

Popcorn - a fat free snack

Developers: Rely Shore

Institute: Weizmann Institute of Science

Country: Israel

Subject: Chemistry, Science for all

Grade level: 9-12 grades

Curriculum content: State of matter

Kind of activity: Inquiry experiment

Anticipated time: 4-5 hours (2 hours for the first phase, 2-3 hours for the second phase)

Task description:

This activity combines a well known cooking activity (preparing popcorn) with an inquiry process. Usually the popcorn we eat is made with butter or oil. In this activity we will check whether the use of fats is really needed in order to prepare popcorn.

General Instructions:

- **Read** carefully all the guidelines before starting the experiment.
- **Check** that you have all the equipment and the materials that are required for the experiment

Equipment and Materials:

Electric hot plate **or** Bunsen burner

Cooking pot with a glass cover

1 spoon of oil

A Handful of popcorn

Phase A: The Course of the Experiment

Make sure that you:

- **Follow** precisely the **instructions** for executing phase A.
- **Collect** as many **observations** as possible.
- Use clear and organized **reporting** regarding the **observations**.
- **Include** all the group's members in conducting the various tasks.
- Use appropriate and accurate **scientific language** throughout the process.

Put the oil and the popcorn into the cooking pot.

Cover the pot.

Heat the pot.

Watch and write your observations (use all your senses).

Phase B: The steps of the inquiry

I.

1. **Formulate** 5 varied, relevant questions that arose following the observations that were made.
 - **Choose** one of these questions that you would like to investigate.
 - **Formulate** this question clearly as an inquiry question, and to the extent possible, as a link between two variables.
 - **Clearly formulate** an **hypothesis** that relates to the question that you chose to investigate.
 - **Give reasons** for your hypothesis, based on correct and relevant scientific knowledge.
2. **Plan** an experiment that will check the validity of your hypothesis.
 - **Detail** all the steps of the experiment, including the control stage.
 - **List** the equipment and materials needed on the equipment request form.
 - **Consult** with the teacher and make changes if necessary.
 - **Submit** the list of equipment and materials to the laboratory technician.

II.

3. **Get the teacher's approval for the proposed experiment.**

- Carry out the experiment you proposed after approval by the teacher.
- **Present** the observations and the results in an organized form (table, diagram, graph, etc.).
- **Analyze and interpret** the results
- **Examine** the connection between the inquiry question and the conclusions.

4. In the summarizing group discussion

- **Express your opinion** about all the stages of the inquiry (limitations, precision, etc.).
- To the extent necessary, **point out** the changes desirable in the inquiry process.
- **List** additional questions that arose following the whole process.
- **Prepare** your group's summary of the experiment for **presentation** before the class.

5. In the summarizing class discussion

- **Relate** to our experiment considering the reports of all the other work groups.

6. **Ensure** that the report is well organized, aesthetic, and readable.

Enjoy the work!