



**Western Cape  
Government**  
Education

Directorate: Curriculum GET



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**GET Term 2 Take Home Package**

**Natural Sciences**

**Grade 8**



### CONSOLIDATION ACTIVITY: Grade 8 Atoms

#### QUESTION 1: MULTIPLE-CHOICE QUESTIONS



Four options are provided as possible answers to the following questions. Each question has only ONE correct answer. Write only the letter (A–D) next to the question number (1.1–1.4

- 1.1 All matter is made up of tiny particles called
    - A. Protons
    - B. Electrons
    - C. Atoms
    - D. Elements

(2)
  
  - 1.2 The following element is found as a diatomic molecule in nature
    - A. Sodium
    - B. Chlorine
    - C. Aluminium
    - D. Helium

(2)
  
  - 1.3 Which one of the following particles are the biggest?
    - A. Electron
    - B. Proton
    - C. Neutron
    - D. Atom

(2)
  
  - 1.4 The following particle is NOT found inside an atom:
    - A. Proton
    - B. Electron
    - C. Neutron
    - D. molecule

(2)
- (8)**

#### QUESTION 2

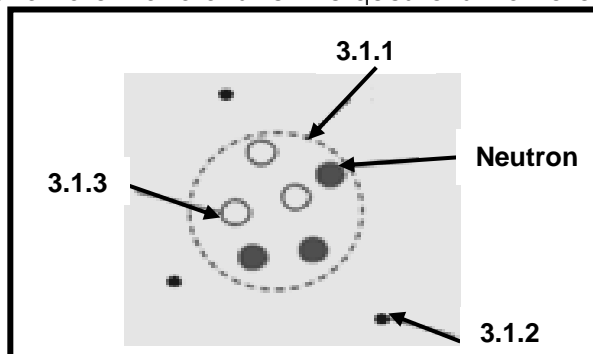
Choose a description from column B that best fits the term provided in column A. Write down the number of the term in column A followed by the letter of the description in column B eg 1.6 A

	Column A		Column B
2.1	Nucleus	A.	Negatively charged particles
2.2	Electrons	B.	Particles that are not charged
2.3	Elements	C.	Region where protons and neutrons are found.
2.4	Mixture	D.	Made up of atoms that are all of the same kind
2.5	Compound	E.	Sea water
		F.	Table salt
		G.	Region where protons and electrons are found

(5)

### QUESTION 3

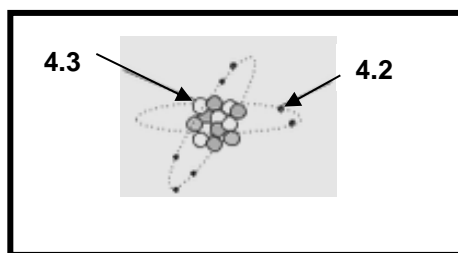
Study the diagram below of an atom and answer the questions that follows:



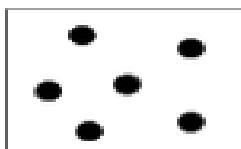
- 3.1 Provide the correct labels for 3.1.1 - 3.1.3 as follows:
- 3.1.1 A specific region in the atom where neutrons and particles 3.1.3 is found. (1)
- 3.1.2 A particle that is very small and found outside the region mentioned in QUESTION 3.1.1 (1)
- 3.1.3 A particle that is found inside the region mentioned in QUESTION 3.1.1 and that is NOT the neutron. (1)
- 3.1.4 What is the charge on the particle identified in QUESTION 3.1.3? (1)
- 3.2 Give the charge for particle 3.1.2 (1)
- 3.3 Explain why this atom is neutral. (2)
- (7)**

### QUESTION 4

Study the picture below showing a representation of an atom of nitrogen, and answer the Questions that follows.



- 4.1 Explain the difference between an atom and an element. (2)
- 4.2 What are the particles called that is labelled 4.2 in the sketch? (1)
- 4.3 What is the region 4.3, where two kinds of particles are found, called? (1)
- 4.4 Give the names of the two types of particles that are found in region 4.3 (2)
- 4.5 Peter is asked to make a drawing of the particles that make up nitrogen gas. Each nitrogen atom in his sketch is represented by a black dot as shown below.



- 4.5.1 Is this an accurate representation for the arrangements of nitrogen atoms in nitrogen gas? (1)
- 4.5.2 Explain your answer. (1)
- 4.6 Explain the difference between a compound and a mixture. (2)
- (10)**
- TOTAL (30)**

### SOLUTIONS TO ACTIVITIES

#### Question 1: MULTIPLE-CHOICE QUESTIONS

1.1	C ✓✓	1.2	B ✓✓	1.3	D ✓✓	1.4	D ✓✓
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**(8)**

#### Question 2:

2.1	C ✓	2.2	A ✓	2.3	D ✓	2.4	E ✓✓	2.5	F ✓
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**(5)**

#### Question 3:

- 3.1.1 Nucleus ✓ (1)
- 3.1.2 Electron ✓ (1)
- 3.1.3 Proton ✓ (1)
- 3.1.4 Positive ✓ (1)
- 3.2 Negative ✓ (1)
- 3.3 There are an equal amount of protons and electrons in the atom ✓✓ (2)
- (7)**

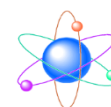
#### Question 4:

- 4.1 An atom consist of a nucleus with protons and neutrons that is surrounded by electrons. ✓ (1)
- An element is a collection of identical atoms. ✓ (2)
- 4.2 Electrons ✓ (1)
- 4.3 Nucleus ✓ (1)
- 4.4 Protons✓ and neutrons✓ (2)
- 4.5 4.5.1 No✓ (1)
- 4.5.2 Nitrogen consist of diatomic molecules ✓ (1)
- 4.6 A compound form when different atoms combine chemically ✓ (1)
- A mixture can consist of different elements and/or compounds that do not combine chemically. ✓ (2)
- (10)**
- TOTAL: (30)**

### Consolidation Grade 8 Density

#### Activity 1

#### Question 1: Multiple choice questions



Various options are provided as answers to the following questions. Choose the correct answer and write down only the letter next to the question number.

- 1.1 What do we call the scientific theory used to explain that all matter is made up of particles?
- A. The model of matter

- B. The particle model of matter  
 C. The particle model of solids  
 D. The theory of particles (2)
- 1.2 What do we call the movement of (liquid or gas) particles from an area of high concentration to an area of low concentration?  
 A. Diffusion  
 B. Mixing  
 C. Flowing  
 D. Movement (2)
- 1.3 What do we call the quantity of the matter in a substance?  
 A. Volume  
 B. Amount  
 C. Mass  
 D. Weight (2)
- 1.4 On cooling, gas particles lose kinetic energy. What phase change will occur as a result of this?  
 A. Evaporation  
 B. Boiling  
 C. Melting  
 D. Condensation (2)
- 1.5 Which of the following is not a characteristic of a solid?  
 A. The bonds between the particles are weak  
 B. They have a fixed volume.  
 C. The particles only vibrate.  
 D. The particles are tightly packed together. (2)
- 1.6 A phase change in science is the shifting of an element form from one form to another due to the addition of...  
 A. The bonds between the particles are weak  
 B. They have a fixed volume.  
 C. The particles only vibrate.  
 D. The particles are tightly packed together. (2)
- 1.7 Collisions of gas particles with each other and against the sides of the container results in...  
 A. Expansion  
 B. Pressure  
 C. Contraction  
 D. None of the above (2)
- 1.8 What happens to the particles of a material when it expands?  
 A. The particles move close to each other  
 B. The particles move further apart  
 C. The particles get bigger  
 D. The particles gain mass (2)
- 1.9 What does the density of a material depend on?  
 A. The kind of particles it is made up of  
 B. The size of the spaces between the particles

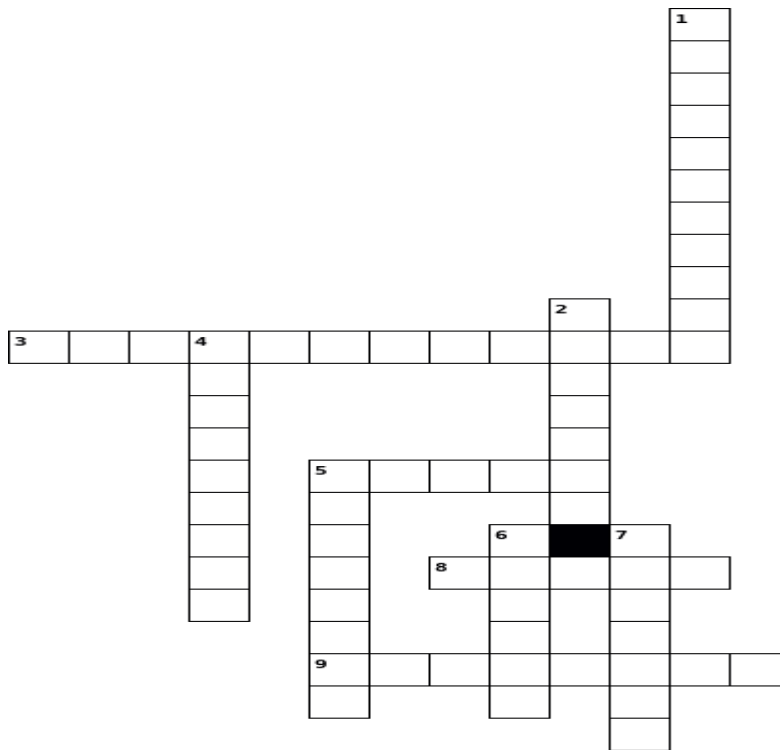
- C. How much mass the particles have
- D. A and B (2)

- 1.10 The phase change directly from a solid to a gas is called...
- A. Melting
  - B. Boiling
  - C. Sublimation
  - D. Evaporation (2)
- (10x2) **(20)**

**Question 2: Crossword puzzle**

Complete the following crossword puzzle or complete it online by clicking on the link at the bottom of the page.

**Particle model of matter**



**Clues: Across**

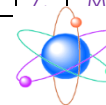
- 3. When a gas turns into a liquid
- 5. Matter where particles are closely packed and cannot move from position
- 8. Matter where particles are far apart and can move freely
- 9. When liquid turns into solid

**Down**

- 1. When liquid turns into gas
- 2. Particles are close together , but can move around
- 4. Movement of particles from higher concentration to lower concentration
- 5. When a liquid turns into a solid
- 6. Anything that has mass and takes up space
- 7. When solid turns into liquid

Suggested Solutions: Question 1									
1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	1.10
B	A	C	D	A	C	B	B	D	C

Suggested Solutions: Question 2												
Across	3.	Condensation	5.	Solid	8.	Gases	9.	Freezing				
Down	1.	Evaporation	2.	Liquids	4.	Diffusion	5.	Solidify	6.	Matter	7.	Melting



**Consolidation Activity Grade 8 Density**

**QUESTION 1 - Multiple Choice**

Various options are provided as answers to the following questions. Choose the correct answer and write down only the letter next to the question number.

- 1.1 The density of an object is ...
  - A. The mass divided by the volume  $D = m/V$
  - B. The volume divided by the mass  $D = V/m$
  - C. The same as its weight
  - D. The same as the size of the object (2)
  
- 1.2 If two objects have the same volume but one has a greater mass, the one with greater mass
  - A. Has a lower density
  - B. Has a higher density
  - C. Will float
  - D. Will sink (2)
  
- 1.3 If two objects have the same volume but one is made up of smaller and heavier atoms, the one with small heavy atoms will
  - A. Be larger than the other
  - B. Be less dense than the other
  - C. Be more dense than the other
  - D. Float (2)
  
- 1.4 If you cut a wooden block in half, each half would have
  - A. Half the density of the original piece
  - B. Twice the density of the original piece
  - C. The same density as the original piece
  - D. No density at all (2)
  
- 1.5 If two objects have the same mass but different volumes
  - A. The one with the larger volume has the lower density
  - B. They must have the same density
  - C. The one with the larger volume has the higher density
  - D. The one with the larger volume is twice as dense (2)
  
- 1.6 If the density of water is 1 gram/cm<sup>3</sup>, this means that the mass of 100 cm<sup>3</sup> of water should be

- A. 100 grams
  - B. 50 grams
  - C. 1000 grams
  - D. 1 gram (2)
- 1.7 100 millilitres of water have a mass of 100 grams. If you measured the mass of 50 millilitres of water, the mass would be
- A. 25 grams
  - B. 200 grams
  - C. 100 grams
  - D. 50 grams (2)
- 1.8 An object should float in a liquid if it is
- A. More dense than the liquid
  - B. Less dense than the liquid
  - C. Lighter than metal
  - D. Shaped like a ball (2)
- 1.9 A tiny piece of sand is very light but sinks in water. This is because
- A. Sand is a solid
  - B. Sand is less dense than water
  - C. There is more water than sand
  - D. Sand is more dense than water (2)
- 1.10 Wood floats in water. If you measured the mass of the same volume of wood and water
- A. The water would have a greater mass
  - B. The water would have a lower mass
  - C. The mass of the wood and water would be the same
  - D. The mass of the wood and water would both be 100 grams (2)
- 1.11 A candle floats in water but sinks in alcohol. This is because
- A. The candle has less mass in alcohol
  - B. The water has less mass than the alcohol
  - C. The water is more dense than the alcohol
  - D. Water and alcohol are both liquids (2)
- 1.12 Alcohol is less dense than water. If you measured the mass of the same volume of alcohol and water
- A. The water would have a greater mass
  - B. The water would have a lower mass
  - C. The mass of the alcohol and water would be the same
  - D. The mass of the alcohol and water would cancel each other out (2)
- 1.13 A carrot floats in salt water but sinks in fresh water. This is because
- A. Salt water is more dense than fresh water
  - B. Fresh water is more dense than salt water
  - C. The carrot is more dense than salt water



- D. A larger piece of carrot has a different density (2)
- 1.14 The density of hot water
- A. Is greater than the density of cold water
- B. Is less than the density of cold water
- C. The same as the density of cold water
- D. Depends on the volume of water (2)
- 1.15 The density of hot and cold water is different mainly because
- A. The molecules in hot water move slower and are slightly closer together
- B. The molecules in hot water are larger
- C. The molecules in hot water move faster and are slightly further apart
- D. The molecules in cold water move faster and are further apart (2)

**(2x15) (30)**

### **QUESTION 2**

Below is a table with some different substances and their densities. Use this information to do the following calculations. When you are asked to perform calculations, show how you worked out each answer and do not forget to include the units in your answer.

<b>Material</b>	<b>Density (g/ml)</b>
Water (liquid)	1.0
Ice	0.917
Glass	2.6
Salt	2.2
Chalk	2.36
Coal	1.5
Cork	0.25

- 2.1 Arrange the materials from least dense to most dense. (2)
- 2.2 You have a piece of coal and a piece of cork which are the same size. They have the same volume of 100 ml. Which one will have the greater mass? (2)
- 2.3 Calculate the exact mass of each piece of coal and cork mentioned in question 2.2. (6)
- 2.4 You have a 500 g block of ice at home. What is the volume of the block of ice? (3)
- 2.5 When salt is added to a glass of water it sinks to the bottom of the glass. Explain, using the information in the table, why salt sinks to the bottom of the glass. (2)
- (15)**

### **QUESTION 3**

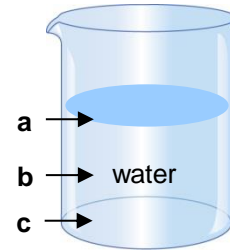
Some materials have a low density and while others have a high density. The density of a material determines if one material **floats** on top of another material or sinks to the bottom of the other material when mixed together.

- 3.1 Complete the following statements about the density of materials:
- 3.1.1 If the density of an object is higher than that of a liquid, it will \_\_\_\_\_ in the liquid. (1)

3.1.2 If the density of an object is lower than that of a liquid, it will \_\_\_\_\_ in the liquid. (1)

3.2 The density of water is **1.0 g/cm<sup>3</sup>**. Based on the data below, predict the position of the objects in the beaker of water. Write only **a, b or c**.

Object	Density (g/cm <sup>3</sup> )	Position	
Plasticine	1.4	3.2.1	
Gold	19.3	3.2.2	
Oil	0.9	3.2.3	



(3)  
(5)

#### QUESTION 4

Determine (by means of calculations) which of the objects listed in the table below have the greatest density.

Object	Mass of Object (grams)	Volume of Object (cm <sup>3</sup> )
W	11.0	24
X	11.0	12
Y	5.5	4
Z	5.5	11

(10)

TOTAL MARKS: (60)

#### SUGGESTED SOLUTIONS

##### QUESTION 1

1.1	A	1.2	B	1.3	C	1.4	C	1.5	A
1.6	A	1.7	D	1.8	B	1.9	D	1.10	A
1.11	C	1.12	A	1.13	A	1.14	B	1.15	C
								(2x15)	(30)

##### QUESTION 2

2.1 cork, ice, water, coal, salt, chalk, glass (2)

2.2 coal (2)

2.3	$D_{coal} = \frac{m}{v}$ $1,5 = \frac{m}{100}$ $m = 1,5 \times 100$ $m = 150 \text{ g}$ $D_{cork} = \frac{m}{v}$ $0,25 = \frac{m}{100}$ $m = 0,25 \times 100$ $m = 25 \text{ g}$ <p>Coal have the greater mass</p>	2.4	$D_{ice} = \frac{m}{v}$ $0,917 = \frac{500}{v}$ $v = \frac{500}{0,917}$ $v = 545,26 \text{ ml}$	(3)
	(6)			

- 2.5 Salt sinks to the bottom of the glass of water because salt has a greater density than water. The density of salt is 2,2 g/ml and the density of water is 1,0 g/ml (2)  
**(15)**

**QUESTION 3**

- 3.1.1 Sink (1)  
 3.1.2 Float (1)

<b>3.2.1</b>		<b>3.2.2</b>		<b>3.2.3</b>		
<b>b</b>		<b>c</b>		<b>a</b>		

(3)

**QUESTION 4**

$$D_w = \frac{m}{v}$$

$$= \frac{11}{24}$$

$$= 0,4 \text{ g/cm}^3$$

$$D_x = 0,9 \text{ g/cm}^3$$

$$D_y = 1,4 \text{ g/cm}^3$$

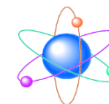
$$D_z = 0,5 \text{ g/cm}^3$$

$D_y$  has the greatest density.

(10)

**TOTAL MARKS: (60)**

**Consolidation Activity Grade 8: Expansion and Contraction of Materials and Pressure (in gases)**



**Activity 1: Expansion and Contraction of Materials**

Match the definitions in Column B with the terms in Column A and write the letter of the correct answer in the space provided.

	Column A		Column B
1.1	Contraction	A.	When a substance becomes smaller and shrinks.
1.2	Matter	B.	A substance that is made up of one type of particle only.
1.3	Expansion	C.	When a substance swells up and become larger.
		D.	Anything that takes up space and occupies volume.

(3)

**Activity 2**

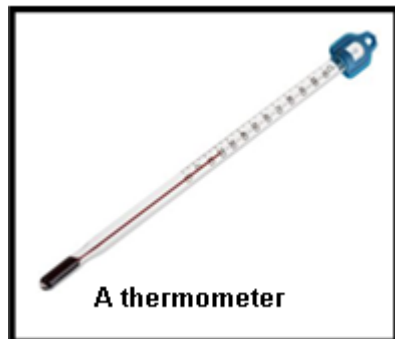
Fill in the missing words

2.1 As a material is heated, the movement of the particles \_\_\_\_\_ and they move further apart. This means that the material \_\_\_\_\_. (2)

2.2 As a material is cooled, the movement of the particles \_\_\_\_\_ and they move closer together. This means that the material \_\_\_\_\_. (2)

### Activity 3

Study the diagram of a thermometer below and answer the Questions that follow.



Imagine watching a thermometer as its temperature changes.

- 3.1 Where does the nurse/doctor place the thermometer to measure your temperature? (1)
- 3.2 Why is it placed there? (1)
- 3.3 Does the value of your temperature reading change after a while? (1)
- NOTE: The thermometer liquid moves up the glass tubing, it takes up more space. In other words, the liquid expands as it warms and therefore the value on the thermometer increases.**
- 3.4 What do you think happens to the temperature reading a few minutes after the nurse/doctor has removed a thermometer? (1)
- 3.5 Explain why did this change occur based on your answer in Question 3.4? (2)

### Activity 4: Pressure (in gases)

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Four options are provided as possible answers to the following questions. Each question only has ONE correct answer. Write only the letter (A-D) next to each question number.

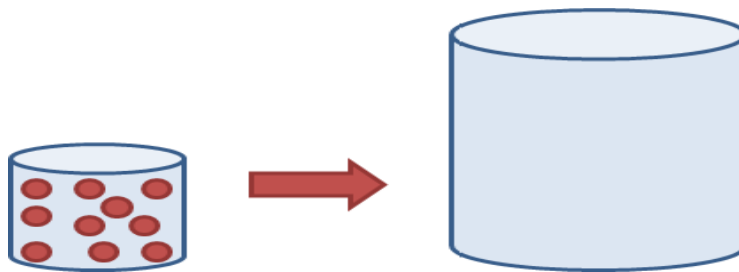
- 4.1 Pressure inside gases is explained as ...
- A. the movement of gas particles.
  - B. the bumping of gas particles against each other.
  - C. the force of the particles bumping against the sides of the container.
  - D. None of the above. (2)
- 4.2 When you add more gas particles to a container, the ...
- A. gas pressure will increase.
  - B. particles will jump out the other end of the container.
  - C. particles will stop moving.
  - D. gas pressure will decrease. (2)

**Underline the correct answer in each of the statements provided below.**

- 4.3 When you blow air into a paper bag, the paper bag **stays the same / expands** (1)
- 4.4 When a paper bag is filled, and you continue to blow into it, the bag will **collapse/stay the same/explode**. (1)
- 4.5 If you prick a hole in the paper bag and you blow into it now, the bag will **collapse/stay the same/expands**. (1)

**Activity 5:**

Study the diagram below illustrating gas pressure and answer the Questions that follow.



**An illustration of gas pressure**

- 5.1
- 5.1.1 How many particles are there in the smaller container? \_\_\_\_\_ (1)  
*Copy the same number of particles in the big container, making sure to space the particles equally from one another.*
  - 5.1.2 In which container is it easier for the gas particles to bump into each other? (1)  
*Now, add 5 more particles to each container, making sure to keep the spaces as equal as possible.*
  - 5.1.3 What do you notice about the particles in each container after you added the additional gas particles? (1)
  - 5.1.4 Is it easier for the particles to bump against one another **now**, or **before** you added the additional 5 gas particles? Why do you think so? (2)
  - 5.1.5 Are there more or less collisions – the particles bumping into each other and the sides of the container as well? (1)
  - 5.1.6 Explain your answer in Question 5.1.5 (2)
  - 5.1.7 What do you think has happened to the gas pressure after the number of particles increased **AND** after the number of collisions changed as well? (2)

**SOLUTIONS TO ACTIVITIES**

**Activity 1: Expansion and Contraction of Materials**

- 1.1 A ✓
- 1.2 D ✓
- 1.3 C ✓

**Activity 2**

- 2.1 Increases ; expands ✓✓
- 2.2 Slows down; contracts/shrinks ✓✓

**Activity 3**

- 3.1 Under the tongue/in your armpit ✓
- 3.2 because it is a warmer area of the body ✓
- 3.3 Yes it does – it increases ✓
- 3.4 The temperature reading will drop again ✓
- 3.5 The liquid inside the thermometer cooled down and the liquid contracted – that is why the liquid drops in the thermometer ✓✓

#### Activity 4: Pressure (in gases)

- 4.1 C
- 4.2 A
- 4.3 expands
- 4.4 explode
- 4.5 Stay the same



✓  
✓

#### Activity 5:

- 5.1
- 5.1.1 10 ✓
- 5.1.2 Smaller container ✓
- 5.1.3 The particles are much closer to each other/the spaces between particles are smaller ✓
- 5.1.4 It is easier now, the particles are closer together/there are more particles in the container ✓✓
- 5.1.5 There are more collisions ✓
- 5.1.6 The particles are always moving, and they bump into each other more, i.e. more collisions are taking place ✓✓
- 5.1.7 The gas pressure has increased because the number of collisions has increased ✓✓

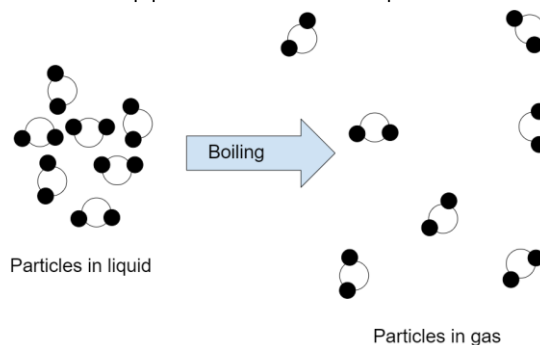
#### Consolidation Activity Grade 8 Chemical Reactions

Study the two experiments below and answer the questions that follows:

##### Experiment 1.

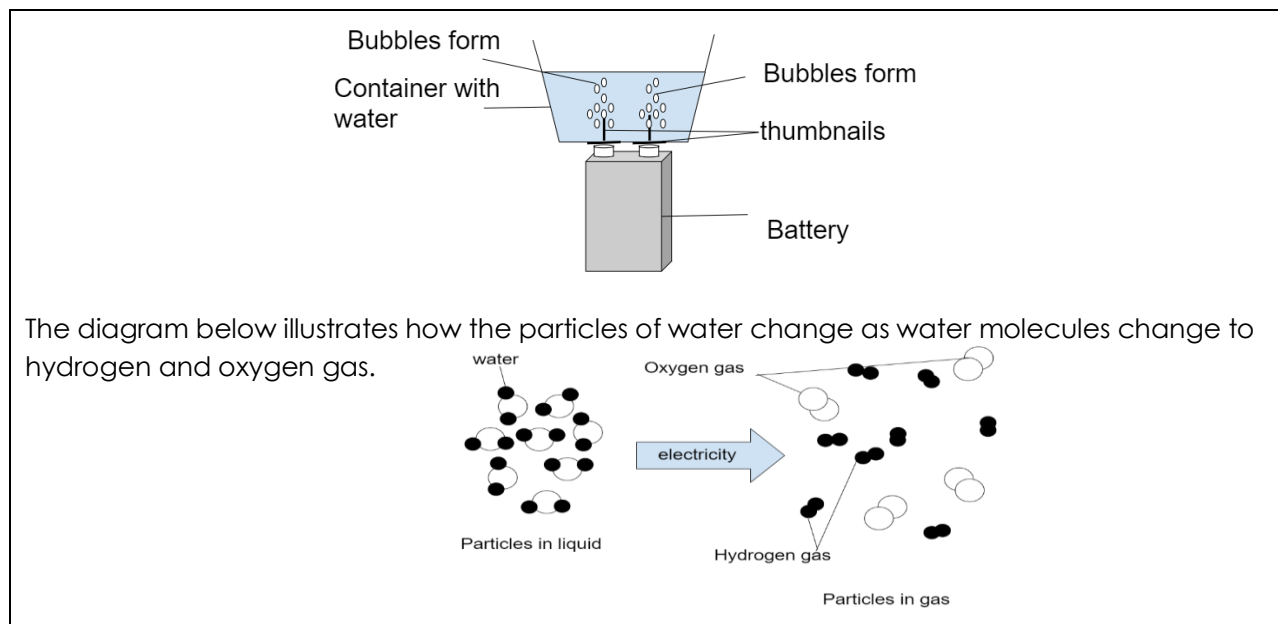
Water is heated. It starts to boil. After a while vapour is seen above the water. The volume of the water inside the container decreases.

The diagram below illustrates what happens to the water particles during this experiment.



##### Experiment 2

Take a small plastic container. At the bottom insert two thumb nails at the bottom. Fill the container with tap water and place on top of a torch cell as illustrated



### Questions

1. Refer to the arrangement of particles and explain why experiment 1 is not a chemical reaction, while experiment 2 is an example of a chemical reaction.
2. What change did you observe during experiment 1?
3. How did the water molecules change during experiment 1?
4. Look at the change of particles in experiment 2 and explain what bubbles formed at the tip of the two thumbnails.
5. If the clear circles represent oxygen atoms and the black circles represent hydrogen atoms, explain which bonds were broken in experiment 2.
6. If the clear circles represent oxygen atoms and the black circles represent hydrogen atoms, which bonds formed in experiment 2?
7. Identify the reagent for the reaction in experiment 2
8. Identify the product for the reaction in experiment 2
9. Write down a word equation for the chemical reaction in experiment 2.
10. In experiment 2 a liquid change into a gas. Do you think this is an example of change of phase of a substance? Give a reason for your answer.

### MEMORANDUM

1. In experiment 1 the arrangement of particles did not change. Before the reaction one oxygen atom was bonded to two hydrogen atoms. After the reaction one oxygen atom was still bonded to two hydrogen atoms. During experiment 2 the arrangement of atoms did change. The compound water changed and formed two elements, namely hydrogen and oxygen.
2. The liquid became hot. Bubbles formed in the water and vapour formed above the liquid. The volume of the meeting decreased as well.
3. The water molecules moved further apart and faster.
4. The bubbles at the end of the thumb nails are hydrogen and oxygen gas.
5. The bonds between hydrogen and oxygen atoms were broken.
6. New bonds between hydrogen atoms and between oxygen atoms formed.
7. Water.
8. Hydrogen and oxygen.
9.  $\text{water} \rightarrow \text{hydrogen} + \text{oxygen}$
10. No. The substance did not only change state while it otherwise was unchanged. Two new substances formed. The new substances were in a different phase than the reagent.