



Date: _____

REMBRANDT PARK SCHOOL
NATURAL SCIENCES & TECHNOLOGY GRADE 6 TERM 2
MATTER AND MATERIALS (PROCESSING)

Matter and Particles

Scientists use the word “**matter**” to refer to everything around us. Matter makes up all the materials that exist on Earth. Solids, liquids and gases are the three main states of matter. Matter is made of particles. A **particle** refers to the smallest part of a substance. The way the particles are arranged makes the matter a solid, liquid or gas. It is also possible to mix different types of particles together in their different states. For example, you have all three states in your body. Your skeleton is made up of bones, which is a solid. Blood is composed of water, which is a liquid. The oxygen you inhale and carbon dioxide you exhale are both gases.

Arrangement of particles: Solids, Liquids and Gases

Particles move. Particles move all the time. Sometimes they move slowly, sometimes they move fast. The speed and distance they move in determines if the material or substance is a solid, a liquid or a gas. The particles in solids, liquids and gases are all arranged differently. The states (solids, liquid and gases) has unique properties, such as:

- Solids keep their shape.
- Liquids flow and take the shape of their container. They fill up a container from the bottom up to a certain level. They take up a fixed amount of space in the container.
- Gases also flow and take the shape of their container. They always fill up the whole space of the container and will escape if the container is open.

The particles in a solid

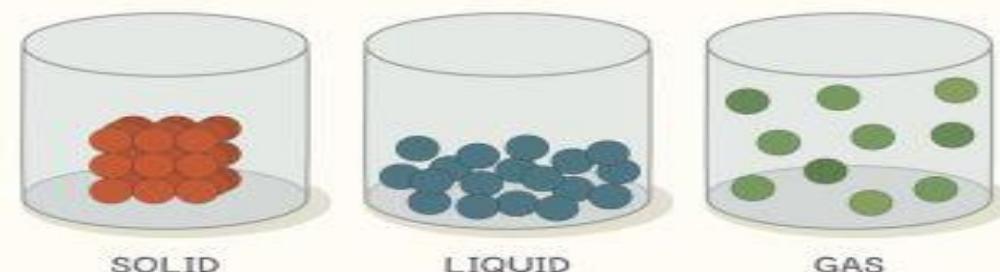
Particles in a solid are **packed tightly together** in a regular pattern, this explains why solids **cannot be compressed** (squeezed into a smaller shape). The Particles in solids also have **fixed positions**, meaning they cannot move from their positions, this explains why solids **keep their shape**.

The particles in a liquid

The Particles in a liquid are **closely packed**, like solids, liquids **cannot be compressed** either. Particles in a liquid do not have fixed positions, they are always moving around. This explains why **liquids flow**, to take the shape of their container.

The particles in a gas

In gases, the particles are very **far apart** from each other. There are big spaces between the particles. The particles in gases **move freely** in all directions and **move very fast**. This explains why gases, such as air, **has no shape**.





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NATURAL SCIENCES & TECHNOLOGY GRADE 6 TERM 2

MATTER AND MATERIALS (PROCESSING)

15

Activity 1: The 3 states of matter in everyday life

Instructions:

1. Say what material is usually kept in each container. Write your answers in the middle column.
2. Say whether the material is a solid, a liquid or a gas. Write your answers in the column on the right.

	Container	What material is inside?	Is this material a solid, liquid or gas?
1.	Balloons		
2.	Kettle		
3.	Ice Tray		
4.	Glass of milk		
5.	Bottle of cooking oil		
6.	Table/Desktop		
7.	Book		
8.	Tennis ball		
9.	Juice		
10.	Marble		
11.	Cup of tea		
12.	Fire Extinguisher		
13.	Glass Jar		
14.	Broom stick		
15.	Plastic bag (empty)		



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NATURAL SCIENCES & TECHNOLOGY GRADE 6 TERM 2

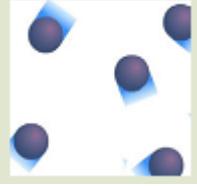
MATTER AND MATERIALS (PROCESSING)

15

Activity 2: Identify states of matter

Instructions

1. Look at how the particles are arranged in each picture and say which state of matter it represents. Write your answer in the middle column.
2. For each state of matter, choose 2 examples and write them in the column on the right.

Pictures of particles	State of matter	Examples of materials
	_____	_____ _____
	_____	_____ _____
	_____	_____ _____

3. Write two sentences about how the particles are arranged in the three states of matter.

(a) _____

(b) _____

(c) _____



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NATURAL SCIENCES & TECHNOLOGY GRADE 6 TERM 2

MATTER AND MATERIALS (PROCESSING)

17

Activity 3 – Science language activity

Instructions

1. Use the words in the box to complete the sentences.
2. You may need to use some words more than once.

<i>solids</i>	<i>liquids</i>	<i>gases</i>	<i>particles</i>	<i>big</i>	<i>small</i>	<i>regular</i>
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- (a) Matter is made up of tiny _____ that are moving.
- (b) In _____, the particles are packed close together in a _____ pattern and cannot move freely. They have _____ spaces between them.
- (c) In _____, the particles have _____ spaces between them, but can move around each other.
- (d) In _____, the particles have _____ spaces between them and can move in all directions.

[8]

3. Complete the following table.

	Solid	Liquid	Gas
How do the particles move? (6 marks)	_____	_____	_____
Draw the arrangement of particles (3 marks)			

[9]



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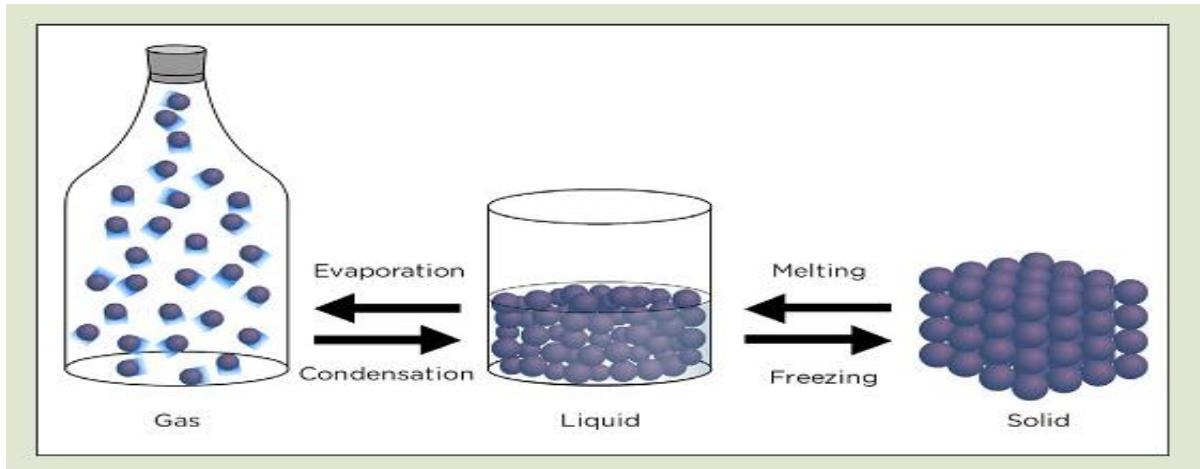
NATURAL SCIENCES & TECHNOLOGY GRADE 6 TERM 2

MATTER AND MATERIALS (PROCESSING)

11

Activity 4 – State of water

Study the picture below and answer the questions that follow.



(a) What do we call the solid state of water?

(b) What do we call the liquid state of water?

(c) What do we call the gas state of water?

(d) What do we call the process of ice changing to liquid water?

(e) What do we call the process of liquid water changing to ice?

(f) What do we call the process of liquid water changing to water vapour (steam)?

(g) What do we call the process when steam (water vapour) changes to water?

(h) Do the particles in the ice change when the ice melts?

(i) How can we change water to steam?

(j) If ice and liquid water have the same particles, why do ice and liquid water have different properties? (Ice is solid and water is liquid.)
