

5. Creating a coating

1 1/2
hours

The final activity looks at planning and carrying out a fair test to delay dissolving in the mouth.

OBJECTIVES

- Demonstrate that dissolving, mixing and changes of state are reversible changes.
- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.

RESOURCES

(Per group of 4 children, unless otherwise stated)

- Activity sheet 11
- 5 Alka-Seltzer® tablets
- Vegetable oil (approx. 50 ml)
- Chocolate button
- Sugar coated chocolate button
- Disposable/protective gloves
- 1 teaspoon of three of the following materials: icing sugar, PVA glue, honey, flour, sugar syrup, poster paint.

INTRODUCING THE ACTIVITY

Show the class an urgent memo from a second medicine company department (Pets Paws plc) explaining that they have found a problem with the tablet (Activity sheet 11). After tests they have found that the tablets are fizzing in the dogs' mouths instead of in the dogs' stomachs. Drop an Alka-Seltzer® tablet into some water to show what happens, and ask the children to describe what they see; it fizzes as soon as it touches the water. Explain that the tablet is both dissolving and changing when it mixes with the water, and that a gas is made, which is the 'fizz'. (This change is irreversible, due to the nature of the chemical change and the production of carbon dioxide.)

The children discuss the problem and come up with suggestions of how to delay the fizzing of the tablet until it gets into a dog's stomach. A mind-map of their responses can be created.

Place a chocolate button in one hand and a sugar coated chocolate in the other. Ask the children which they think will melt first? Ask them what slows the melting of the sugar coated chocolate? Explain that it has a coating over the chocolate.

Safety note

Children should not eat the chocolate, but wash it off their hands on completion of the activity.

MAIN ACTIVITY

Explain that the children are going to test different materials to find out which one would provide the most suitable coating to delay the fizzing until it reached the dog's stomach. Discuss the investigation question:

- *Which material would be best for coating the tablet to slow down the dissolving?*

Ask the class what variable they would change, e.g. coating, and how they would measure it (e.g. by timing how long it takes to start fizzing when placed in water). This could be done using Post-it planning, by those teachers familiar with this method. Examples are available on the CIEC web site.

Provide the children with three Alka-Seltzer© tablets, some vegetable oil and some materials for coatings, e.g. icing sugar, PVA glue, paint etc. Because many of these coatings are water based, the tablets need to be coated in vegetable oil first to provide a temporary coating and then quickly coated in the chosen material. Demonstrate first by dipping an Alka-Seltzer© in vegetable oil and then coating it by dipping in one of the other materials. The tablets should ideally be left overnight for the coatings to dry. Ask a child to start the stopwatch as soon as it touches the water and to stop as soon as it starts to fizz.

This activity can be fiddly for the children to carry out and may lead to different groups getting different results. It can be difficult to ensure that the tablet is completely covered in vegetable oil before you add the other coating. It is also difficult to create an even layer of each coating. The vegetable oil alone is not enough because it will rub off onto hands and the packaging. Once again coatings such as PVA glue and poster paint are used to discover the properties of a material that will be suitable. Obviously these could not be used because they are inedible. However, the investigation will give children an idea of the processes and difficulties involved in trialling different ideas in order to solve a problem and will provide plenty of scope for evaluation in the plenary.

The children plan and carry out a test to investigate the time it takes before the first fizz.

PLENARY

Discuss findings and then report back to the company (by replying to the memo) regarding which coating works the best to delay the tablet from fizzing. Tell the children that tablets often have a sugar coating that stays intact until it reaches the stomach and helps the medicine to taste nice.

Ask the children to evaluate the investigation by highlighting the things that went well, what went badly and how they would improve it next time.