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## Oil and water experiment

### **Description of the activity**

The experiment took place in Asunduse Kindergarten of pre-schoolers, age 5-7yrs. In total there were 11 children (6 boys and 5 girls), 9 of them made drawings.

The conductors of the test were teachers Kristel and Eneli.

Means used in this experiment: water, cooking oil, food colours, pipettes, plastic cups, glass container.

Used information:

<https://www.questacon.edu.au/outreach/programs/science-circus/videos/oil-and-water>

<https://sciencing.com/molecular-activity-water-vs-oil-21143.html>

Pinterest.com (the teachers favourite)

All discussions during the project were based on Socratic method which means that teachers asked children questions that lead to a logical conclusion that was incompatible with that children`s originally stated belief.

In total it took 24 hours including: preparations, acquiring the supplies, research, executing the experiment, children drawing pictures regarding the experiment, conclusion.

### **Purpose of research**

Purpose of the research is to find out what happens when we mix water and oil (and added colours to make it more interesting).

### **Elaboration and preparation of the research activities**

First, teachers studied the topic and consulted with each other, planned activities, looked for the necessary means and made the order to go through the experiment.

One day before the experiment the teachers asked the children what they think about oil and water together. Then children drew a picture regarding that.



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On the experiment day teachers went to the classroom, put out all the needed means and awoken the interest in starting activities with children.

### **Description of the methodology used**

*Beginning in the 1970s, Novak and his research team at Cornell developed the technique of concept mapping as a means of representing the emerging science knowledge of students. It has subsequently been used as a tool to increase meaningful learning in the sciences and other subjects as well as to represent the expert knowledge of individuals and teams in education, government and business. Ausubel's believed that learning of new knowledge relies on what is already known. That is, construction of knowledge begins with our observation and recognition of events and objects through concepts we already have. We learn by constructing a network of concepts and adding to them. Ausubel also stresses the importance of reception rather than discovery learning and meaningful rather than rote learning.*

### **The Nature of Scientific Inquiry (NOSI)**

1. Observation. Discussion of the topic.

Children thoughts: „Oil rises to the air”, „Water turns yellow”, „Water turns coloured”. „What colours are these”. „If it made of water and foodcolours, can we eat that?” „No, the oil doesn't taste well”.

Before drawing the children were able to see what was used for the experiment.

Drawing “before experiment” pictures.



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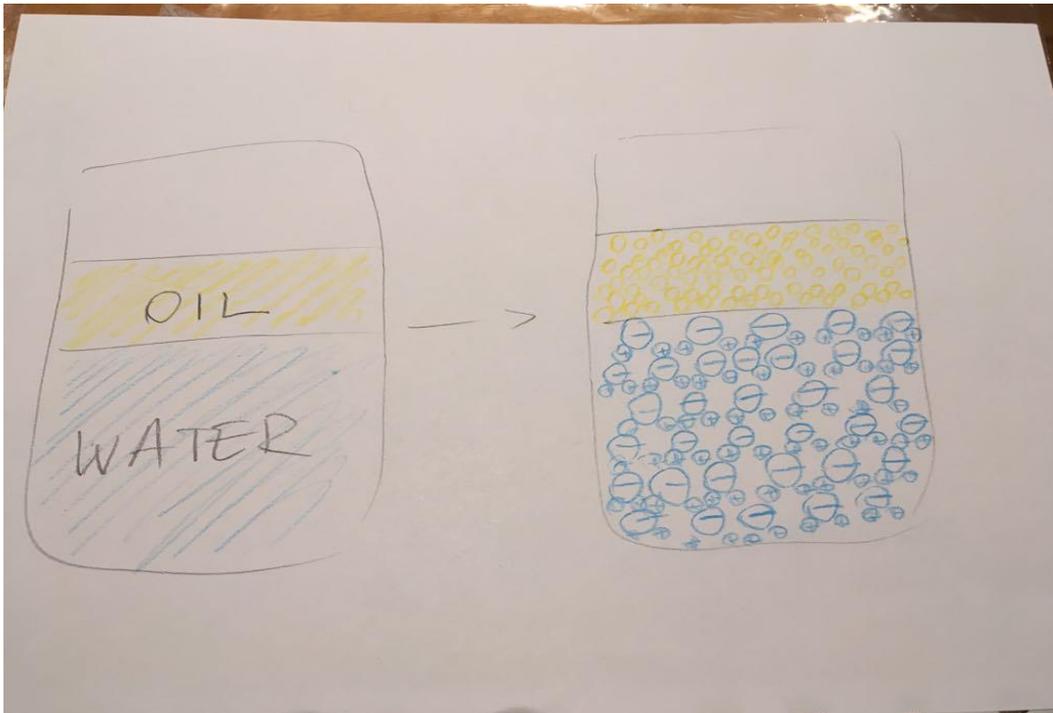
## 2. Experimentation.





### 3. Summarization of the results as laws

Water and oil do not interact due to differences in polarity. Water is a polar molecule, whereas oil is not. Water's polarity gives it a high surface tension. The difference in polarity also makes oil insoluble in water.





#### 4. Hypothesis

Water turns yellow or get coloured and oil rises to the surface.

#### 5. Testing the hypothesis in the lab



„It´s like balloon”, „It´s like tornado”, „It´s like jellyfish”.





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After that, children wanted me to pour all the coloured oils to the water and see what happens then.





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„Maybe it explodes”. „Water turned coloured”. „Oil rises to the top of water”.

### **Final assessment of the activity**

All together there were 11 children who were in the kindergarten all 3 days (on 1. day children draw a picture before they knew anything, on the 2. day children took part of the experiment, on the 3. day children draw a picture with new knowledge of the topic).

9 children of 11 drew a picture before and after the experiment. All 11 children understood, that oil rises up and (unfortunately) there is no explosion. They asked me come back the day after to do something as good as that experiment.