Science - Year 5

Properties and changes of materials – Block 5PCM

Changing Materials Education Pack

Session 1

Resource Pack

Definition Game Cards

(Print on thin card and cut out keeping definitions and terms separate)

SOLUTE	The substance that dissolves in a liquid to make a solution
SOLUTION	A liquid consisting of a solvent in which one or more substances have dissolved
SOLVENT	A liquid in which a substance is dissolved to make a solution
SOLUBLE	A substance is soluble if it dissolves in a solvent
SOLUBILITY	A measure of how much solute dissolves in a solvent
INSOLUBLE	A substance is insoluble if it does not dissolve in a solvent

Solutions

SOLUTION: when a substance is dissolved in a liquid.

Not all substances dissolve, we say that those that do are called SOLUBLE, and those that don't are called INSOLUBLE.

The liquid that the substance dissolves in is called the SOLVENT.

The soluble substance that dissolves in the liquid is called the SOLUTE.

SOLUTE + SOLVENT = SOLUTION

e.g. salt + hot water = salty water

Guidance for completing investigation

Equipment:

- Solids to test for solubility:
  - Crushed biscuits
  - Flour
  - Baking powder
  - Coffee (instant and filter)
  - Salt
  - Oil **(use a cooking oil)**
  - Sugar
  - Cocoa powder
  - Andrew's salts or Alka Seltzer® tablets
  - Ready Brek
  - Plaster of Paris **(check your school's policy – you may wish to use Alginate)**
  - Cement **(be aware that you should not ever touch wet cement with bare skin)**

- Beakers
- Glass rods or old spoons for stirring
- Goggles
- Stop watches
- Thermometers

Suggested process:

1. Fill beakers with a given amount of tap water
2. Put a set amount of substance in (e.g. 1tsp, or 5g) and stir for 1 min
3. Inspect with a magnifying glass
4. Leave for 5 mins to see if any sediment settles on the bottom
5. Classify as soluble or not

Ensure you have identified those variables that need to remain the same in order for the investigation to be 'fair'.

Further investigation might involve different temperatures of water/different volumes of substance or water.

Sticky-note investigations (after Goldsworthy and Feasy, 1997)

Place filled in sticky-notes on the blank boxes to help organise thoughts - the sticky-notes can be moved as the investigation plan progresses

Enquiry question:

VARIABLES

Thing I could change/vary

Thing I could observe or measure

Ensuring my test is fair		
I will change		
I will observe		
I will keep these things the same		

Predicting	
The materials that I think will dissolve	
The materials that I think will not dissolve	

Results and patterns	
Material	**What I observed**

Results and patterns	
Material	**What I observed**

Predictions

What do you think will happen when you mix these materials with water?

Material	Prediction
cement	
small seeds	
flour	
baking powder	
cocoa powder	
salt	
sugar	
Plaster of Paris	
Andrew's salts or equivalent	
coffee	
Ready Brek	
oil	

Findings

Material	Dissolved	Did not dissolve (formed sediment)	Reacted with water to form new substance	Observations/explanation
cement				
small seeds				
flour				
baking powder				
cocoa powder				
salt				
sugar				
Plaster of Paris				
Andrew's salts or equivalent				
coffee				
Ready Brek				
oil				

Guidance for education pack

In this initial section of your education pack, make sure that you include:

1. Clear enquiry questions
2. Clear instructions for the investigation
3. A diagram demonstrating how the investigation is set up
4. Guidance on ensuring the test is 'fair'
5. Possible further investigation suggestions
6. Include some key learning outcomes (see examples below)

Try and design your layout to complement the current Science Kitchen resource (see QR code below) - bear in mind that it needs to be printed off as well as make a great webpage.

(http://www.sciencemuseum.org.uk/~/media/Educators/Educators_downloads/kitchen_science.pdf)

Sample key learning outcomes:

- *Investigators will carry out fair tests*
- *Investigators will identify solids that dissolve or in water to make a solution*
- *Investigators will spot 'soluble 'patterns when the temperature of water is varied*

Guidance for Pinterest boards and QR codes (*pupil focus*)

How to add to your Pinterest board:

Your teacher will have created a Pinterest log on (make sure that you are logged in) and board for your gp (or you can create your own board). You will need to 'pin' your webpage containing your investigation to this board. Keep an eye out for other websites or images that you might want to add to your Pinterest board.

To save a Pin using the browser button *(if your teacher has installed the Pinterest browser button*)

- Click the browser button (the P) on your browser's toolbar
- Find your favourite image and click Save
- Add or edit the description
- Pick the board you want to save to

To save a Pin without using the browser button:

- Click + at the top right corner of Pinterest and choose Add from a website
- Type in the website URL
- Click Find Images
- Find your favourite image and click Save
- Add or edit the description
- Pick the board you want to save to

Add, edit or delete, Pinterest
https://help.pinterest.com/en/articles/add-edit-or-delete-pin#Web

QR codes:

Visit this website and add in your Pinterest board weblink for the QR code to link to:

http://www.mobile-barcodes.com/qr-code-generator/

Follow the instructions to generate your QR code to add to your education pack (users can then link to your Pinterest page)