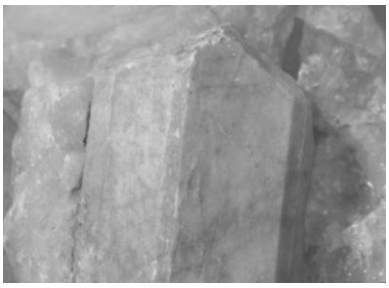
Minerals Form Crystals - Student Activity

Minerals have a regular shape if they have room to crystallise slowly.
Recognising the geometry of the crystal will help us recognise the mineral.

When liquid magma cools, mineral crystals form and rock becomes solid.
How many different mineral crystals can you spot in the granite below?

Answer: _____



This mineral crystal is present in the granite above. Draw an arrow to show where it can be found in the granite.
The darker grey mass is the mineral quartz. Because it was the last to crystallise it had to fill in whatever space was left and could not take up good crystaline form.

We will be making two common mineral crystals, salt and alum. Both are used to preserve food. To do this we will have to dissolve a solute into a solvent to form a solution

What is a solute?_____ e.g. _____

What is a solvent?_____e.g. _____

Fill in the blank spaces in the table below and add an example of your own

Solute	Solvent	Solution
	Milk	Banana milk shake
Coffee grounds Sugar		Coffee
Salt		Seawater/salty water/saline solution
Your example		

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AIM **To create sodium chloride (salt) crystals and observe if they have a regular shape**

Materials per person or group

- 250mL beaker
- Stirring rod
- 50mL hot water
- Dry tea spoon
- Kitchen salt (sodium chloride)
- Half of a Petri dish or saucer

1. Carefully pour about 50mL of hot water into the beaker
2. Add salt to the hot water using the rod to keep the water moving. Wait until the salt has all dissolved before adding more.
3. When the solution will dissolve no more salt, stop. This is a supersaturated solution
4. Pour the super-saturated solution into the Petri dish and set aside to crystallise.
5. Observe the crystals formed and draw three well-formed crystals into the space below. Use a protractor to measure angles. Scientific data is only acceptable if it is observable, measurable and repeatable.

Results

SCALE:_____

Conclusion

_____

_____

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We are now going to change one variable (to make this a fair test).

Aim **<u>To create hydrated potassium aluminium sulphate (alum) crystals and observe if they have a regular shape</u>**

Repeat the experiment but use alum (hydrated potassium aluminium sulphate) as the solute.

Results

SCALE:_____

Compare (how are they the same?) and contrast (how are they different) the two crystals

_____

_____

_____

_____

_____

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Extension for experts

Aim **<u>To create a large alum crystal</u>**

Method

- Dissolve alum as before
- Cover and leave to settle overnight. Crystals will have started to form at the bottom of the beaker
- Decant the clear liquid above into a clean beaker
- Select the largest of the alum crystals lying on the base of the old beaker. This will be your “seed” crystal
- Tie a piece of nylon thread or fishing line to a pop stick or pencil. (Do not use cotton as crystals will grow along this). Tie your seed crystal and let it dangle within the clear liquid in the new beaker. Do not let it touch the bottom or sides of the beaker.
- Leave for a week

If crystals do not grow the solution is too weak. Warm in the microwave and add more alum.

Alum is inexpensive and available from some hardware shops.