

# 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** – Introduce the Global Experiment 2014 and learning objectives.

Ask where have you seen crystals before? Can you come up with a definition of a crystal? (You could use the provided presentation)

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

Students should answer 'what is the definition of a crystal?' on their worksheet.

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

1. Teacher introduction: How do we make crystals using the terms dissolve and saturate. Determine prior knowledge using Q&A and introduce the first experiment. (Perhaps pause the Global Experiment 2014 video after part A).
2. Class practical; Dissolving and saturating your samples. Results brought to 'results coordinator' and entered on to a table.
3. Conclusions discussed, written and shared.
4. Comparison to other people's results – Use the website to demonstrate how graphs are useful for this, students could 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 2014 video).
7. Class practical: Growing crystals of your samples. Leave samples undisturbed for one week's 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

***Dissolving and saturating your samples:*** This 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 40cm<sup>3</sup>
- Top pan balance
- Teaspoons/spatulas
- Thermometers
- Calculators

***Growing crystals of your samples:*** Run parallel sets 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 40cm<sup>3</sup>
- Teaspoons/spatulas
- Thermometers
- Kettle
- Filter papers / kitchen roll / paper towel for filtering
- Wooden skewers
- Clothes pegs

