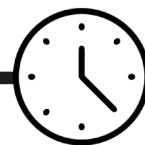


## 4. Comparing bath foams



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

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- To plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- To take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- 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

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(Per group of 4 children unless otherwise stated)

- 1-3 creamy bath foams (e.g. supermarket & branded) Sumptuous Skincare Ltd 'test product'
- Pipette
- 2 litre pop bottle marked in 100 ml
- 100 ml transparent tubes or measuring cylinders Stop clock

### ADVANCE PREPARATION

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In a plastic bottle labelled 'A' or 'test product', add 50 ml of clear shower gel (e.g. Simple shower gel) to 50 ml sunflower oil and mix gently to minimise air bubbles and foaming.

### INTRODUCING THE ACTIVITY

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Use the website area *Fun with Foam - Comparison Test*. This web page introduces the next activity. Scientists at Sumptuous Skincare Ltd have sent the children a sample of their new bubble bath. They would like the children to use a method of foam production to test the sample and one or more known brands of creamy bath foam. They should compare the quality of foam by considering the amount of foam produced and how long it lasts. They are to report their results to the company.

## ACTIVITY

Using the method of foam production previously researched, the children choose the measurements to take and the method of recording their results, e.g. photographs or a table. A typical result adding 1 ml creamy foam bath to 300 ml water using the 'shake in a bottle' method is shown in the table below:

Sample	Foam Height Achieved <sup>1</sup> after 10 shakes
Supermarket Creamy Bath foam	550 ml
Test Product (Simple shower gel with sunflower oil)	390 ml

Measuring cylinders or seal-able plastic tubes may be substituted for pop bottles. In this case, the volume of water would need to be adjusted to suit the container, but the same 'shake' method is effective. Typical results using a supermarket 'basic' range creamy foam bath are shown below:

Foam bath (ml)	Water (ml)	Foam height (ml)	Volume of foam (ml)
0.5	20	70	50
0.5	30	80	50
0.5	40	90	50
1	20	80	60
1	30	95	65
1	40	100	60
<b>Foam bath plus oil</b>			
1	20	50	30
1	40	75	35

The children should be encouraged to display the data collected in the most appropriate way. Measuring the amount of foam against time the foam lasts would enable a line graph to be produced and the more able could be challenged to make predictions using extrapolation.

<sup>1</sup> This includes the layer of water. The children may choose to measure the foam only.

## PLENARY

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The children are asked to describe the method they used for measuring the foam, and the following questions may be posed:

*What do the results show?*

*Were there any unusual measurements?*

*Did the groups draw similar conclusions?*

*Would you recommend the test recipe?*

*What advice would you give to the company scientists?*

Returning to the website area Comparison test, the children are invited to respond to the company by considering whether their tests were fair and which sample produced a good, long-lasting foam.

## INFORMATION FOR TEACHERS

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The addition of oil reduces the foaming ability of the product and hence the shower gel with oil should foam less. By adding oil, such as sunflower oil, to a clear liquid, the appearance will change from clear to opaque/creamy. It is compared to a creamy foam bath in order to make the two test products look similar.

## AMBASSADOR ROLE

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An ambassador may be present during the investigations and provide industrial support for the activities, acting as an advisor/consultant. They may assist in the planning and help with problem solving. They could also bring samples of a variety of anti-foaming agents used in industry, such as oils or powders, or photographs of the effects of adding such agents.

# 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:

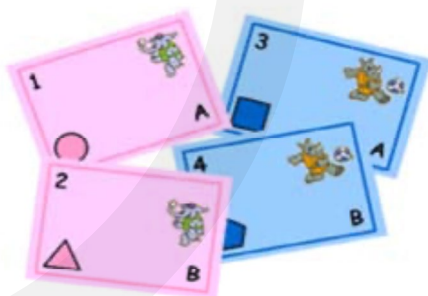
**Personnel Manager** takes responsibility for resolving disputes within the group and ensuring the team works cooperatively



## Appendix 2

### Discussion strategies

The following strategies are used extensively as part of the Discussions in Primary Science (DiPS)<sup>1</sup> 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.

<sup>1</sup> For more information go to [www.azteachscience.co.uk](http://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.