6. Developing a bubble bath recipe

2-3 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 compare and group together everyday materials on the basis of their properties
- To give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials
- To model methods used by scientists to make and test their own bubble bath recipe

RESOURCES

(Per group of 4 children unless otherwise stated)

- Creamy bath foam (e.g. supermarket brand) 150 ml clear shower gel
- Cup of corn flour
- Cup of salt
- Cup of hair gel
- Food colouring
- Pipette or syringe
- 5ml fragranced oil (e.g. Body Shop or similar) 50 ml sunflower oil
- Measuring cylinder Teaspoon

ADVANCE PREPARATION

Mix 150 ml clear shower gel with 100 ml water to produce a thin clear gel solution. This is to be the 'bubble making ingredient' in the bubble bath. Thickeners should be labelled as in previous activity. Label the sunflower oil as 'moisturising oil'.

INTRODUCING THE ACTIVITY

Use the website area *Fun with Foam - A Recipe for Success*. The email on this page explains that the scientists at Sumptuous Skincare Ltd are working hard on their recipe for bubble bath and they would like the children's help. The teacher shows the children a commercially available bubble bath which is thick, has a creamy appearance and is coloured and fragranced. The company scientists have asked the children to use the ingredients provided to design a bubble bath that will have similar qualities and will appeal to their customers. They should use the information they have discovered from their other investigations to help them.

ACTIVITY

The children are supplied with all the ingredients. The teacher should explain that the moisturising oil helps to soften the skin and helps to prevent it becoming too dry. They should recall from the results of previous experiments that salt will give the best thickening performance maintaining a clear mixture but only if added in small amounts. They will discover that adding vegetable oil will give a creamy appearance; the colour and fragrance produce the other more aesthetic properties. They should be able to justify their choice of ingredient type and quantity, based on previous findings. They may also test the foaming of their own formulations and use the data to produce a marketing sheet. It may be useful for the groups to plan and explain to the teacher the method they will use before proceeding.

PLENARY

The Communications Manager from each group describes their recipes to the class. Recipes are compared and similarities and differences discussed. Returning to the website, the children are encouraged to design and make a poster to inform customers about the quality of their bubble bath. The web page area Marketing the Mixture provides ideas to support the children in this process.

Each group produces a marketing sheet displaying the key features of the particular formulation. Recipes could be tested by other classes or groups and compared with the claims made on the marketing posters.

EXTENSION ACTIVITY

An e-mail sent to the children after the experiments (Activity sheet 4), together with a sample formulation recipe from Sumptuous Skincare Ltd (Activity sheet 5) giving details of the ingredients used in the test sample, explains that too much oil may have been added. The children are asked to do further investigations to improve the sample recipe by reducing the volume of oil used, eventually producing their ideal bubble bath.

INFORMATION FOR TEACHERS

Ingredients when mixed using a recipe or 'formula' produce a 'formulation'. Some of these ingredients may give the formulation specific properties, producing effects which cannot be made by ingredients when they are used singly. The explanation for adding oil (i.e. sunflower oil) to the formulations is that this can reduce the irritation sometimes caused by other ingredients (foaming ingredients) and it also moisturises and softens the skin. In this case, it also gives the formulation a creamy appearance. It should be apparent at this stage that the addition of too much oil is detrimental to the foaming properties of the recipe.

AMBASSADOR ROLE

Ambassadors from industry could participate in the development of the bubble bath, providing support as an advisor or consultant. They may be able to supply a selection of fragrances for the children to use. If marketing leaflets are designed, these could be presented to the ambassador for feedback and a discussion around the claims and formulation can take place. The presentations and marketing sheets could also be taken away by the ambassador and judged. The ambassador could bring marketing materials in various stages of development, to demonstrate and discuss the processes involved.

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.

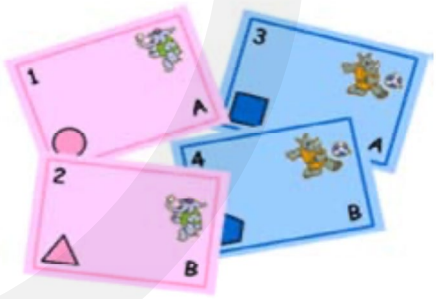
Where groups of 5 are necessary, the following role can be used:

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.