

NOT FOR COMMERCIAL USE



# Royal Microscopical Society

## Microscope Activity Kit - Teachers Notes

# Activities 1- 3 - Notes

- These tasks can be done at different times
  1. Make a magnifier – how are things magnified
  2. How much can I see? – looking at the field of view
  3. What details can I see? –examining everyday items using the microscope: predicting, exploring, drawing and describing
- It helps if the children can use their eyes first, followed by hand lenses and then the microscope. This helps them relate what they see in the microscope to the real world. Some will struggle to focus the microscope and simply view their own eyelashes or a blurred image. Try getting them to look at their own fingerprints or something large and familiar (a 2p piece is good) to get used to focussing. It does help to have something focussed on the whiteboard to allow them to have an idea of what they are looking for.

# Activity 3 – What details can I see?

- The aim of this activity is to get the children really describing what they see – using WOW words etc. It is otherwise easy for them to get so excited about looking at things that they don't really see anything in focus. It is important to check that the children are focussed on something from time to time as many will exclaim in wonder even when they are not seeing anything. It may help to put the first sample on the whiteboard with the camera so they know what they are looking for.



# Activity 4 – What details can I see?

Suggested themes include:

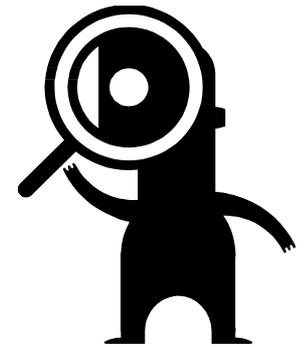
- Baking: sugar (try using different types), flour, oats, biscuit crumbs, chocolate drops etc. Prepare them by either placing in the empty petri dishes provided and sellotaping them shut or by placing a drop of nail polish on a plastic slide and sprinkling same sample on it and allowing to dry
- Materials: Rocks and sand, different types of paper, different types of wool/string/material
- Parts of plants (roots, leaves, petals and other flower parts, seeds (poppy seeds are especially pretty)
- Minibeasts found outside or often there will be dead ones on the windowsill!
- Kitchen items: Coffee, teabags and their contents, chocolate powder, herbs etc
- Pond water (aquatic shops have really good and cheap samples)
- Cells: onion cells are the easiest. Remove the membrane between 2 layers of onion and dye with a drop of food colouring – you should be able to see the individual cells.
- Electronics
- Other items that the children collect

# Activity 5 – Dissolving and reforming crystals

## Teachers notes:

- Have a look at the crystal structure of sugar (you can extend this by using different types of sugar), salt and other non crystalline things like chocolate powder and instant coffee granules. Draw and describe how they look under the microscope.
- Dissolve the crystals/granules/powders above in water-explore the usual parameters-how much you put in, the temperature of the water, whether it is stirred etc. It helps at this point to add a drop of food colouring to the solutions containing crystals.
- Using the microscope you can see the crystals losing their structure in the liquid (put plenty of salt/sugar in and use only a small amount of liquid in a petri dish for best results).
- Leave the sample overnight for the water to evaporate. The next day the water has mostly evaporated and the crystals have reformed! The powders/granules will remain dissolved.
- If you want to, this makes a good experiment for time lapse video microscopy using the camera

# Activity 6 – Super- sleuth



## Teachers notes:

- This activity is designed to build on the investigations the children have already carried out. A series of written clues and samples to explore in the microscope allow them to narrow the field of suspects from 4. We have provided samples in petri dishes to keep a number of samples clean-but there are others in the pack that can be used so the children can describe the texture and other properties. If you can supply suggestions for other clues we would be delighted.
- The final clue is a jelly baby from the crime scene. The verbal clues point to a persons association with sugar, sand, herbs and flour and samples of these are included for comparison. Loose samples of each are also provided. You need to push some of one sample into the jelly baby to collar the criminal. Each table could have a different outcome for their jelly baby, and it doesn't have to be the ones with the most ticks either-it's up to you.
- In some cases the differences between the samples are quite tricky to spot. They will need to describe what they see and try to debate the differences. Using the hand lenses and then the microscope is a way of magnifying the samples gradually.

- The 'newspaper' is from the Argos catalogue and the Boden catalogue. One has a high proportion of black fibres in the paper and appears quite rough. The other has a set of printed yellow dots all over.
- The tissues are a single ply from a normal tissue and a piece of lens tissue (used to keep lenses clean). It will be easy to spot the difference-they both have an open mesh structure similar to a tea bag. If they are placed under the microscope together it can easily be seen that one is much more open than the other. The difference is striking when viewed on a dark background (as demonstrated in the online videos).The children can discuss and debate which they think it is-and if they get stuck , compare the two.
- The fingerprints are best explored with the hand lenses. The 'clues' are magnified features which can be seen on at least 2 of the suspects prints. Some are bulb shapes and some are squashed triangular shapes.
- Make sure you provide each group with a set of samples and one clue only
- The aim of this game is not to necessarily get it right - but to deduce and discuss the options. In the end it is the jelly baby clue that gives the game away. Any one of the suspects could be the criminal up to this point. This means that you can decide to make the culprit different for each table for example; or you may chose to reward a table who are working well and make their suspect the culprit. If the culprit is not who the children think it is, they can have fun reasoning how.