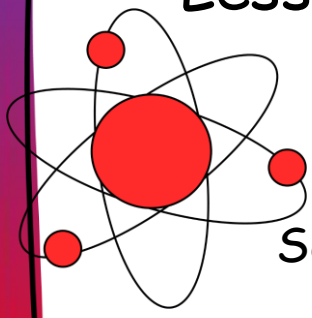
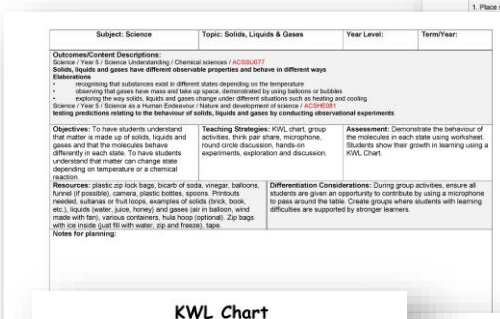
Solids, Liquids and Gases

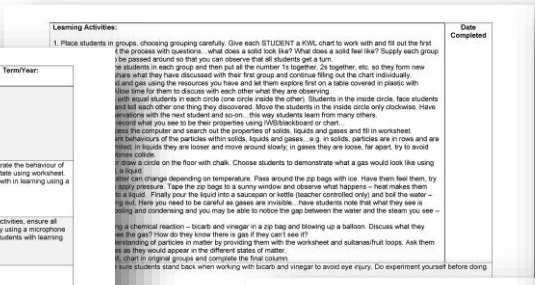
Lesson plan, experiments, worksheets & assessment.

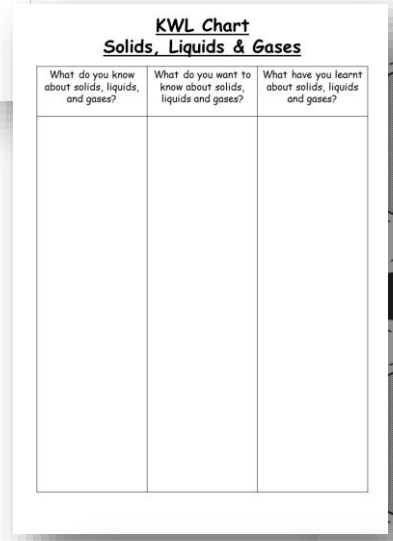
Australian Curriculum

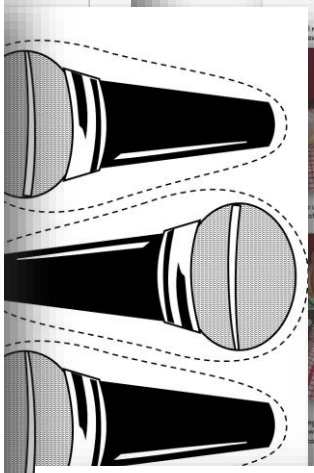
Science Year 5 – ACSSU077 and ACSHE081

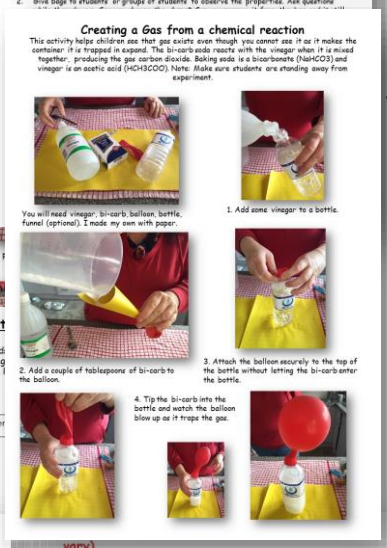


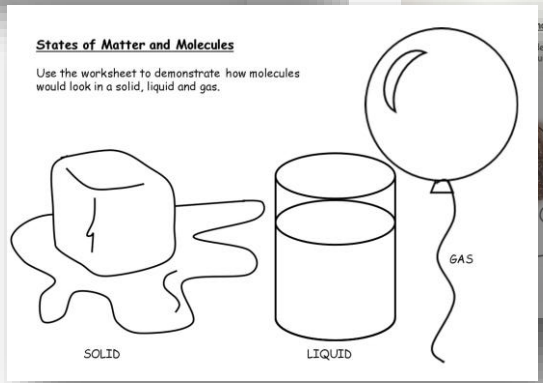


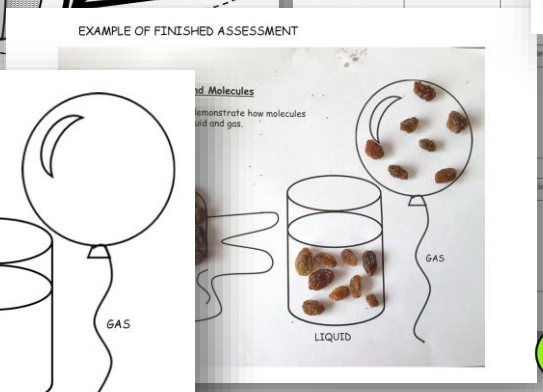


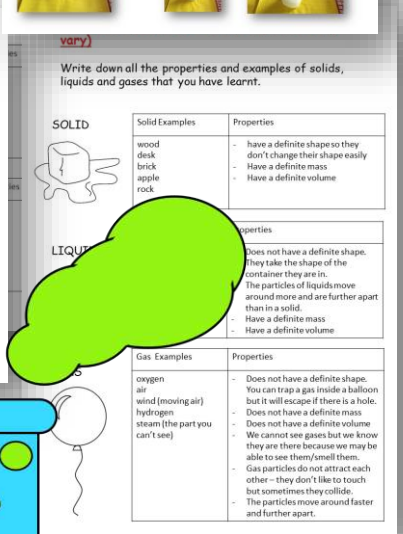


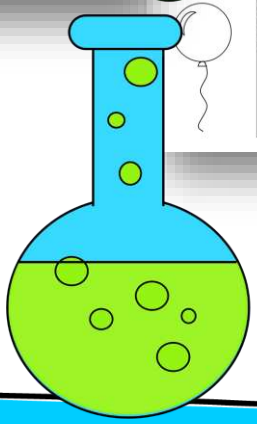










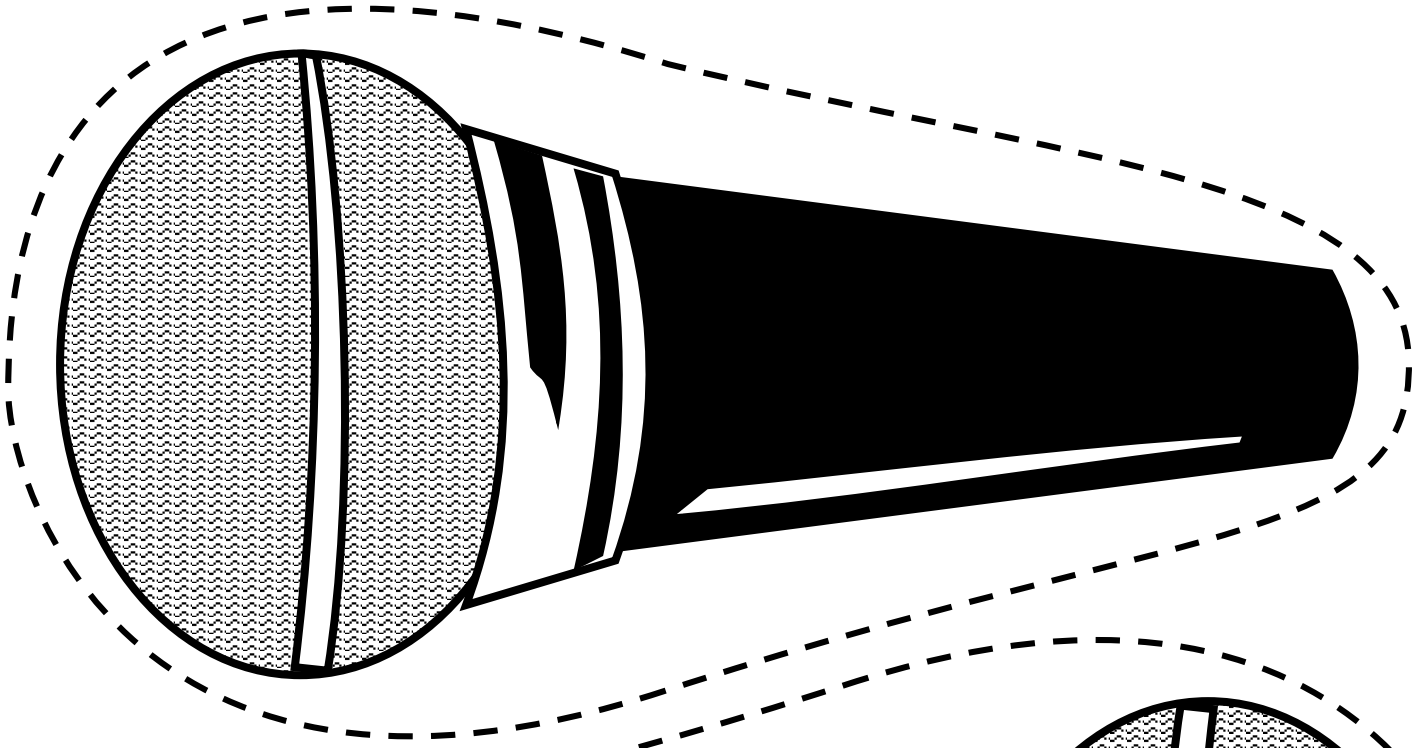


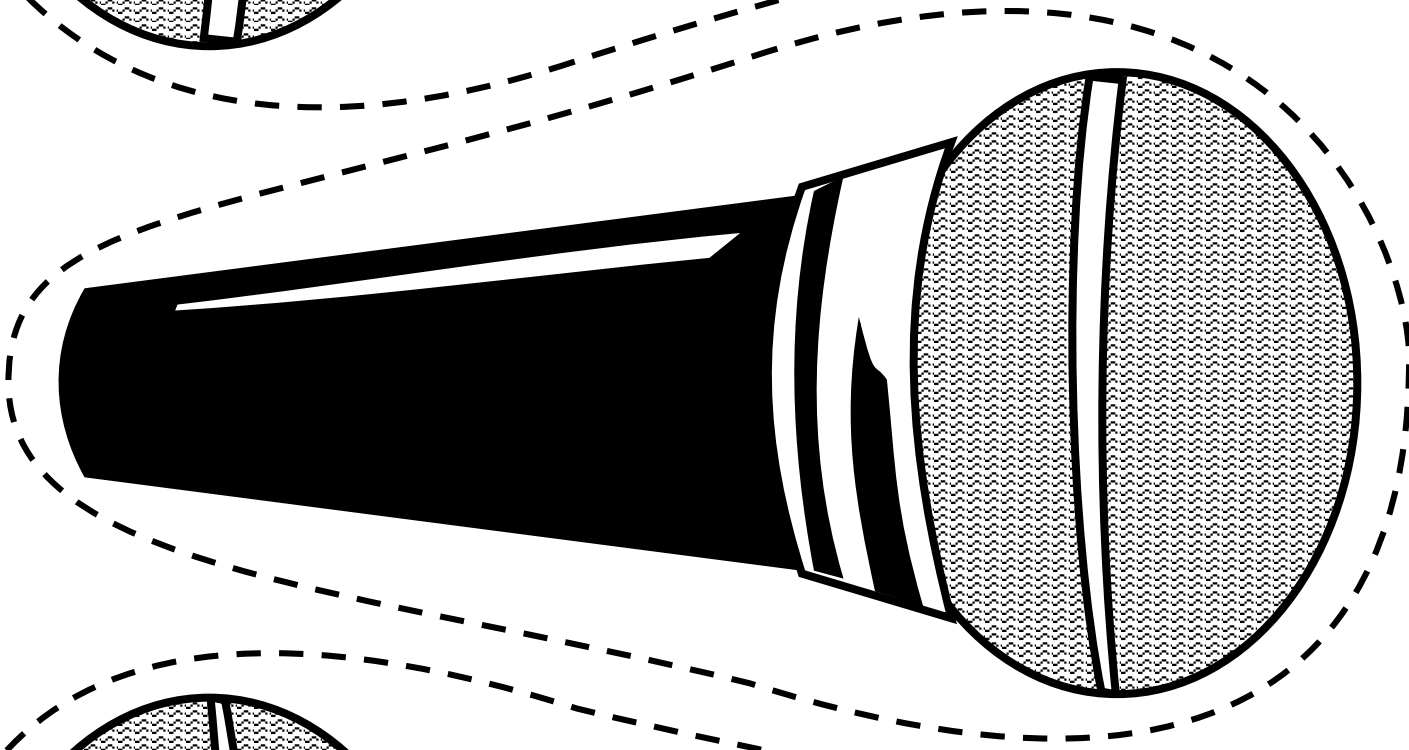
By TeachEzy – 11 pages

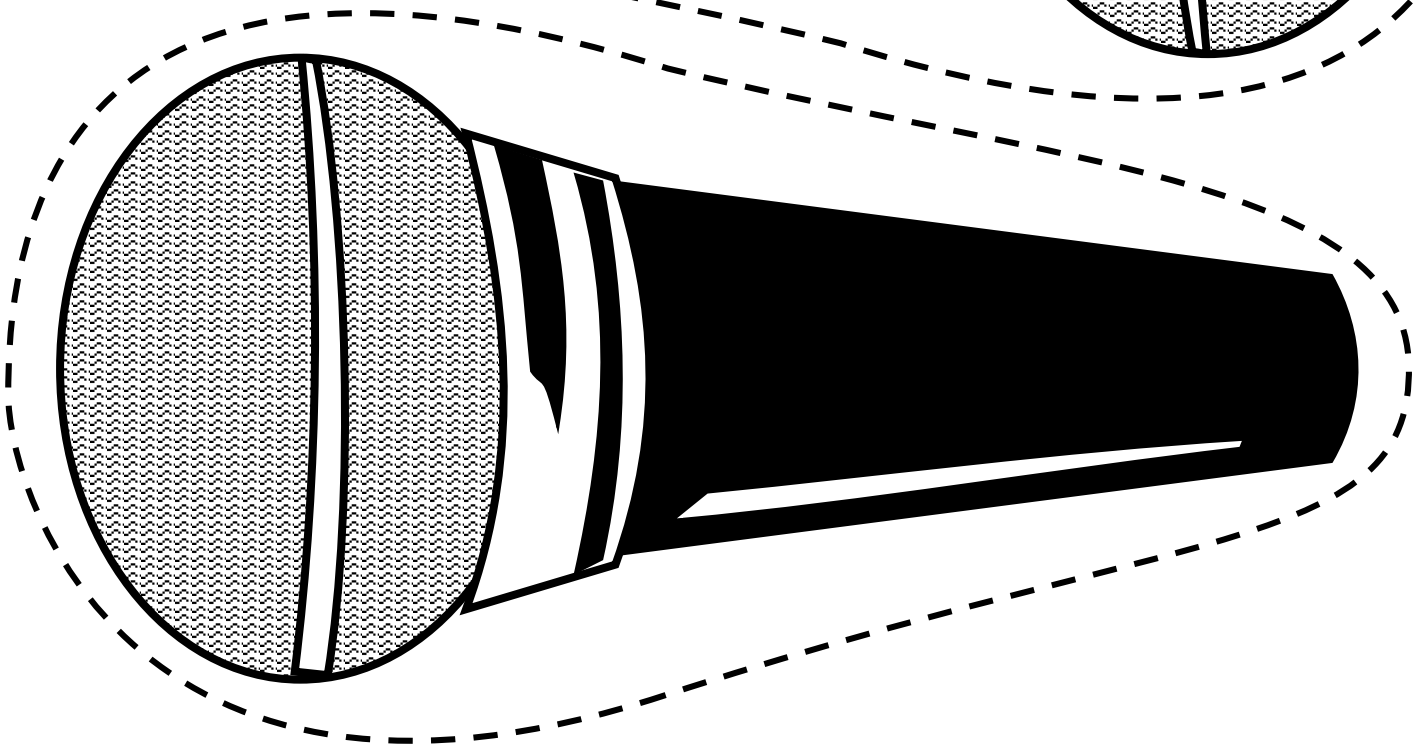
KWL Chart
Solids, Liquids & Gases

What do you know about solids, liquids, and gases?	What do you want to know about solids, liquids and gases?	What have you learnt about solids, liquids and gases?

Microphones for group activity.



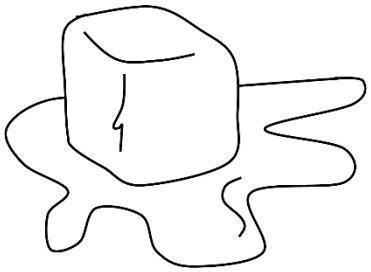




Properties of Matter

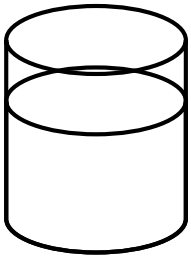
Write down all the properties and examples of solids, liquids and gases that you have learnt. Matter is what makes up everything around you…anything that takes up space. Properties describe how something looks, feels and acts.

SOLID



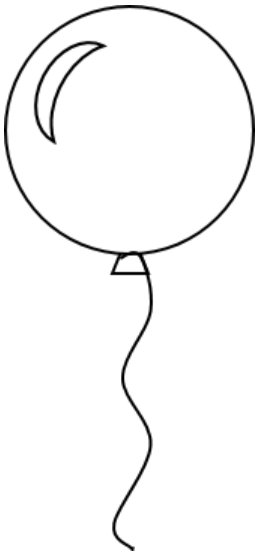
Solid Examples	Properties

LIQUID



Liquid Examples	Properties

GAS

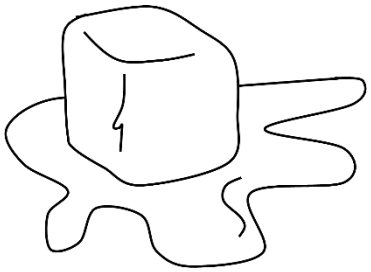


Gas Examples	Properties

Properties of Matter – example (answers will vary)

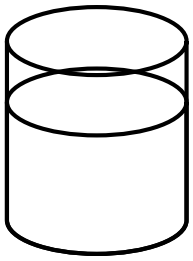
Write down all the properties and examples of solids, liquids and gases that you have learnt.

SOLID



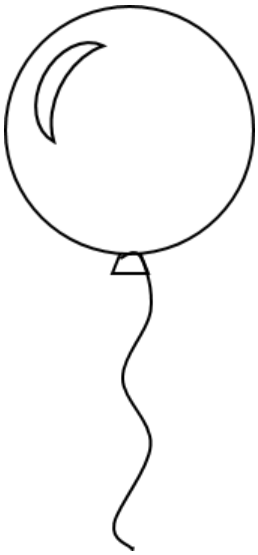
Solid Examples	Properties
wood desk brick apple rock	- have a definite shape so they don't change their shape easily - Have a definite mass - Have a definite volume

LIQUID



Liquid Examples	Properties
milk water oil juice	- Does not have a definite shape. They take the shape of the container they are in. - The particles of liquids move around more and are further apart than in a solid. - Have a definite mass - Have a definite volume

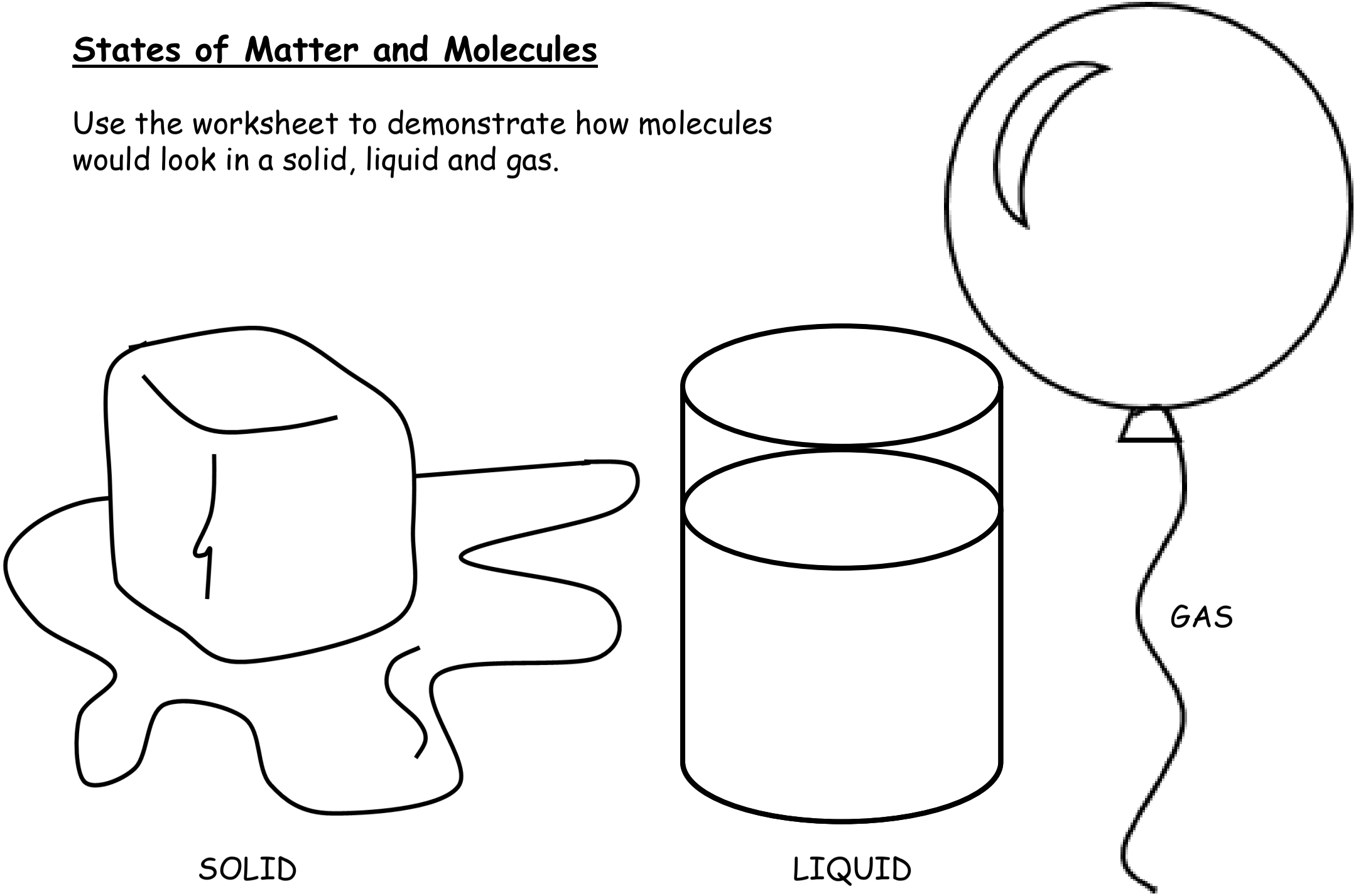
GAS



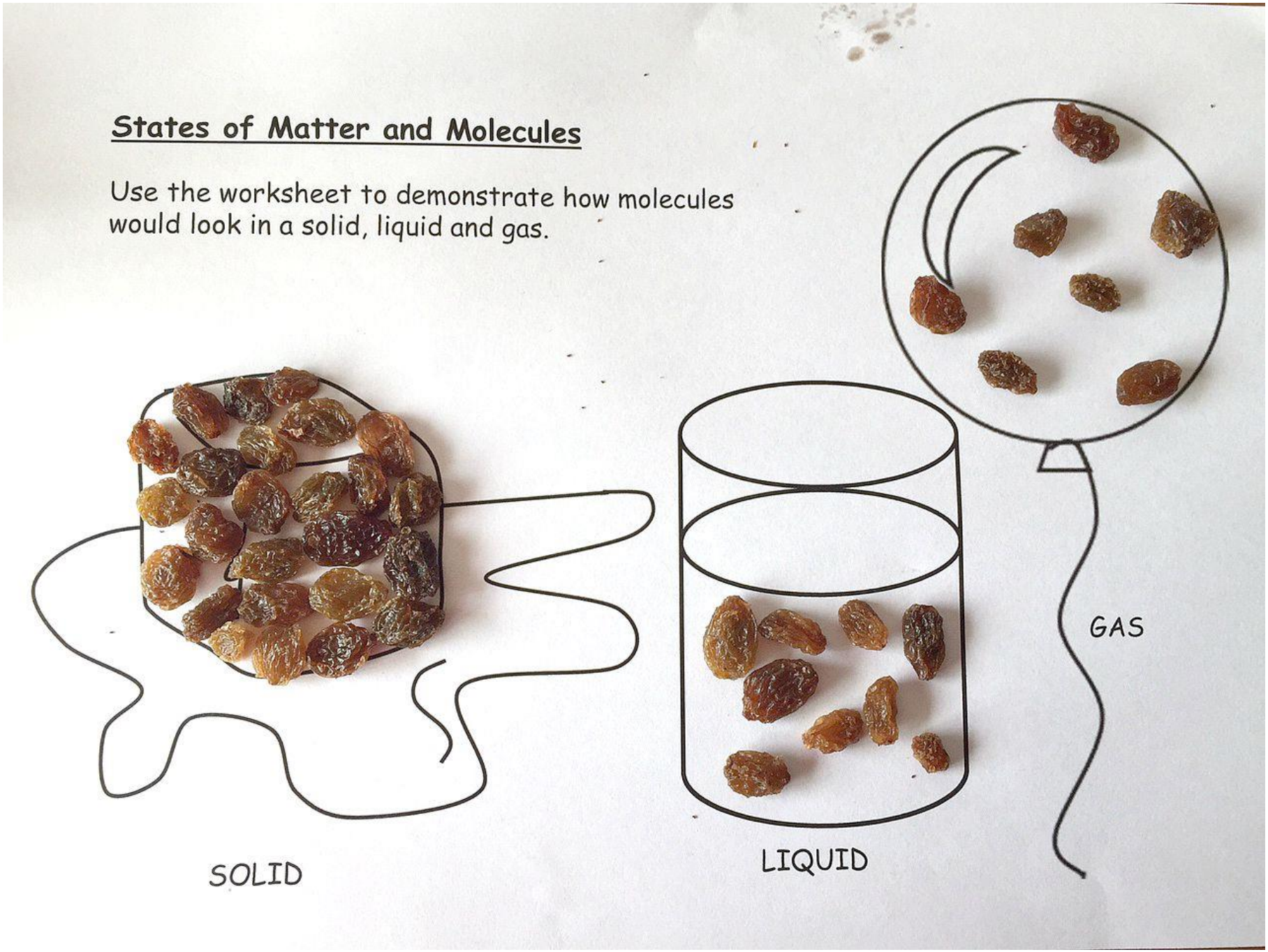
Gas Examples	Properties
oxygen air wind (moving air) hydrogen steam (the part you can't see)	- Does not have a definite shape. You can trap a gas inside a balloon but it will escape if there is a hole. - Does not have a definite mass - Does not have a definite volume - We cannot see gases but we know they are there because we may be able to see them/smell them. - Gas particles do not attract each other – they don't like to touch but sometimes they collide. - The particles move around faster and further apart.

States of Matter and Molecules

Use the worksheet to demonstrate how molecules would look in a solid, liquid and gas.

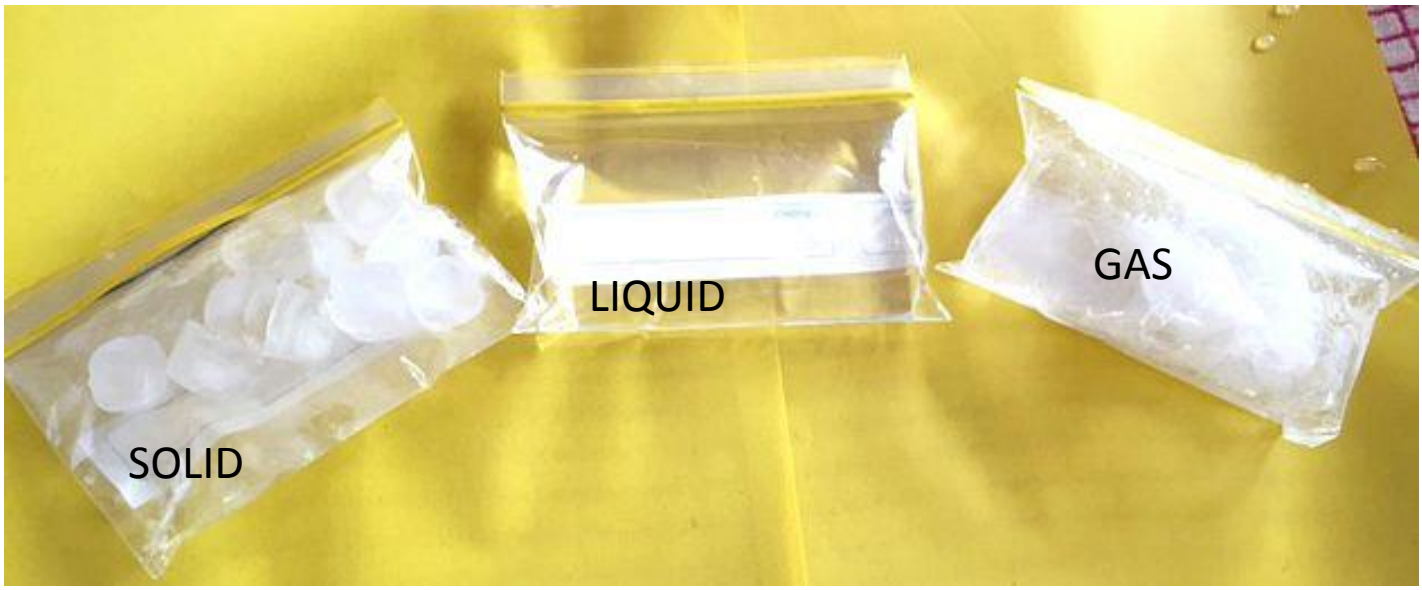


EXAMPLE OF FINISHED ASSESSMENT



Changing Matter from one state to another Experiment

Adding energy to matter can cause the matter to change from one state to another. Here we are adding thermal energy (heat) to change from a solid to a liquid to a gas…ice to water to steam (or vapour). You can reverse this by taking away energy – allowing steam to turn back to liquid and freezing the liquid to become ice. You can also change matter motion and pressure. When heat is applied to a solid, its particles begin to vibrate faster and tend to move farther apart. They move even further apart and move even faster as the liquid turns into a gas.



You can do a simple experiment to show how matter changes from one state to another by using water.

1. Add water to zip lock bags and freeze overnight.
2. Give bags to students or groups of students to observe the properties. Ask questions while they do, e.g. Can you change the shape? Can you remove it from the bag and it still stay the same?
3. Using tape, tape the bags to a sunny window and observe what happens. Get children to observe properties again, e.g. can you change the shape? Would it stay the same shape if you removed it from the bag?
4. Pour all the water from the bags into a saucepan or kettle. Boil the water until it turns into steam. Note you can't see gases, so the steam that you see is the gas condensing (to change from a gas into a liquid). If you look closely, you should be able to see a gap between the kettle/saucepan and the steam that you see.
5. If you want to go another step…the water can then be frozen again.

Dr Karl on Steam @ https://twitter.com/doctorkarl/status/601333513091178496
Describing the invisible properties of gas on TedEd @ http://ed.ted.com/lessons/describing-the-invisible-properties-of-gas-brian-bennett

Other ideas
– place chocolate, butter, ice cream, ice blocks (solids) on a plate in the sun and observe what happens.
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Creating a Gas from a chemical reaction

This activity helps children see that gas exists even though you cannot see it as it makes the container it is trapped in expand. The bi-carb soda reacts with the vinegar when it is mixed together, producing the gas carbon dioxide. Baking soda is a bicarbonate (NaHCO3) and vinegar is an acetic acid (HCH3COO). Note: Make sure students are standing away from experiment.

You will need vinegar, bi-carb, balloon, bottle, funnel (optional). I made my own with paper.

1. Add some vinegar to a bottle.

2. Add a couple of tablespoons of bi-carb to the balloon.

3. Attach the balloon securely to the top of the bottle without letting the bi-carb enter the bottle.

4. Tip the bi-carb into the bottle and watch the balloon blow up as it traps the gas.

Creating a Gas from a chemical reaction 2

This activity helps children see that gas exists even though you cannot see it as it makes the container it is trapped in expand. The bi-carb soda reacts with the vinegar when it is mixed together, producing the gas carbon dioxide. Baking soda is a bicarbonate (NaHCO3) and vinegar is an acetic acid (HCH3COO). Note: Make sure students are standing away from experiment as the zip lock bag can burst.

You will need vinegar, bi-carb, zip-lock bag and paper towel or tissue.

1. Wrap up a couple of tablespoons of bi-carb into a tissue or paper towel and place it into one corner of a zip lock bag.

1. Holding the corner where the bi-carb is, add vinegar to the bag and quickly seal the zip lock. Stand away from the bag and make sure it is in a sink or outside. Watch the vinegar react with the bi-carb and expand the zip lock bag. It may make the bag BURST, so be aware of safety.