Crisps

Pupil Sheets

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Half of UK children "drink" almost five litres of cooking oil every year as a result of their pack-a-day crisp habit, experts warn.

- In groups discuss the headline above.
- What is the average number of bags of crisps eaten by members of your group?
- How does the information in the headline make you feel?

The Task

The aim of this investigation is to find out more about the fat content of crisps

The stages of the project are

1. Research fat in crisps
2. Design the investigation
3. Carry out your planned investigation
4. Prepare a presentation that will be given to the class

The Research

Include in your research answers to the following questions

- What is the main type of fat in crisps?
- Why is the fat in crisps bad for you?
- What is good and bad fat?
- How much fat is too much fat?
- What harm can too much fat do?
- What foods are high in saturated fats?
- What is the Recommended Daily Allowance (RDA) of fat?

Exploring Solubility

Equipment

- Test tube rack
- 4 test tubes
- Spatula
- Fat and oil samples to be tested
- Solvents: Ethanol / Propanone / Petroleum ether (40-60°C) / Water

Health and Safety

- Wear safety goggles.
- The solvents are flammable so must not be used near a flame.
- Do not dispose of solvents down the sink.

Method

1. Copy the table shown below into your lab book.

Fat / Solvent	Propanone	Ethanol	Petroleum Ether	Water
Butter				
Sunflower oil				
Olive oil				
Lard				

2. Place a small amount of each of the fat or oil samples into one of the four test tubes.
3. Add a small volume of propanone to each sample.
4. Gently wiggle the test tube and note down the solubility using a ✓ or a ✗ in the table.
5. Repeat with the other solvents.
6. Write down a conclusion for the experiment.

Designing your investigation

Your teacher will demonstrate a technique to extract fat from crisps.
In your group discuss the following points:

What are you going to investigate?

- Do different flavours have different quantities of fat?
- Are cheap crisps higher in fat than expensive crisps?
- Are baked crisps really better for you?
- Are low fat crisps really low in fat?
- Which solvent is best for extracting fat from crisps?

There are many other possibilities – be inventive.

You will also need to consider how to make the investigation fair and reliable

What do the underlined words mean?

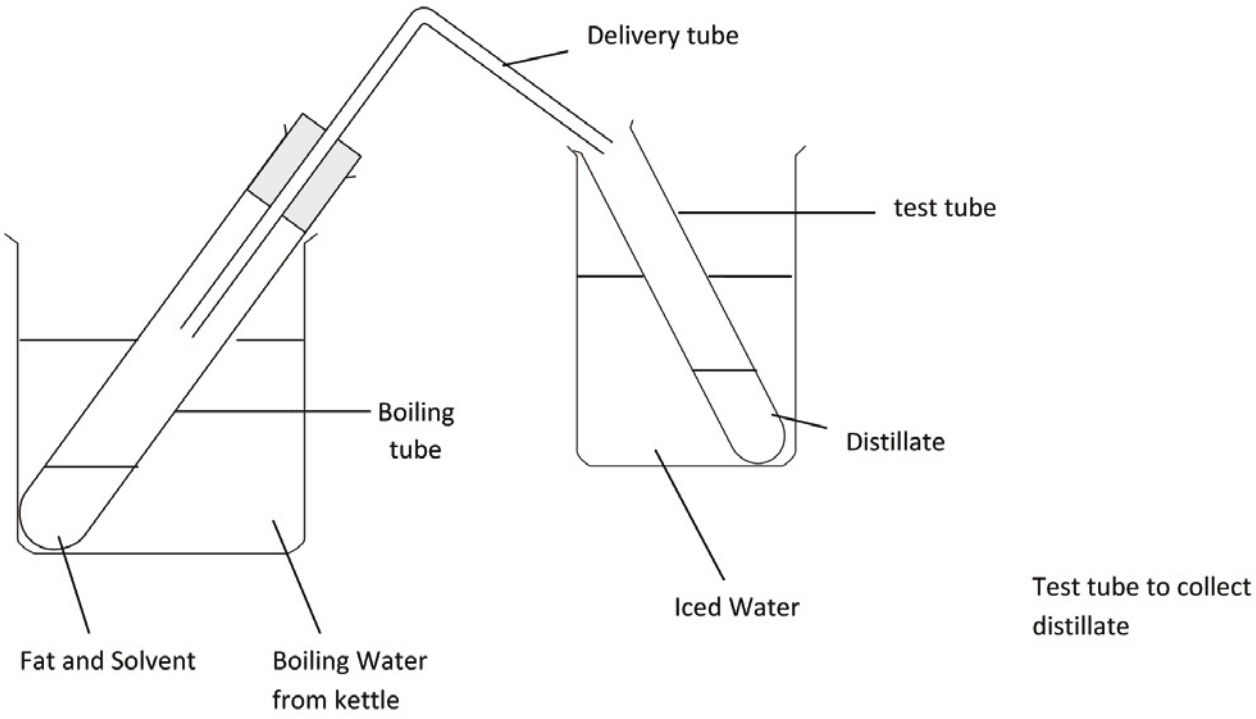
What will need to be measured during your investigation?

All measurements will need to be recorded in your lab book.

Carrying out the investigation

Safety glasses must be worn

1. Crushed crisps are placed in a test tube and a solvent added. A stopper is placed on the test tube and the mixture is shaken, gently to begin with.
2. Remove the stopper to release any pressure then replace and continue shaking.
3. Filter the mixture carefully through glass wool. Ideally the filtrate should be collected in a boiling tube.
4. As directed by your teacher, set up the equipment for distilling the solvent as shown below.
5. Carefully distil the solvent until no more is removed.



6. Pour the remaining fat and solvent mixture into a weighed crystallising dish and place on the hot plate to remove the last traces of solvent.
7. Allow to cool, and then reweigh.

The presentation

The presentation can take many different formats. Examples include power point presentations and scientific posters.

You should include:

- The answers to your research questions
- What you chose to investigate
- Your results
- Any problems you encountered
- Your conclusion (is the headline correct?)
- What you learned about chemistry
- What you learned about crisps
- Whether this investigation changed your view on eating crisps

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