Example Lesson Plan

**Learning objectives**

|  |  |
| --- | --- |
| **Things I will know…** | **Skills I will develop…** |
| Define a crystal | Practice safe working |
| Describe some uses of crystals | Work collaboratively to gather data |
| Use the terms ‘dissolve’, ‘saturation’ and ‘crystallisation’ correctly | Explain why we repeat experiments |

**Activities**

**Do now –** Introduction to Global Experiment and learning objectives.

Ask where have you seen crystals before? Can you come up with a definition of a crystal?

(please use the provided presentation)

**Starter –** Video clip for The Global Experiment 2014.

Students should answer ‘what is the definition of a crystal?’ to their worksheet.

**Main Activities – (using the student worksheets provided in the instructions)**

1. Teacher introduction to how we make crystals and the terms dissolve and saturated, using Q&A to determine prior knowledge. Introduction of their task for first experiment. (use and perhaps pause the Global Experiment video after Part A)
2. Class practical of saturation experiment. Results brought to ‘results coordinator’ and entered on to a table.
3. Conclusions discussed and written and shared.
4. Comparison to other people’s results – using the website to demonstrate how graphs are useful for this. Add a sentence to their conclusion.
5. Use results to identify an unknown sample.
6. Introduce growing crystals (use the rest of the Global Experiment video)
7. Class practical of preparing the samples for crystal growth. Leave samples in a safe place for one week’s undisturbed crystal growth.

**Plenary -**

* Rate learning against learning objectives using smiley faces.

**Next lesson** **– (one week later)**

1. Recall and recap from the last lesson.
2. Class practical to recover the crystals from the solutions and identify the best single crystal.
3. Match your crystal to the ‘size and shape’ charts supplied in the instructions and record each result.
4. Discuss similarities and differences between the samples.
5. Collect all data and post to the Global Experiment website with the class as a demonstration.

**Resources required**

Computer with internet access and PowerPoint

Projector

Worksheet for each student

***Saturation experiment.*** Can be conducted in a number of ways to suit class and time available. Students could work in pairs and do one substance once, with results for the whole class pooled together into one table. Alternatively, if time permits, students could conduct the experiment with repeats for each substance.

* Safety glasses
* Labelled pots of Table salt, Epsom salts, Potassium nitrate, Potash alum, Sugar
* Beakers/clear cups
* Small measure 40cm3
* Top pan balance
* Teaspoons/spatulas
* Thermometers
* Calculators

***Growing crystals experiment.*** Run parallel samples of each sample as per the instructions document. The crystals will require one week’s growth and so can be analysed on the proceeding class.

* Safety glasses
* Labelled pots of Table salt, Epsom salts, Potassium nitrate, Potash alum, Sugar
* Beakers/clear cups
* Small measure 40cm3
* Teaspoons/spatulas
* Thermometers
* Kettle
* Kitchen paper towel for filtering or filter funnel and paper
* Wooden skewers
* Clothes pegs