Crystals from solutions

You can grow CRYSTALS from solutions. Growing crystals is one way to separate solids from a solution.

In dissolving, a solid seems to disappear into a liquid. But, as we have seen, the solid is still there, only its particles are too small to see. Under special conditions, it is possible to get the solid to come out of the solution again, and at the same time grow into the most beautifully-shaped crystals (Pictures 1 and 2).

Start with a concentrated solution

When you put sugar or salt into water, they dissolve. So how can you get a crystal to grow instead of dissolving? The answer is to begin with a solution that is so **CONCENTRATED** that no more solid will dissolve in it. To remind yourself about how this is done, see pages 8 and 9.

Choose a seed crystal

Once you have a really concentrated solution, you can begin to grow a crystal. Start off with a small crystal of the same substance that you made the solution from. For example, if you have made up a salt solution, then you need to use a small salt crystal, such as a grain of rock salt – these are bigger and easier to handle than grains of table salt. If you are using a sugar solution, then you can use a sugar

▲▼ **(Pictures 1 and 2) The blue crystal above was grown from a tiny seed crystal. The longer the crystals remain in the solution, the larger they will grow – the one below took two weeks to grow.**

grain, a sugar cube or even a piece of sugary, boiled sweet. This will be your seed crystal.

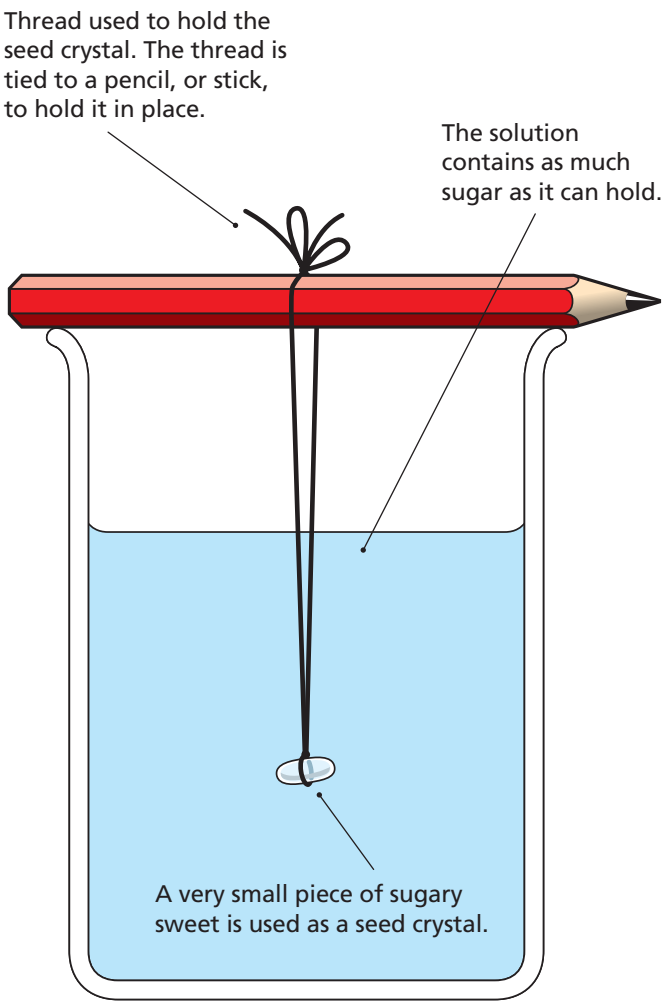
If a crystal is to grow evenly all around, it must be held up in the solution. If you simply put it at the bottom of the jar with the solution, it can only grow upwards and it will have a flat base.

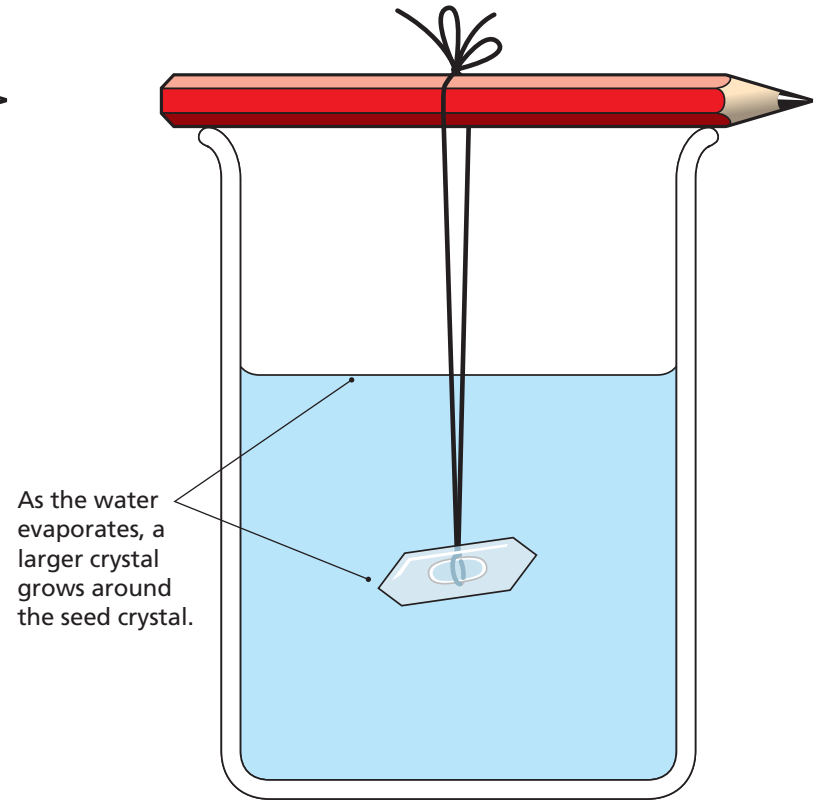
To suspend a crystal, tie a piece of fine cotton thread around the seed crystal and tie the other end around a stick, or pencil, that will fit across the top of the container (Pictures 3 and 4).

Cover the top of the container. You don't want the solution to **EVAPORATE** (turn into gas) while the crystals are growing, or the crystals will be very small.

Now the only thing you need to do is wait. It may take days, or even weeks, for large crystals to form. They will form only if the solution is left completely undisturbed.

▼ (Pictures 3 and 4) Growing large crystals in a concentrated sugar solution.





Summary

- **Growing crystals is one way of separating solids from a solution.**
- **Crystals will only grow in saturated solutions – solutions in which no more of a substance will dissolve.**
- **Crystals grow slowly.**