

Date: _____

Name: _____

The Changes and States of Matter (Part 1): An Introduction

This activity was created by Kajal.

To understand states of matter first we need to learn about matter and mass. Matter is anything that has mass and takes up space. Look around your room! Matter is all around you. All matter is made up of little particles called molecules, and mass is a number that tells us how close together these particles are.

The three states of matter are **solid**, **liquid** and **gas**. These states tell us how far apart the molecules in an object are.

The three states of matter:

Solid: The molecules in a solid state are super close together. They are so close together that objects in a solid state are hard and they don't easily change shape. Some examples of solids are a table, your clothes, and skateboard. Can you think of more?

Liquid: The molecules in a liquid are still close to each other, but not as close as they are in a solid state. Since the molecules are a little farther apart liquids can take the shape of any container (but it can also overflow). Some liquids are water, hot chocolate, and milk. How many more can you think of?

Gas: The molecules in a gas are very far apart. They are so far apart that sometimes they can let go of each other completely. They move around way more freely, this means that gas can fit in a bunch of different sized containers (without overflowing like liquids).

What's interesting is that we can change the states of matter! One way to do this is by adding or taking away heat (energy).

Some of the ways we can change states are:

Evaporation: we add heat to a liquid in order to excite the molecules. The matter then changes from a liquid to a solid.

Melting: we add heat to a solid to melt it, this results in a liquid.

Condensation: we remove heat from a gas to turn it into a liquid.

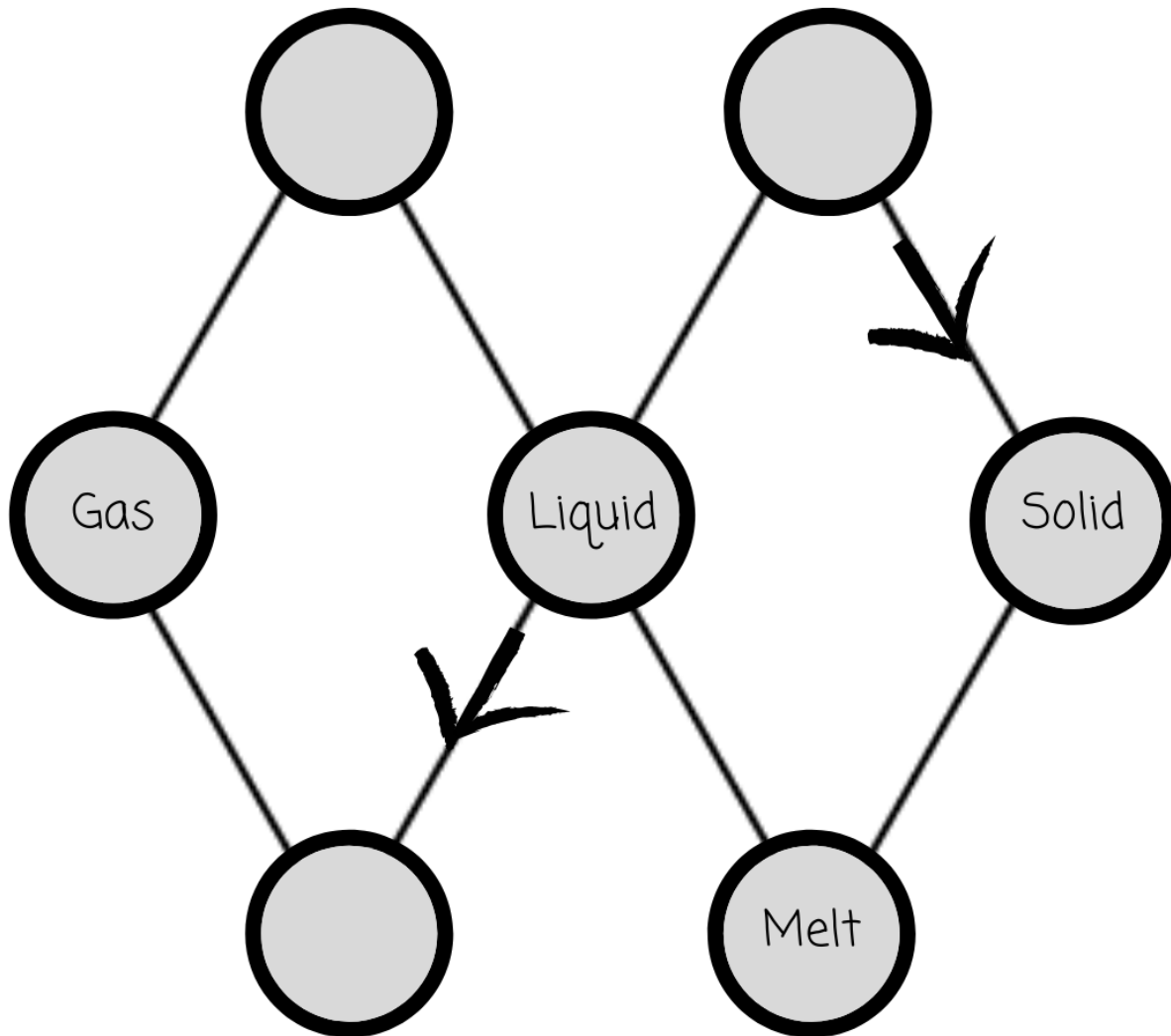
Freeze: we remove heat from a liquid by freezing it and it turns into a solid!

Can you figure out how these changes affect water? Look at the next page to try!

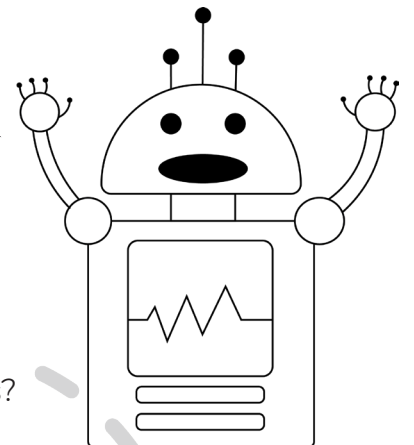
The Changes and States of Matter (Part 2): Changes in State

The diagram below is a graph! It shows us the process water goes through when it changes from one state to another. Label the bubbles below with the correct processes and draw the missing arrows to connect them.

The processes are: **condensation**, **evaporation**, **melting**, and **freezing**.



Did you know that computers like me often use graphs just like this to understand things? These graphs help computers relate things to each other!



Some changes are reversible! That means that you can change the material back to how it already was. You can find reversible changes on this graph by drawing loops. These 'loops' are called circuits.

For example, can you start at gas and follow the lines to get back to gas? That's a reversible change!