



Growing Crystals

This activity is quite simple and our kids loved it, but it does take a long time. The crystals need at least 12 hours to grow, without being moved, so it might work better as a holiday club project.

Equipment

Potassium aluminium sulphate powder (alum powder)
Egg shells (real or plastic)
Egg boxes
PVA glue
Paint brushes and marker pens
Water, several bowls
Food colouring (optional)
Microwave

Method

1. Give each child two halves of eggshell and ask them to write their initials on the back with permanent marker.
2. Paint the inside of the shells with PVA, just a thin coat. Paint a little glue around the outside rim of the eggshell too.
3. Using a spoon "sprinkle" the alum powder inside the shell to completely coat it. Turn the shell upside down in the powder to get a coating around the rim too (see photo).
4. Now leave to dry. We turned our egg boxes upside down to sit the powdered eggs in - you don't want them to stick together. We left our eggs to dry for about four hours.
5. Put 500ml of water into a bowl. If you want to, add food colouring, we used about 1tbsp of liquid food colouring per bowl. Heat the water in the microwave to boiling (3-5mins).
6. Meanwhile weigh out approx. 170g of alum powder. When the water has boiled add the powder to the water (watch out for scalding splashes) and stir and stir until the powder has dissolved. This can take quite a long time. If you lift out a spoonful of water and you can still see some crystals in it (see photo), keep stirring. We found that an extra 30 secs in the microwave helped at this point.
7. Once the powder has completely dissolved you can carefully put your eggshells into the liquid. Gently use a spoon to push them under water and make sure they are sitting on the bottom with the open end up (we had a couple which floated upside down and the crystals didn't grow inside). We put 3 or 4 egg shells in each bowl - you don't want too many or the crystals will stick them together.



8. Leave the bowls to cool. We experimented a little at this point. We found that the bowl that cooled the quickest (in the cold dark garage) seemed to start growing crystal sooner. After only two hours we could already see crystals starting to grow.
9. We recommend leaving the crystals untouched for at least 12 hours. If you handle them you might knock some of the crystals off. When you decide the crystals have grown enough, take them out of the liquid and sit them on a paper towel to dry.
10. It is possible to reuse the solution for a second batch. You will see that loads of crystals grow on the bottom of the bowl. Once you've removed the eggs, if you reheat the bowl and stir (even more than the first time) you can re-dissolve the crystals on the bottom. Then you're ready to start again with a new batch of eggs (prepared as per steps 1 to 4 above).

Notes

The crystals grown in the liquid with food colouring were much prettier. The disadvantage is that it's hard to see what is going on inside the bowl because of the food colouring. The clear liquid gives a full view of how the crystals are developing but they are not as attractive. A way round this could be to get the children to paint the insides of their eggs first, then paint with glue (or mix paint into the PVA to reduce drying time). Then you can use all clear liquid.

Time frame: We painted the eggs at about 9.30am. Put them into the bowls of solution about 1pm and we could see crystals growing by about 3pm. We left them until the next morning before we lifted them out to see the crystals. If you did the painting on day 1 and then put the eggs in the solution on the morning of day 2, you could have crystals ready for the end of day two.

The bag of alum powder came with scary health warnings on it, but in fact it is not a strong chemical when used on its own. See here for more info: https://en.wikipedia.org/wiki/Potassium_alum
We bought ours from eBay at £6.79 for 500g (just enough for 3 bowls). They also offer 1kg for £4.50 plus £3.65 p&p. Amazon sell it too, so shop around for the best price.

Areas of learning and development:

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- PSED Personal, social and emotional development
- Math Mathematics
- EAD Expressive arts and design