Apple browning

Atul only wanted half an apple, so his Granny put the other half in a cup of water. "Why did you do that, Granny?" asked Atul. "To stop the apple going brown, of course" replied Granny. "Is that the best way of stopping it going brown?" said Atul. "Let's find out, shall we?" said Granny. "We can try lots of different things from the kitchen."

- Your task

What do you think Atul and his Granny should do?

Based on a suggestion by P. Borrows.

Time

60 minutes.

Group size

2–4.

Equipment & materials

Eye protection.

General
Yoghurt pots. Aluminium foil – students may think light causes browning. Kettle.

Apples.

Salt, sugar, vinegar, lemon juice, bicarbonate of soda. Access to water.

Health & Safety notes

This is an open-ended problem solving activity, so the guidance given here is necessarily incomplete. Teachers need to be particularly vigilant, and a higher degree of supervision is needed than in activities which have more closed outcomes. Students must be encouraged to take a responsible attitude towards safety, both their own and that of others. In planning an activity students should always include safety as a factor to be considered. Plans should be checked by the teacher before implementing them.

You must always comply with your employer's procedures and in some cases may decide that a particular activity is inappropriate in your situation. Further information on Health and Safety should be obtained from reputable sources such as CLEAPSS [*http://science.cleapss.org.uk/*] in England, Wales and Northern Ireland and, in Scotland, SSERC [*https://www.sserc.org.uk/*].

Consider the safety aspects of eating in the lab.

It is the responsibility of the teacher to carry out a suitable risk assessment.

Curriculum links

Chemical preservatives. (Biological oxidation.)

Possible approaches

Questions to ask students who need help are:- Do they need to use a whole apple each time, or can they use tiny slices? Would it be best to cut the apple up first, or to get everything else ready first? Is cold water better than warm water? Apart from water, what else might you safely try? *(eg* salty water,

sugary water, vinegar, lemonade, bicarbonate of soda, anything else?) How can you make your tests fair?

Each group could make a presentation to the class of their findings. At the end of each talk encourage 'members of the audience' to ask the speakers any questions, as one might do at any scientific meeting.

As envisaged, the experiment is of low hazard and eye protection will not be needed. If any hazardous substances are chosen, their use should be risk assessed.

Extension work

Why is lemon or orange juice squeezed over a fruit salad containing apples, pears or bananas? Find out about the preservatives in your favourite food.

Credits

Health & safety checked May 2018

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