Science Lessons on Dissolving with an EAL Focus and cross curricular links.

QCA unit 6c

Investigate an aspect of dissolving and present results in a suitable graph explaining what the results show
Present results in a line graph where appropriate and explain why it is important to repeat measurements

- To turn ideas about helping solids dissolve more quickly into a form that can be investigated and decide how to carry out a fair test
- To decide what apparatus to use and to make careful observations and measurements
- To make comparisons and draw conclusions
- To use a line graph to present results

Contents for teacher

QCA outcomes

- Identify a range of factors which might affect how fast solids dissolve
- Use a fair test to investigate a solution and explain how it was fair
- Describe one or two factors that help a solid dissolve more quickly
- Present results in a bar chart or line graph and explain what the results show e.g. the salt dissolved faster when the water was hotter or the caster sugar dissolved faster than the granulated sugar.
- Curricular links
- Language structures
- Resources
- Activity overview

A pre- teaching collaborative pack.

- To be used with a targeted group of EAL children in guided writing/speaking.
- To secure key science vocabulary and concpts

Contents for students

- Objective
- Context
- Outcome Criteria
- Task Ordered Key visuals and Writing Frames
- A checklist/ assessment form for activities

Brackets show the activity number on the students sheet
Resources are in red

Science-dissolving- Teachers overview

Pre- lesson activities	Resources	Curriculum	Time/place
1: **pre-lesson task-homework Collect bilingual Vocabulary** Send 1-5 key words home with EAL children to translate with their parents.	A classroom Home language Word/Sentence Chart	Homework	Home A week before the lesson
2. Pre teaching concepts and vocabulary a: read a science text to observe the format and familiarize children with the methodology and vocabulary of science b: generate language beyond the comfort zone through a collaborative barrier game. Ask children to give descriptions which help their partner to guess the correct word for a difficult concept without spelling or speaking the word. c: In pairs fill in the missing sections of two charts and use the pictures to generate a sentence describing the molecular differences in water/gas/solids, and the difference between mass and weight. d: In pairs use a labelled picture to answer a set of questions and fill in a puzzle e: show in movement or dance the differences between molecules of water, gas and solids Show what happens to those molecules when heat/energy is added. Show the affect of water on sugar and what happens to the sugar if the water is hotter. 3. **Decide grouping rational** Ability-mentor-friend? Three group roles-reporter-	**Text and barrier/matching games/kinetic activities** a: a non fiction science text b: a divided crossword, each child has their partner's half of a crossword. One child has the half with down clues already filled in and a menu of pictures describing those clues. The other child has the half with across clues and visuals. c: Two activities which divide one concept into three parts, as either word or picture or phrase. Each part has a separate column One of the three columns is full while the other two matching columns are empty and need to be filled from the menu on the next page. d: a labelled picture which provides the answers for a puzzle and inferential questions e :http://hackney.lgfl.net – then click teacher planning tab-then click e-learning context- an animated clip of sugar dissolving planner for dance or movement e.g. fill in a blank chart showing the movement of molecules 1; Role frames; a checklist of Responsibilities/Actions for each role	Guided writing	Class- preceding week 20 min per-day

Brackets show the activity number on the students sheet
Resources are in red

scribe-observer; who observes

Solid/ sugar	water	gas
Moves slowest	Moves faster	Moves fastest
In neat rows close together	random close together	Very random not close together
Move infrequen tly all together	Jumps every-where within a confined space	Spread out moving every where

the working process of group

Teachers copy of the dance planner

Questions that help visualize the different stages of the dance or movement
a: what is the difference between the movement of the molecules in solids and the movement of the molecules in liquids
b; If water and a solid like sugar are added together will that change the movement of their molecules?

d: What will dissolving look like at a molecular level and how can we show it happening?

e: what are the water molecules doing? What are the sugar molecules doing?

f: will there be any difference if the sugars change e.g. cube or caster or powder sugar.

g: if heat is added to the water what do you think will happen to the movement of the sugar and water molecules?

Resource. A/B/C activity cards
Cards will list materials for collection/activities.
A will 1) collect sugars 2) pour water to exact measure line 3) stir
B will 1) collect full jug of coldwater 2) add the sugar to the measured hot water 3) write up the time taken for the sugar to dissolve in the first experiment and sign name.
C will 1) Collect timer/stopwatch and measuring cup/beaker 2) start timer as soon as sugar is added and press stop when sugar is dissolved.
After each activity is finished the cards move to the next person on the left.

Science-Dissolving- Teachers list of activities and resources with language functions and structures

Lesson Activities	**Resources**	**Language-Functions and structures**
1: shared reading of the objective, context and outcome. The teacher will explain the criteria that the children will use to assess their work at the end of each lesson and at the end of the unit of work.	1: the objective, context, outcome are available for shared reading with a cartoon showing the teacher, three weighed sugars, a cup of tea, a kettle, thermometer, a clock and a bell. 2:Unit/lesson plenary self assessment form for pupils	
2: review key words and sentences in English and other home languages(one word will be variable or factor0 in a sentence about the experiment they will make to solve Miss Ahmed's problem A possible listening exercise is to give each child a red card and ask them to raise it when they hear the word in shared reading	1: a large wall chart for home language/English key words 2; Ta to write the child's name on the board	
4; group children into threes Three groups of three for the three variables?	Nine cards with the variable / activity of the group and each child's role	
5;(this is activity one on the pupil activity sheet) Children consider in their groups what they know. What do they need to know?	Cloze procedure questions and a chart to be filled in with what children need to know	**Statement** We know that--- **Classifying** How are these things alike/ similar/different-the sugars are different because
6;(Child activity two)choose variables for a fair test	fair test frame	**Possibility** I could--- If---might **Action** I will
7(3) Choose materials/apparatus and decide on the method for the experiment	A colour chart of materials/apparatus and a sequence frame for activities	**Comparison** Better than **Necessity/Justification** We need—We must _It is important to use a---because **Sequence** First—then—next -finally
8;(4) Make a prediction for the outcome of the experiment	A prediction frame	**Prediction Hypothesis (science term)** I think/believe/expect—might/will/should
9;(5) Collect materials (from different areas of the room) Begin the experiment	Weighed sugars /measured water jugs, beakers and stirring rods, stop watches,	

Brackets show the activity number on the students sheet
Resources are in red

Science-Dissolving- Teachers list of activities and resources with language functions and structures

	thermometers. A TA or adult to boil a jug of water	
10;(6) Results are written up	Result frame for each experiment	**Recount/sequence/ranking/ classifying-** first/fastest- faster than- slowest/ last/ first second/third
11;(7) Results from groups with the same and overlapping variables are shared and written up	Frame and chart to show average	
12;(8) Results are averaged and turned into a bar chart or line graphs		**Generalising**—Sugar dissolves on average at— Taking into account-----
13;(9) Bar charts/line graphs are shared between the groups with different variables. The processes are explained by the reporters in the group		**Explanation** The results show----It is evident from---It is clear that-- **Describing** the graph has ----- **Explaining/hypothesising-** The information we gathered shows that---This shows
14;(10) Bar charts/line graphs are written up as graphs	Blank graph	-
15;(11) Group consider their results and what they mean They decide on a solution for Miss Ahmed's problem and make a hypothesis/speculation about the cause	Solution Frame Hypothesis Frame-	**Explaining** The factors that affect the speed of dissolving are What we found out is— **Conclusion** Therefore we believe the best solution **Belief** it is our belief that— **Hypothesis/speculation-** We think this happened because-------It might be that **Extrapolation-** therefore it should also be true for -- **Testing** we could test this by—It can be proven mathematically that-
17;912)Teacher models writing a letter/report to Miss Ahmed children write up the solution as a letter/report for Miss Ahmed using the vocabulary and phrases from our experiment frames Differentiation for this activity might be for the most able children to improve/extend the letters scientific solutions	Letter /Report Frame	**Advise** Our advice to you is This is----------therefore we suggest-It is clear that-- therefore

Brackets show the activity number on the students sheet
Resources are in red

Science-Dissolving- Teachers list of activities and resources with language functions and structures

Brackets show the activity number on the students sheet
Resources are in red