

Year 4 Autumn 1 topic – In a State

In the first lesson, children compared and grouped materials together, according to whether they were a liquid, a solid or a gas.

20/9/23 # a A a A

Solids	Liquid	Gases
Clay ✓	Tea ✓	Hot-air-balloon ✓
Sugar ✓	Lemonade ✓	Kettle ✓
Glass ✓	Sand ✗	
Sponge ✓	Honey ✓	
Fabric ✓	Cream ✓	
metal ✓	Ice-lolly ✓	
wool ✓	Soup ✓	
Paper ✓	Ice ✓	
Sand Sand ✓	Juice ✓	




key ⊕ #

IF all materials were Solids: ...!

they will be no drinks. ✓

Children then looked at the particle arrangements of the three states of matter.

Particle Properties

State	Particle Arrangement	Particle Properties	Material Properties
solid		Particles are closely packed in a regular pattern. They vibrate on the spot.	Keeps its shape unless a force is applied to it. Remains the same volume.
liquid		Particles are close together but random. They can move over each other.	Takes the shape of the container it is in. Stays the same volume.
gas		Particles are spread out and can move about quickly in all directions.	Does not keep its shape. Can spread out to fill the space it is in.

What is key

1. Everything around you would be hard.

2. You couldn't breathe.

3. You couldn't eat or drink.

Challenge - what is?

1. If water couldn't freeze almost the entire Arctic would melt and half the world be under water.

2.

To accompany this, children worked collaboratively to match the material properties to the correct state of matter.

PROPERTIES OF SOLIDS AND LIQUIDS: CHALLENGE 2

Use this chart to write down the properties of solids and of liquids.

Solids	Liquids
<p>rigid rigid fixed shape</p> <p>• keeps its shape.</p> <p>can be spread</p> <p>• It will not change their own.</p> <p>are sticky</p> <p>are opaque</p> <p>They can be squashed or soft.</p> <p>• They can be cut, squashed or crushed</p> <p>are transparent</p> <p>hard</p>	<p>liquids can change their shape.</p> <p>• they do not change their own shape.</p> <p>They can be slow</p> <p>are transparent</p> <p>It makes pools.</p> <p>can spread out</p> <p>are sticky</p> <p>are not</p> <p>can be poured</p> <p>always stays same shape.</p> <p>can slow.</p>

In a practical lesson, children investigated the weight of gas. Children used fizzy drinks bottles and scales for this investigation.

Sci 20.9.2023 (A) (ASA)

to: To investigate gases and explain their properties.

water is solid

bottle is solid

plastic is solid

drink is liquid

liquid

CO₂ (Fizz) gases

Fizz is gases

Weight as coke = 390g

Weight as coke = 380g after shaking.

Sci 19/10/23 (A) (A)

Comparing Gases

to: To investigate gases and explain their properties (A)

Maya wants to find the fizziest drink to serve to her friends at her party. You will set up a comparative investigation to find out which fizzy drink has the most carbon dioxide in it, as this is likely to be the fizziest drink. You will weigh each fizzy drink, then shake it until it is flat and weigh it again. The difference between the two weights will tell you how much carbon dioxide is in each drink.

Have a look at the different drinks. Which one do you predict has the most carbon dioxide in it and why?

I predict that cola will be the fizziest drink. My prediction is wrong.

How will you know when the fizzy drinks are flat? Think about the bubbles you can see.

How can you make sure your investigation is reliable? Think about what you need to keep the same every time.

We kept everything the same. Such as we kept the time of shaking the same. Amount of drink, the same cap.

Carry out the investigation and complete the table of results below.

Name of drink:	Weight when fizzy:	Weight when flat:	Weight of carbon dioxide (the difference between the two weights):
Apple cola	391 grams	387 grams	4g
Apple lemon	392 grams	385 grams	7g
Apple lemonade	392 grams	387 grams	5g

Look at your results and come to a conclusion. Which fizzy drink has the most carbon dioxide in? Which drink should Maya serve to her friends at her party? Was your prediction accurate?

The results are that lemon is the fizziest because it had the most carbon dioxide which made bubbles. 7g.

Children also observed gases through the paper towel in the cup experiment. Children took it in turns to submerge the cup into the bowl of water whilst the paper tissue was inside it.

Next step is to write differences
all have gas in them
all have air in them
all way something

OBSERVING GASES: CHALLENGE 2

ACTIVITY 1: PAPER TOWEL MAGIC

What happens when you put the cup in vertically?
~~The tissue will~~ not touch the water because
the air stops it from touching.

What does the air do?
It will block the water from touching
the tissue tissue.

What happens when you tilt the cup?
~~The tissue~~ touched the water and it got
in and got the tissue wet.

Where does the air go?
~~To the surface of the water.~~ The air
escaped into the atmosphere.

Where does the water go?
It went into the cup.

