

# Edible Chemistry: Food for Thought

## Development & Implementation of two PROFILES modules in Israel

### Dark, Milk or White – Which Tastes Better?

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### Oil of Life: Is Olive Oil the best oil?

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### Abstract

Have you ever thought about questions such as: How is chocolate made? What kind of chocolate is the best?

In this module, the students enter the magical world of chocolate. They prepare chocolate, and decide which kind tastes best, while identifying their criteria which helped them make a decision. The module includes activities designed to allow the students to find out different aspects of the product known as chocolate - the production process, kinds, composition, and other interesting facts.

Olive oil has been recognized for many years as healthy. It is often referred to as: "Liquid Gold"- due to its nutritional value. In Israel, as in Mediterranean countries, olive oil is part of the daily diet, but is used also to produce cosmetics, natural medicine and to lighten our lives.

The module deals with questions such as: What do people know about olive oil? Which criteria should we consider when choosing salad dressing oil?

The module was integrated into the learning curricula related to "chemicals in human nutrition". A sequence of activities leads the students to make scientific based decisions.

### Goals & Implementation

	dark milk or white	Olive oil
<b>Social and Educational Goal</b>	Creating awareness to the nutritional values of chocolate.	Creating awareness to the nutritional value of olive oil and to people believes by performing a survey
<b>Cocepts to be learned during class</b>	Chocolate, the chocolate's composition, melting and freezing temperatures, states of matter, colloid mixtures.	Olive Oil – nutritional value and components that make it healthy. Determination of free fatty acids percentage.
<b>Skills</b>	Planning and conducting a scientific experiment; Locating data online, and compiling data from several sources; Developing presentation skills; Decision making.	Asking questions, literature and web search, executing an open ended Inquiry experiment, decision making peer learning and cooperation.
<b>Estimated lesson time</b>	Four academic hours, plus homework.	Eight lessons
<b>Target population</b>	10th grade chemistry or biology students	9th grade students.



### Contents of the Activities

**Introduction** - A video about the preparation of chocolate followed by a demonstration of the chocolate preparation in class.

**Experiment Planning** -The students choose one question regarding chocolate preparation and phrase it as a research question.

**Expanding Our Knowledge** – The students choose a topic regarding chocolate and find relevant information in the Web.

**Presenting Our Knowledge** - The students prepare a creative and interesting presentation in which they enrich and share their acquired knowledge on chocolate with the class.

**Conducting the Experiment** - The students prepare their own chocolate according to their earlier research question.

**Making Decisions** – The students perform taste tests and decide which is their favorite chocolate.

**Final Stage** - A video about the production of chocolate and personal reflection.



Chocolate Survey

**Introduction** – Survey to reveal existing knowledge - In the first activity students gather information regarding the type of oils used in their homes by using the following survey linked to the QR.

**Laboratory experiment** - Students determine the percentage of free fatty acids in olive oil, which is one of the criteria of the quality of oil, and verify the information on the nutritional labels.

**Critical reading and viewing**- Students perform a critical comparison between two articles, and two YouTube videos dealing with olive oil.

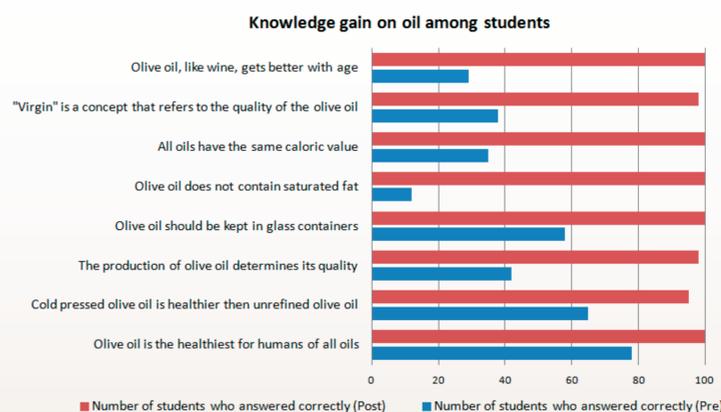
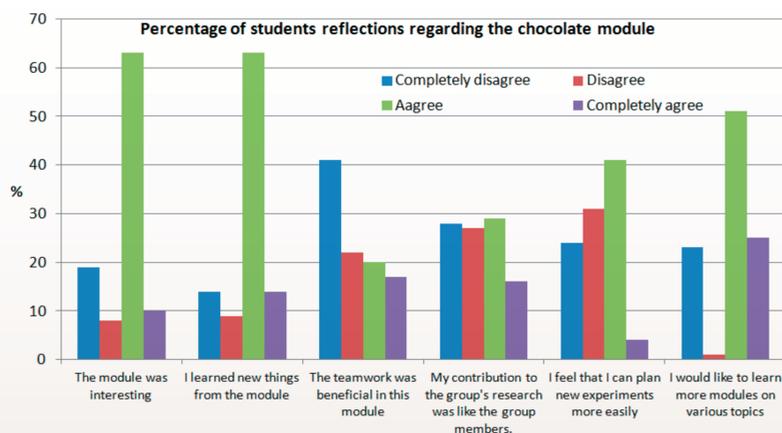
**Critical comparison** - Students read and compare the information provided in nutritional labels of common kinds of olive oil, using relevant criteria.

**Summary and Decision making** - Students draw conclusions from all parts of the module and decide which oil they prefer in their salad dressing, referring to the decision making process.



Oil Survey

### After Implementation: Student's Reflection & Knowledge Gain



*"I loved this way of learning chemistry by using my phone for answering questionnaire and viewing immediate results, conducting lab experiments and tasting the results."*

*"I was successful in influencing my family regarding oil and its uses. I explained that it is better to use extra-virgin olive oil and the reasons for this. I stress that we shouldn't use too much oil and certainly not fry food for a long time."*

*"I found this activity fascinating because I like chocolate and it enabled me to learn more about chocolate. I discovered that there was much more about chocolate than I thought!"*

*"I began to see the oil that I use in a different way. I use healthier kinds of oil, and read and understand what is written on the labels on the bottles of oil, as well as understanding how they were produced and what they have in them."*

### Teacher's Reflection

"We really enjoyed developing the module. We learned a lot, from the different stages and challenges we faced while developing the module and adapting the module to all sorts of students."

"This teaching experience, which was out of the ordinary, was meaningful for us and enriched our experiences as educators."

"We were happy to see that many teachers chose to implement this module in their classrooms and acknowledged our intense work for developing a new way of teaching and learning."

"Using up-to-date technology (mainly smartphones) was important in bridging the gap between teacher and students."

"We would like to introduce more teachers to PROFILES modules and share them with the rest of the community of science teachers."