

Salty crisps

Kin Yu's mum has high blood pressure. Her doctor has told her to cut down on the amount of salt she eats.

- Your task

Which sort of crisps would be best for her?

Based on a suggestion by I. Carpenter.

Time

120 minutes.

Group size

2–4.

Equipment & materials

Eye protection.

General

For 11–16 years: filter funnels, filter papers, glass beakers, wash bottles, glass stirring rods, evaporating dishes. Bunsen burners, tripods, gauzes, heat-resistant mats, clampstands. Access to balances. Writing and/or display materials (sugar paper, felt tip pens *etc*) are also required.

Binocular microscope (x 50 magnification).

Access to water.

Per group

1 packet of each of 3 different brands of ready salted crisps.

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>].

The taste test should be conducted outside of the laboratory and not after any contact with chemical solutions.

Eye protection should be worn.

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

Curriculum links

Dissolving, filtration, evaporation. Healthy eating.

Possible approaches

Most 7–11 year olds will probably go for a taste test. Questions to ask students who need further help:- How can they make it fair? Does it matter if your mouth is already salty? Does it matter if the crisps are different sizes? Does it have to be a taste test? Could they wash the salt off and compare it? (One unexpected method adopted by a number of students in the 7–11 age range was to ask for a binocular microscope ($\times 50$ magnification) and count the salt grains!)

11-16 year old students tended to wash the salt off the crisps with cold water (messy! other things dissolve as well) and collected the dissolved salt. Students could then evaporate the salt solution to dryness and weigh the salt residue, or use a hydrometer to measure how salty the water is. Alternatively, conductivity may be used.

Suggested write-up

Students to write a letter telling Kin Yu's mum which sorts of crisps would be best for her and how they arrived at their answer. Also a suitable poster could be produced (class effort) that might be put on display in the local health centre. Or students might produce a 'Health Education' video.

Evaluation of solution

Each group should put the crisps in order of decreasing saltiness. Older students should tackle the experiment more quantitatively.

Credit could be awarded for:

- 1 The correct order.
- 2 The quality of write-up.
- 3 The elegance of the approach.

Extension work

Students could find out what other foods should not be eaten if you have 'high' blood pressure. Students could also test for presence of starch in crisps. Comparison of salted peanuts.

Credits

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Health & safety checked May 2018

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