

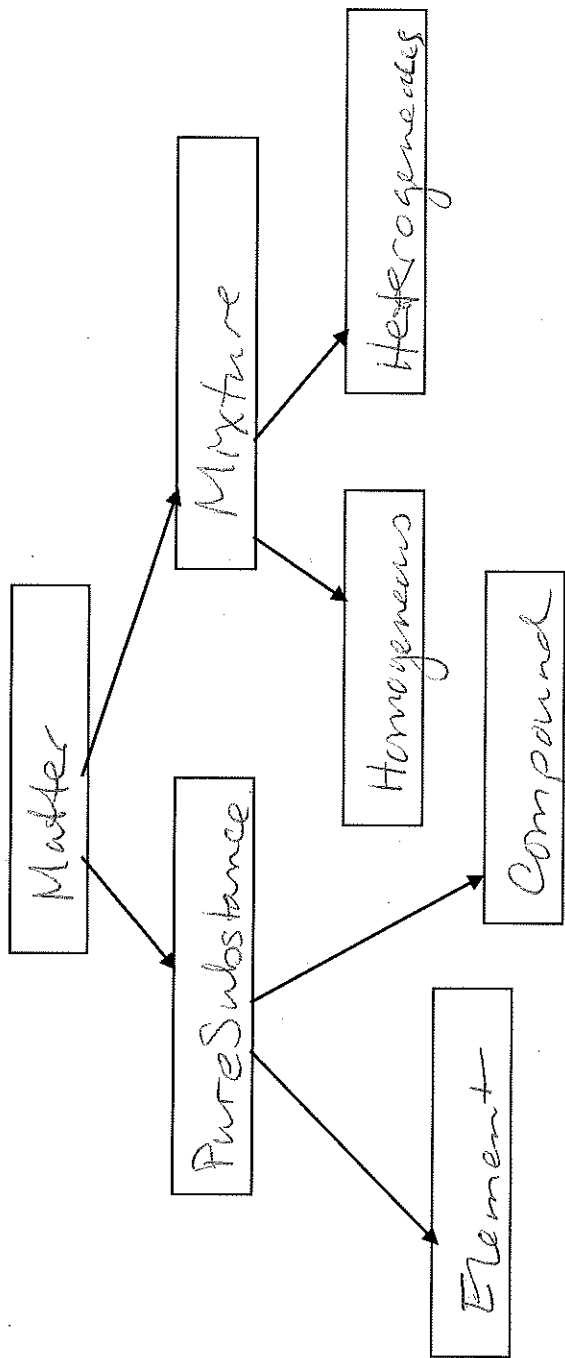
## KEY - Science 9 – Chapter 5 Review Worksheet (prepare for the test!)

### Chapter 5.1 - Classification of matter (page 152 to 155)

#### 1. Concept summary chart

Concept	Definition	Diagram (show how the concept is represented with atoms and molecules – KMT)	Examples
pure substances	<i>A substance that is made of only one type of particle.</i>		Water Oxygen
- Element	<i>A substance that has only one type of particle, and all particles are made of only one type of atom.</i>		Gold Silver (all substances named on the periodic table)
- Compound	<i>A substance that has only one type of particle, and all particles are made of two or more types of atom.</i>		Water Carbon dioxide
Mixtures	<i>A substance with two or more different kinds of particles.</i>		Orange juice Granola cereal with milk Salt water
- Heterogeneous	<i>A substance with two or more different kinds of particles that can easily be seen (a non-uniform combination of different types of substances)</i>		Granola cereal with milk
- Homogeneous	<i>A substance with two or more different kinds of particles, but the different types of particles cannot easily be seen (a uniform combination of different types of substances)</i>		Salt water

2. Page 152 Figure 2: (draw the chart here)



3. **Predict test questions:** Imagine that you are the teacher. Create 4 test questions (with answers) to assess students understanding of the concepts of section 5.1.

- a. Question  
i. Answer
- b. Question  
i. Answer
- c. Question  
i. Answer
- d. Question  
i. Answer

## Chapter 5.2 – Properties of Matter (page 157 to 163)

### 1. Concept summary chart

Concept	Definition
Physical Properties	<i>A property of matter that can be observed by the senses, measured, or calculated. (observed by sight, taste, smell, touch, hearing)</i>
- States of Matter	<i>Physical property describing the form in which the matter is found: solid, liquid, gas, or plasma</i>
- melting point	<i>The temperature at which a solid substance melts when being heated, or when a liquid freezes when being cooled.</i>
- boiling point	<i>The temperature at which a liquid substance boils when being heated, or when a gas condenses when being cooled.</i>
- solubility	<i>The degree to which a substance will dissolve in a given amount of another substance.</i>
- conductivity	<i>The ability of a material to conduct electricity or heat.</i>
- density	<i>The mass per unit volume of a substance.</i>
Chemical Properties	<i>The behaviour of a substance as it changes to a new substance.</i>
- flammability	<i>The ability of a substance to burn (react with oxygen and release energy as heat)</i>
- corrosion	<i>The reaction of some metals with oxygen to form metal oxides.</i>
- reaction with acid	<i>Some materials react with acid to form a gas. For example zinc reacts with hydrochloric acid to form hydrogen gas and zinc chloride.</i>

2. **Predict test questions:** Imagine that you are the teacher. Create 4 test questions (with answers) to assess students understanding of the concepts of section 5.2.

- a. Question
  - i. Answer
- b. Question
  - i. Answer
- c. Question
  - i. Answer
- d. Question
  - i. Answer

**Chapter 5.3 – Changes in Matter (page 166 to 169)**

**1. Concept summary chart**

Concept	Definition	Examples
Physical Change	<i>A change in form or state, but not in substance</i>	Cutting paper Melting ice
Chemical change	<i>A reaction in which a substance changes into one or more new substances with different properties</i>	Baking cookies Burning paper

2. **Identifying Chemical and Physical Change** – For each sentence, fill in the blank using one of the words written in (*brackets and italics*):

- a. When a **chemical change** occurs, a new substance \_\_\_\_\_ is \_\_\_\_\_ (*is/is not*) formed.
- b. When a **physical change** occurs, a new substance \_\_\_\_\_ is *not* \_\_\_\_\_ (*is/is not*) formed.
- c. \_\_\_\_\_ *physical* \_\_\_\_\_ (*physical/chemical*) changes **are** reversible (the substance can be changed back to its original form – the change **is not permanent**).
- d. \_\_\_\_\_ *chemical* \_\_\_\_\_ (*physical/chemical*) changes **are not** reversible (the substance cannot be changed back to its original form – the change **is permanent**).

3. **Predict test questions:** Imagine that you are the teacher. Create 4 test questions (with answers) to assess students understanding of the concepts of section 5.3.




- a. Question
  - i. Answer
- b. Question
  - i. Answer
- c. Question
  - i. Answer
- d. Question
  - i. Answer

**Chapter 5.4 – The Kinetic Molecular Theory and Changes of State**

**1. Kinetic Molecular Theory (KMT) - List the 5 principles that make up the KMT (refer to page 172, top of the page)**

- All matter is made up of tiny particles
- Different substances have different particles
- The particles are constantly in motion
- The more energy the particles have, the faster they move
- The attraction between particles decreases with an increase in distance between them

**2. States of Matter explained with the Kinetic Molecular Theory (refer to page 172 - Table 2)**

State of Matter	Solid	Liquid	Gas
Distance of particles from each other	Close together	Close together (but not as close as particles in a solid)	Very far apart
Type of motion of particles	Vibrate in place	Vibrate, and move past each other, bump into each other and the sides of the container	Particles move rapidly, vibrate, move past each other
Attractive forces between particles	High force, decreasing if the particles move faster when heated	High force, but not as high as in a solid.	No attractive forces.
Energy of particles	Increasing energy causes an increase in vibration	Increasing energy causes an increase in vibration and movement	Increasing energy causes an increase in pressure in the container
Diagram, showing the particles			

3. Complete each of the following sentences:

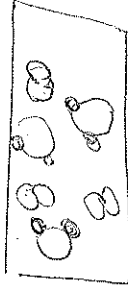
- When heat is added (added/removed) a solid can change to liquid state.
- When heat is removed (added/removed) a gas can change to liquid state.
- When heat is removed a liquid can change to solid (solid/gas) state.

4. Dissolving - Use the kinetic molecular theory to explain how salt dissolves in water:

- Explain in words (full sentences) - refer to the behaviour of the particles.

The particles of salt fit into the spaces between the particles of water. In this way, the total volume of the solution (mixture of salt + water) is less than the total volume of salt and water before they are mixed.

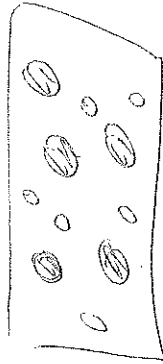
- Draw a diagram of salt dissolved in water, showing the particles and how they are mixed together.



- When 10.0 mL of water is mixed with 10.0 mL of isopropyl alcohol (rubbing alcohol), the resulting mixture has a volume of 18.6 mL. Use the kinetic molecular theory to explain why the total volume of the two liquids is less after they are mixed, than it was when the two liquids were in separate containers?
  - Explain in words (full sentences) - refer to the behaviour of the particles.

The particles of water and isopropyl alcohol fit into the spaces between each other. In this way, the total volume of the solution (mixture of water + isopropyl alcohol) is less than the total volume before they are mixed.

- Draw a diagram of isopropyl alcohol dissolved in water, showing the particles and how they are mixed together.



6. **Predict test questions:** Imagine that you are the teacher. Create 4 test questions (with answers) to assess students understanding of the concepts of section 5.4.

a. Question

i. Answer

b. Question

i. Answer

c. Question

i. Answer

d. Question

i. Answer