

Baking it

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Lesson 1 – researching bread from around the world

Lesson 2- Investigating yeast

Our unit for this half term is ‘Baking It’.

In this unit, you will be investigating how the various ingredients we use in bread-making change state during the cooking process. Have you ever made bread at home? Think about the question below.

- What ingredients do we use to make bread?
- How is bread made?
- What types of bread are there?
- Is bread good for our health?



Task 1-Wednesday



Bread is a basic food staple for people all over the world. It belongs to the food group known as 'carbohydrates', which provide us with energy.

Research on the internet bread-making recipes. Look for recipes for sourdough, chapatis, naan, pitta, matzo, ciabatta.

Think about what is the same and what is different in the recipes for these breads.

The Basic Ingredients

The basic ingredients for making bread are: flour, water, sugar, yeast and salt.

We can make bread without using yeast (unleavened bread or flatbreads such as pitta and matzo are made without yeast). However, in this unit for science purposes, we are going to use yeast because it can teach us about gases.

Leavened bread (yeast)



Unleavened bread (no yeast)



Friday

Let's review solid, liquid and gases

Everything in our Universe is made up of tiny particles called atoms, including the Earth itself and everything that exists: the air we breathe, our bodies, plants, animals, materials, objects, etc.

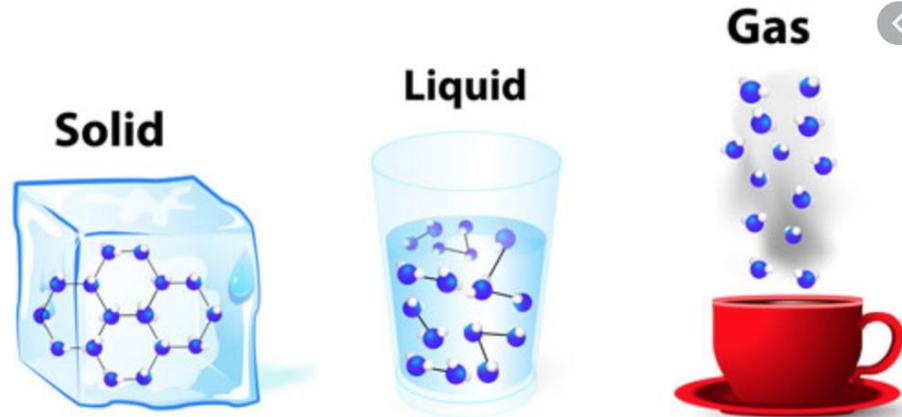
Atoms are much too small to see. Atoms don't usually exist on their own; they join up with other atoms to make molecules.

The way that molecules are arranged and interact with each other determines whether they are a solid liquid or gas.

States of Matter

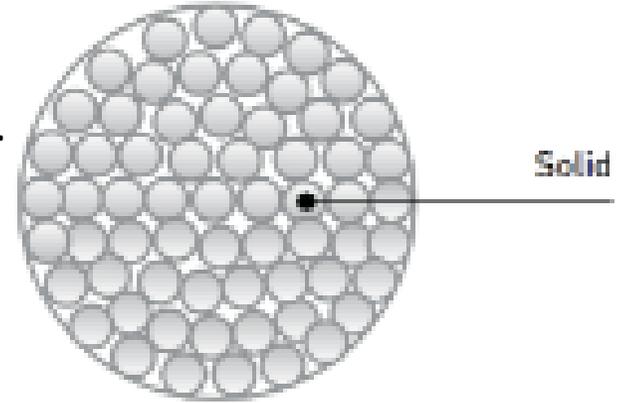
Materials can generally exist in three states – solid, liquid, and gas.

- **Solid** – a material that has a fixed shape and volume, e.g. if you put a solid into a container it will not change shape
- **Liquid** – a material that has a fixed volume but can change shape, e.g. if you pour liquid into a container it will take the shape of the container
- **Gas** – a material that can change in shape and volume, e.g. if you put gas into a container it will take the shape of the container and fill it

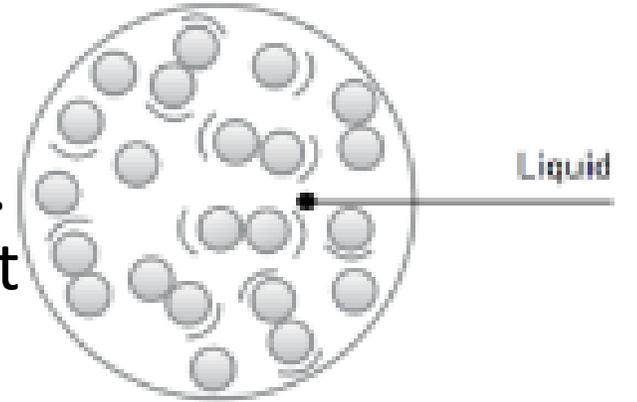


States of Matter

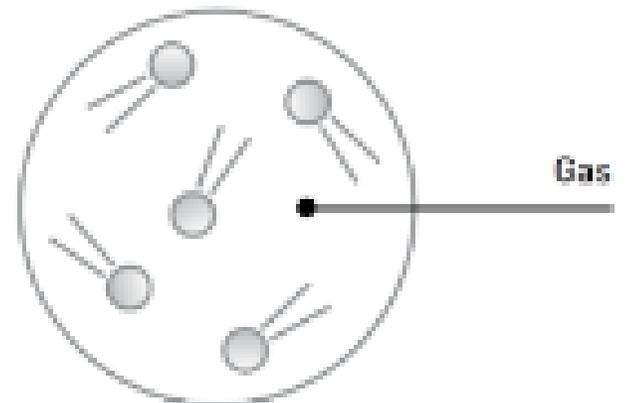
Solids have molecules crammed together in a fixed shape – often a lattice.



Liquids have molecules that are freer to move. When you pour milk into a bowl, the milk takes the shape of the bowl. You'd be surprised if a packet of butter did the same, except on a hot day!



Gases are freest to move. They expand to fill any space available. Balloons can be filled with air – the air doesn't collect down one end of the balloon.



Can you group the ingredients for making bread into: solids, liquids and gases?

Can you explain the reasons for putting them in these groups?

Solid

flour



yeast



Liquid

sugar



salt



Gas

water



Yeast

Yeast is a fungus that can be activated by adding warm water and sugar. When we activate yeast we say it is 'live'.

What does 'live' mean?

What are the properties of living things, and does yeast fit these criteria?

Task 2: Let's investigate how yeast behaves.

You will need:

- 1 teaspoons yeast (this has been posted to you)
- 1 teaspoon sugar
- 150 ml warm water (1 part boiling to 2 parts cold)
- Small bowl



Start by mixing the yeast and sugar in the bowl and then gradually adding the warm water. Whisk thoroughly and bubbles will start to appear.

What do you think the bubbles are? What has happened to the sugar and the yeast?

The sugar has dissolved. This means that they have become part of a liquid.

The yeast forms a suspension in the water and gives off a gas.



Cover the bowl with a cloth and leave in a warm place for about 25-30 minutes.

What do you think will happen and why?

Continue to the next slide for more instructions.



Task 2: continued

The yeast is suspended in the water and makes froth (a gas). **What do you think the froth is?**



It is bubbles of **carbon dioxide** from the yeast. A chemical reaction takes place when we combine these three ingredients and we make a new material.

If you have any extra yeast at home you could also investigate how to make the most froth from yeast. You could change the temperature of the water (warmer/cooler), the temperature of the place where you leave it (hotter or cooler place), the amount of sugar (more/less) or the amount of time that the yeast is left to froth. **Remember to only change one thing at a time.**

What we have learned

- Yeast is a fungus (similar to a mushroom) and it is an active (or live) ingredient that we can 'feed' with water and sugar.
- Yeast will grow in warmer temperatures.
- Carbon dioxide is a gas.

Why do we want to put carbon dioxide in our bread?

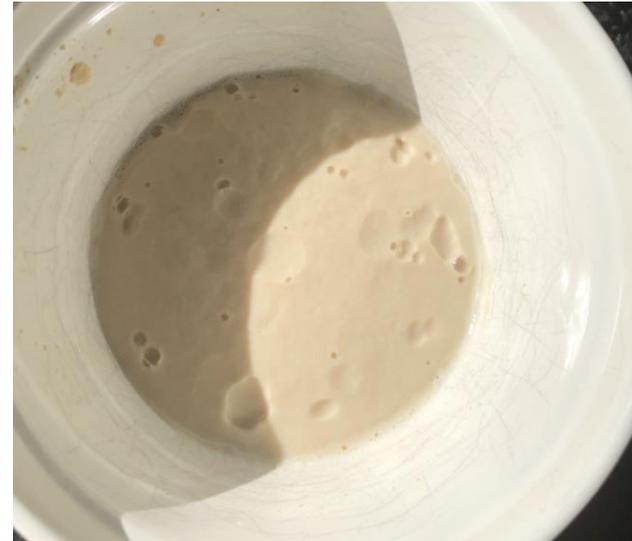
Why do we want to put carbon dioxide in our bread?

- It makes bread rise
- It makes holes in the bread
- It makes bread lighter (less heavy or dense)

After 15 minutes



After 45 minutes



After 45 minutes there was far more froth on top of the yeast mixture which means that more carbon dioxide was formed.