3. Making foam

1.5 hours

Children develop a method for producing and measuring foam, whilst learning that formulation scientists choose ingredients because of their specific properties. They go on to mimic methods used by these scientists to make and test their own bubble bath recipe.

OBJECTIVES

- To plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- To report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations

RESOURCES

(Per group of 4 children unless otherwise stated)

- Activity sheets 3-5
- Bowl
- 2 litre pop bottle
- 20 ml Creamy foam bath Pipette/syringe
- 100 ml measuring cylinder Drinking straw
- Spoon
- Whisk
- Bucket of water (for rinsing between tests)

INTRODUCING THE ACTIVITY

Use the website area Fun with Foam - A Frothy Question The online activity provides the starting point for this lesson. The children are asked if they can define foam, describe where they see it, and when it might be useful. The children discuss ideas, first with a thinking partner, and then with their group. The teacher gathers ideas from the groups. Returning to the web page, images of foaming products, such as soap or shaving foam are displayed. The children are asked to take the Foam Challenge, by finding different ways of making and measuring foam.[1]

1 If accessing the internet is not possible, the teacher may use Activity sheets 3-5 to introduce and support challenges 3-6 to the children. A demonstration by the teacher of foaming, using shaving foam or soap, could also enhance this lesson.

ACTIVITY

The teacher explains that the children are to first devise a method for producing and measuring foam using a standard measure of soap to water (e.g. 1 ml creamy foam bath to 300 ml water). Each group is to discuss and test ideas for making foam, which may include blowing through a straw, stirring, whisking, beating or shaking. They decide what to measure and how to record their results. A pipette or syringe could be used to add the soap to water. One method the children may try is to mark graduations of 100 ml up the side of a 2 litre pop bottle. The bath foam and 300 ml of water are added, the lid tightened and the bottle shaken vigorously. Ten shakes produces fairly reproducible foam although other methods also work. The children decide which method is most effective at producing foam and which can be replicated to produce similar volumes of foam each time.

According to their ability, the children could extend their investigation to discover whether there is a link between the volume of water used and the amount of foam produced.

PLENARY

The groups share their results with the class. One way of doing this is to ask a member of each group to be the envoy, answering questions and explaining their method to the other groups. An explanation of envoying and other discussion techniques may be found in Appendix 2.

A class set of results, such as a bar chart showing method versus volume of foam, could be collected and displayed on the whiteboard. Groups investigating volume of water used and amount of foam produced may record their data in the form of line graphs providing further opportunities for analysis of data and drawing conclusions.

Returning to the website, the children have the opportunity to interact with the website by inserting their methods of making and measuring foam, and consider:

Which methods were most successful and why?

How did they measure the amount of foam?

Could they repeat their results?

AMBASSADOR ROLE

The ambassador may initiate these activities and act as an advisor/consultant if present for the practical sessions. The ambassador may also play the part of a judge and provide detailed information for the latter stages of the activities, such as marketing aspects. Ambassadors could also explain the difficulties encountered on the plant by excessive foam production, leading to blockage in pipelines or affecting movement of product or ingredients from one vessel to another. They could explain the measures taken by engineers to overcome these problems.

> *Perfect for Year 5. Very good ideas to draw children in; all enjoyed and gave very positive feedback. The resource notes are very thorough and ensured that each step was easy to carry out. The resource is creative and uses literacy and other core subjects to engage the children. It is appealing to many types of learner.*
> *(Year 5 teacher, Widness)*

Appendix 1

Role Badges

All of the classroom sessions involve children working together in groups of four.

Each child is responsible for a different job or role within the group and wears a badge to identify this. The images below may be photocopied onto card and made into badges, by slipping them in to plastic badge sleeves. Keep sets of badges in 'group' wallets, to be used on a regular basis in your other science lessons.

Children should be encouraged to swap badges in subsequent lessons; this will enable every child to experience the responsibilities of each role.

Administrator keeps a written and pictorial record for the group

Resource Manager collects, sets up and returns all equipment used by the group

Communications Officer collects the group's ideas and reports back to the rest of the class.

Health and Safety Manager takes responsibility for the safety of the group, making sure everyone is working sensibly with the equipment.

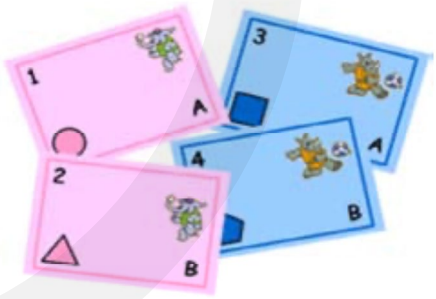
Where groups of 5 are necessary, the following role can be used:

Personnel Manager takes responsibility for resolving disputes within the group and ensuring the team works cooperatively

Appendix 2

Discussion strategies

The following strategies are used extensively as part of the Discussions in Primary Science (DiPS)[1] project, and have been proven to be successful when developing children's independent thinking and discussion skills.



Talk cards

Talk cards support the teacher in facilitating these discussions, with the letters, numbers, pictures and shapes enabling the teacher to group children in a variety of ways.

The example provided here shows one set for use with four children. The set is copied onto a different colour of card and talk groups are formed by children joining with others who have the same coloured card.

Children can then pair up by finding a partner with the same animal or a different letter eg. elephant, rhino or a + b pair. Each TALK pair would then have a card with a different number or shape.

The numbers or shapes may then similarly be used to form alternative groupings and pairings.

Note: The example talk cards are provided in MS Word format so you may make changes if you wish.

ITT (Individual Think Time)

Each child is given time to think about the task individually before moving into paired or group work.

Talk Partners

Each child has a partner with whom she/he can share ideas and express opinions or plan. This increases confidence and is particularly useful where children have had little experience of talk in groups.

A > B Talk

Children take turns to speak in their pair in a more structured way, e.g. A speaks while B listens B then responds. B then speaks to A while A listens and then A responds to B.

Snowballing

Pupils first talk in pairs to develop initial ideas. Pairs double up to fours to build on ideas. Fours double up to tell another group about their group's ideas.

1 For more information go to www.azteachscience.co.uk

Envoying

Once the group have completed the task, individuals from each group are elected as 'envoys', moving on to a new group in order to summarise and explain their group's ideas.

Jigsawing

Assign different numbers, signs or symbols to each child in a group. Reform groups with similar signs, symbols or numbers, e.g. all reds, all 3s, all rabbits and so on. Assign each group with a different task or investigation. Reassemble (jigsaw) the original groups so that each one contains someone who has knowledge from one of the tasks. Discuss to share and collate outcomes.