

STRAND	MATTER
SUB- STRAND	Investigating Matter
CONTENT LEARNING OUTCOME	Account for the Changes in States of Matter and the Processes involved

Changing States of Matter

- **What is Matter?** Matter is anything that has a mass (can be weighed) and occupies space (has a volume).
- All matter moves from all one state to another. For this to happen, it requires too much heat or pressure. The change of state happens when certain points are reached.
- This year, we will learn about the 3 States of Matter (Solid, Liquid and Gas).

Solid:

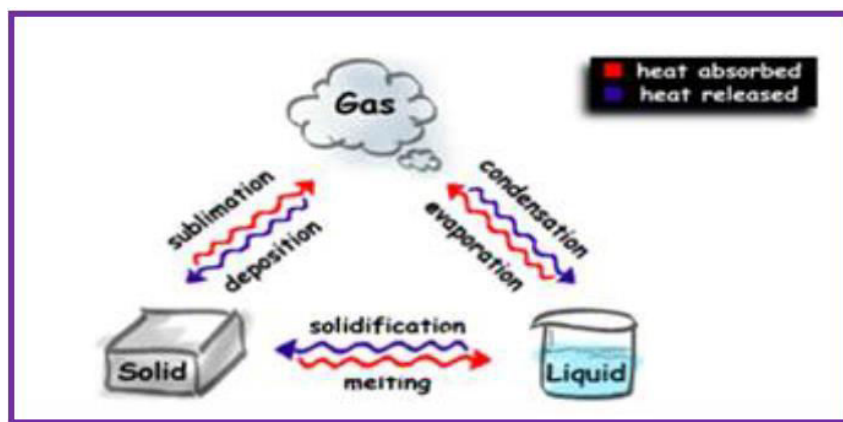
- Has fixed shape, cannot be compressed and cannot be changed easily
- The examples are the desks, books, chairs, blackboard and cups.

Liquid:

- The liquid takes up the shape of a container, for example juice poured into a glass tumbler will take up the shape of the tumbler.
- The Volume of liquids remains the same unless heated
- Water, soft drinks, orange juice are all liquids and have some solutes (solids suspended in them).

Gas

- Gases are not seen but it is made up of several gases such as Oxygen, Carbon dioxide, Nitrogen, Water vapour, and several other gases.
- Gases have weight and occupy space.
- Unlike solids and liquids, gases can be compressed and squeezed into smaller containers.

THE SIX PROCESSES OF CHANGE OF STATE OF MATTER**EVAPORATION AND DISTILLING**

- Mixtures are often separated when pure substances are needed from them.
- **Evaporation** is used to separate salt from the salt solution.
- This process removes **solvent** (liquid part of a solution) from a solution and leaves behind the **solute** (solid part of the solution) commonly known as the **RESIDUE**.
- The solution must be heated to drive away the solvent.
- **Distillation** involves two processes, **evaporation** and **condensation** will separate the solvent from a solution.
- **Distillation** is used in oil refineries to separate petrol, kerosene, motor oil and other products from petroleum, the mixture which comes from the ground.
- The apparatus used for distilling water and other solvents is called a **still**.

- Alcohol can be prepared from treated sugar cane juice by distilling in a still.

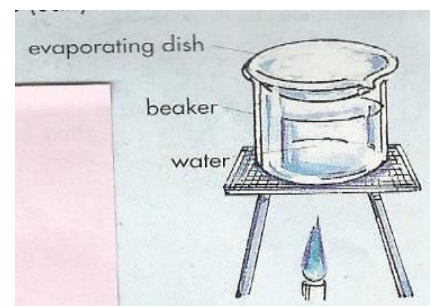
EXPERIMENT SEPARATING A SOLUTION BY EVAPORATION

AIM: To separate the solute (salt) from the solvent (water) in a salt solution.

MATERIALS

- Beaker (half filled with water)
- Evaporating dish
- Bunsen burner
- Tripod and gauze mat
- Salt solution
- Safety glasses.

Safety: Wear safety glasses whenever you are heating substances and do not get too close. When the water is almost evaporated turn off the gas as the remaining solution might start to spit



METHOD

- Set up your equipment as shown in figure on the side.
- We used the beaker of water as a **water bath**. This will heat the solution in the evaporating dish gently to prevent it spitting.
- We boiled the water in the beaker to heat the solution in the evaporating dish.

RESULTS AND DISCUSSION

- What substance did you try to evaporate from the solution? **Water**
- What substance do you think would be left on the evaporating dish? **Salt**
- Why did you use a water bath in this experiment?

This will heat the solution in the evaporating dish gently and prevent it from spitting.

Please note that you do not have to attempt this experiment at home. Instead, for detailed, step by step guide, visit the website

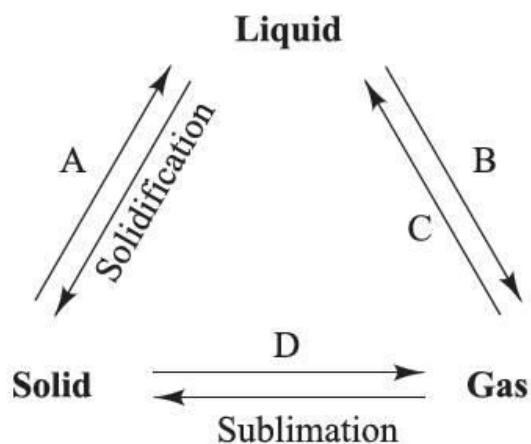
https://www.youtube.com/watch?v=Gbzdk8pTyM&ab_channel=MinistryofEducation%2CHeritage%26Arts.Fiji

ACTIVITIES

- Complete the table and write T (True) or F (False) in the appropriate grid cells.

State of Matter	Have Mass	Takes Up Space	Have Fixed Shape	Have Fixed Volume	Can be Compressed	Can be Poured
SOLID						
LIQUID						
GAS						

- Put in correct labels of the processes below.



- Complete the following sentences:

- In evaporation a liquid changes to a _____.
- The process of _____ is used to obtain salt from sea water.

c) In distillation a liquid is first _____ then _____. The _____ is left behind.

d) Some substances obtained by distillation are _____.