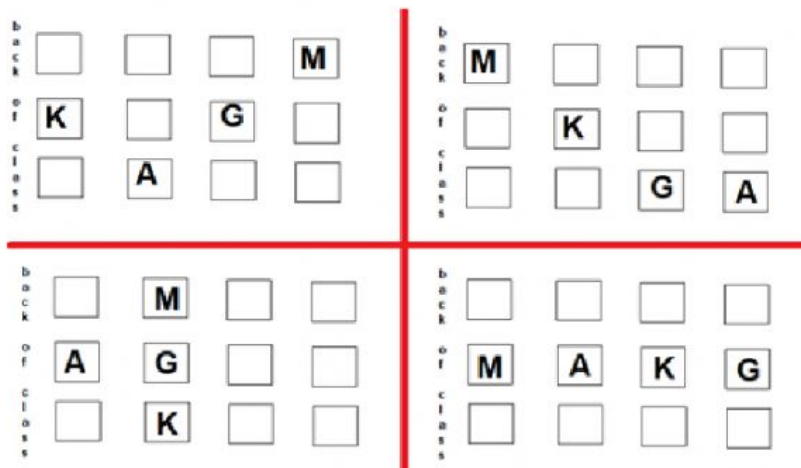
I.   Helium (0.18 g/cm³) _____

II. Chlorine gas (3.2 g/cm³) _____

III. Paper (0.4 g/cm³) _____

IV. Iron (7.9 g/cm³) _____

V.   Honey (1.4 g/cm³) _____

c. Calculate the density of the following objects.

   i. Calculate the DENSITY of a ball if its mass is 20g and its volume is 5cm³.   **(3 marks)**

$$\text{density} \;=\; \frac{\boxed{}}{\boxed{}} \;=\; \frac{\boxed{}\;\text{g}}{\text{cm}^3}$$

$$= \boxed{} \;\text{g/cm}^3$$

3. a. Maribella (M) sprayed her perfume at the back of the class. Kirkell (K) smelled it

before Alexanderova (A) who smelled it after Gagaloosh (G). Which class arrangement

shows how they were most likely sitting?

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<tr><td>

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b
a     ☐    ☐    ☐    M
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k
o     K    ☐    G    ☐
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c
k
o     M    A    K    G
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l     ☐    ☐    ☐    ☐
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b. How do the following factors affect how quickly particles will spread by diffusion?

   i.   Increasing the size of the particles being diffused. _____

   ii.   Diffusing a gas instead of a liquid. _____

   iii. Decreasing the temperature of the particles being diffused. _____

   iv.   Increasing the number of particles being diffused. _____

   v.   Decreasing the size of the container or room in which diffusion occurs. _____

(6 marks)

c. Calculate the concentration of the following solids dissolved in water using the given equation.

   i. A mass of 30g of salt was dissolved in 60cm³ of water. Calculate the concentration of the salt solution.

$$\text{concentration} = \frac{\text{mass}}{\text{volume}}$$

$$\text{concentration} = \frac{\boxed{}\text{ g}}{\boxed{}\text{ cm}^3} = \boxed{}\text{ g/cm}^3$$

d. Calculate the concentration of the following liquids dissolved in water using the given equation.

   i. A volume of 75cm³ of acid was mixed with 300cm³ of water. Calculate the percentage concentration of the acid solution.

$$\text{concentration} = \frac{\text{volume acid}}{\text{volume water}} \times 100$$

$$\text{concentration} = \frac{\boxed{}\text{ cm}^3}{\boxed{}\text{ cm}^3} \times 100 = \boxed{}\text{ \%}$$

(6 marks)

4. a. Complete the table below about the features of physical and chemical changes in science. *(4 marks)*

PHYSICAL CHANGES	CHEMICAL CHANGES

b. Are the following examples of physical or chemical changes? *(8 marks)*

i. Melting butter then allowing to harden again. _____

ii. Iron rusting when exposed to oxygen. _____

iii. Water freezing to form ice. _____

iv. Breaking a mirror. _____

v. Frying fish. _____

vi. Wetting a sheet of newspaper with water. _____

vii. Making cheese from milk. _____

viii. Mixing salt and water. _____

c. Complete the passage about acids and bases.

Acids release _____ in water. They taste _____ and turn _____

litmus paper _____. Bases are _____ to the touch and turn _____

litmus paper _____. Pure water is said to be _____. *(4 marks)*

d. Answer the questions based on the pH scale shown below. **(4 marks)**

14	Liquid drain cleaner, Caustic soda
13	bleaches, oven cleaner
12	Soapy water
11	Household Ammonia (11.9)
10	Milk of magnesium (10.5)
9	Toothpaste (9.9)
8	Baking soda (8.4), Seawater, Eggs
7	"Pure" water (7)
6	Urine (6) Milk (6.6)
5	Acid rain (5.6) Black coffee (5)
4	Tomato juice (4.1)
3	Grapefruit & Orange juice, Soft drink
2	Lemon juice (2.3) Vinegar (2.9)
1	Hydrochloric acid secreted from the stomach lining (1)
0	Battery Acid

1. What range of pH are basic?

   pH_____ to pH_____

2. What range of pH are acidic?

   pH_____ to pH_____

3. What is neutral pH? pH_____

4. What is the pH of the following substances?

   i.   Soapy water is pH _____

   ii. Black coffee is pH _____

   iii. Battery acid is pH _____

   iv. Pure water is pH _____

   v.   Caustic soda is pH _____

e. When acids and bases react completely with one another to form a salt and water this process is called _____.   **(1 mark)**

f. What salt is formed when the following acids and bases react completely? Drag to correct answers into place

Calcium	Nitric	Sulphate	Sodium	Iron
Sulphuric	Chloride	Titanium	Magnesium	Nitrate

   i.   Sodium hydroxide + Hydrochloric acid → _____ _____ + water

   ii. Calcium hydroxide + Nitric acid → _____ _____ + water

   iii. Magnesium hydroxide + Sulphuric acid → _____ _____ + water

   iv. _____ hydroxide + _____ acid→ Iron nitrate + water

   v.   _____ acid + _____ oxide → Titanium sulphate + water

   (5 marks)

LIVEWORKSHEETS