Friday 9th July 2021

WALT: Conduct a fair test

Vocabulary:

solution
solute
solvent
dissolve
soluble
insoluble
hypothesis
fair test

Prior learning:

What does it mean to be a scientist?

What is a solution?

I am a scientist…

I want to **explain** the world around me.

I **question** everything.
How?
What?
Why?

I make a **prediction**.
I **investigate** then use what I find out to **explain**.
I **change my mind** after finding things out.

Learning Journey

1. Understand the structure of atoms and elements

2. Understand how solutions are formed

3. Use scientific knowledge to create a hypothesis

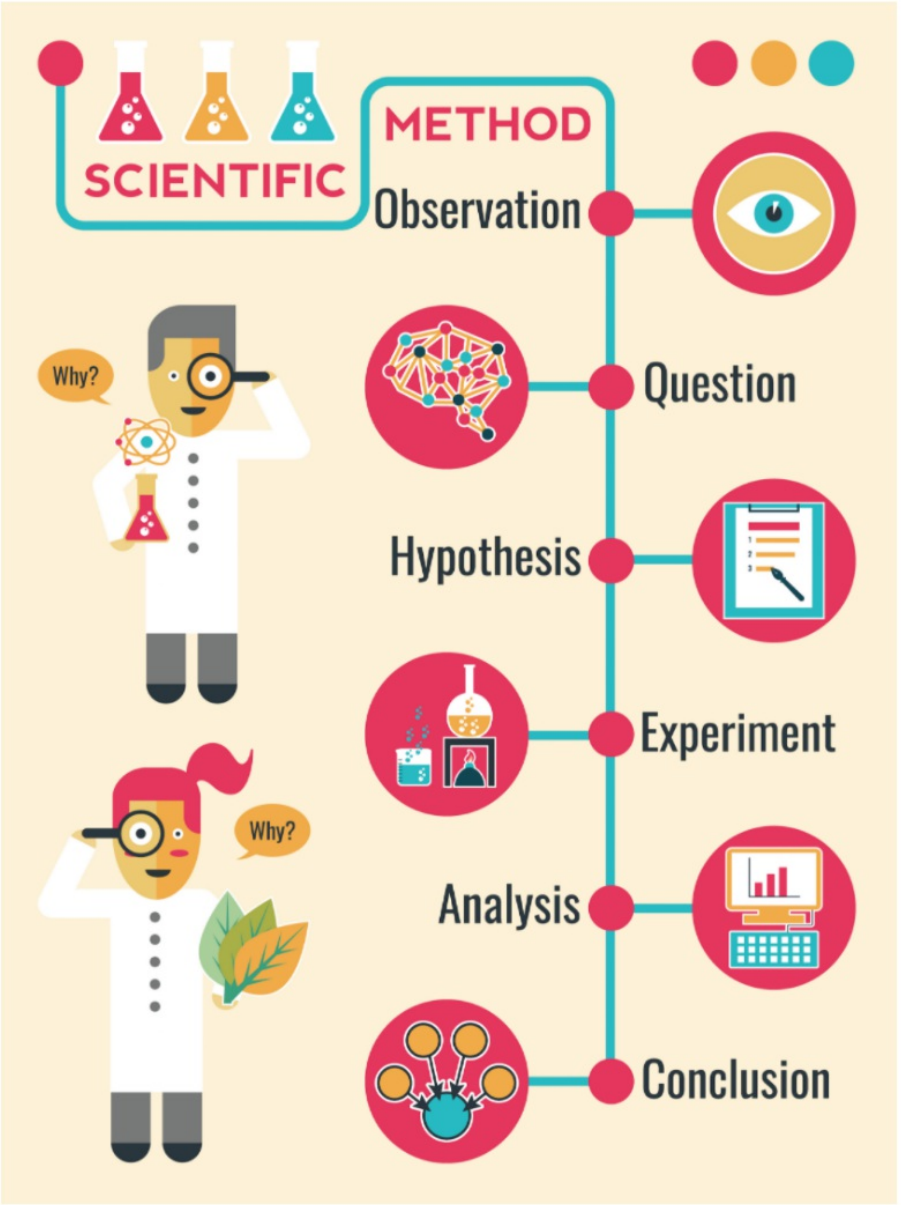
4. Set up a fair test

5. Plan, write and edit/revise a scientific report

6. Publish and present findings

We are going to carry out an investigation to discover whether different materials are **soluble** or **insoluble** in water.

Share your hypothesis in the chat - do you agree or disagree? Why?



As scientists, we need to ensure that every test or investigation we carry out is fair…

What will we change each time?

*This needs to be **one** thing only, everything else needs to stay the same each time.*

<u>You will need:</u>

glass
measuring jug
teaspoon
timer
salt, sugar, flour, rice, gravy, coffee

The aim of the investigation is to determine whether all materials are soluble.

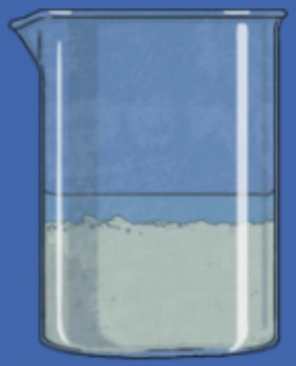
To ensure the test is fair, there are a number of controlled variables. The amount of water the material is stirred into is always ____ ml. The amount of material is always _______. The number of times the material is stirred into the water will always be _______.

The independent variable that will be deliberately changed each time is _____________.

The dependent we are measuring is whether the material will dissolve in the water or not.

We will mix each material with water.
If the material does dissolve, the water will be transparent. It may have changed colour but will be see through. You will not see the particles of solid any more.

If the material does not dissolve, you will still see the particles of the solid in the water.



Record your results here →

Title of experiment:	
Purpose/Introduction:	
Hypothesis	
Materials	
Method	
Results	
Discussion	
Conclusion	

We can now complete the discussion and conclusion part of our report.

What did you discover?

Why do you think this happened?

Can you draw on any patterns or relate this to anything you already know?

Title of experiment:	
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Rice grains have huge and fibrous carbohydrates called starch. That starch is **insoluble in water**. You can break down the starch, make it simpler which will make it **soluble**.

Flour is not **soluble in water** as it is mostly made of starch, which has a tightly packed helical structure that prevents it from bonding with **water** molecules, thus making it **insoluble in water**. **Flour** also contains the protein gliadin and some lipids, both of which are **insoluble in water**.

When **salt** is mixed with **water**, the **salt dissolves** because the covalent bonds of **water** are stronger than the ionic bonds in the **salt** molecules. ... **Water** molecules pull the sodium and chloride ions apart, breaking the ionic bond that held them together.

The bond between the oxygen and hydrogen atoms (O–H bond) in **sugar** (sucrose) gives the oxygen a slight negative charge and the hydrogen a slight positive charge. ... The polar **water** molecules attract the negative and positive areas on the polar sucrose molecules which makes sucrose **dissolve in water**

Coffee will only fully **dissolve in water** if you are using instant **coffee** granules. If you are using ground **coffee** beans then the **coffee** will not fully **dissolve**, only 30% will **dissolve** and the other 70% will remain intact. ... **Coffee** falls into the category of part **soluble**.

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