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Tallinna Asunduse Lasteaed

Surface tension (Coin test)

Purpose of the research

Purpose of the research was to find out the knowledge of the children about surface tension.

Description of the activity

The experiment took place in Tallinn's "Asunduse" kindergarten of pre-schoolers, where the age ranged from 5-7 years. The conductors of the test were the teachers Eneli & Kristel. In total there were 9 children, 8 of them took part in drawing a photo of before and after.

Used information:

<https://www.thoughtco.com/surface-tension-definition-and-experiments-2699204>

Before drawing the children were able to see what was used for the experiment.
Means used in this experiment: water, pipette, 3 different size of coins (one of them has hole in it).

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

Elaboration and preparation of the research activities

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

One day before the experiment, the teachers asked the children what they think about how the next surface tension experiment is regarding coins and water. Teachers asked children to draw a picture of that.



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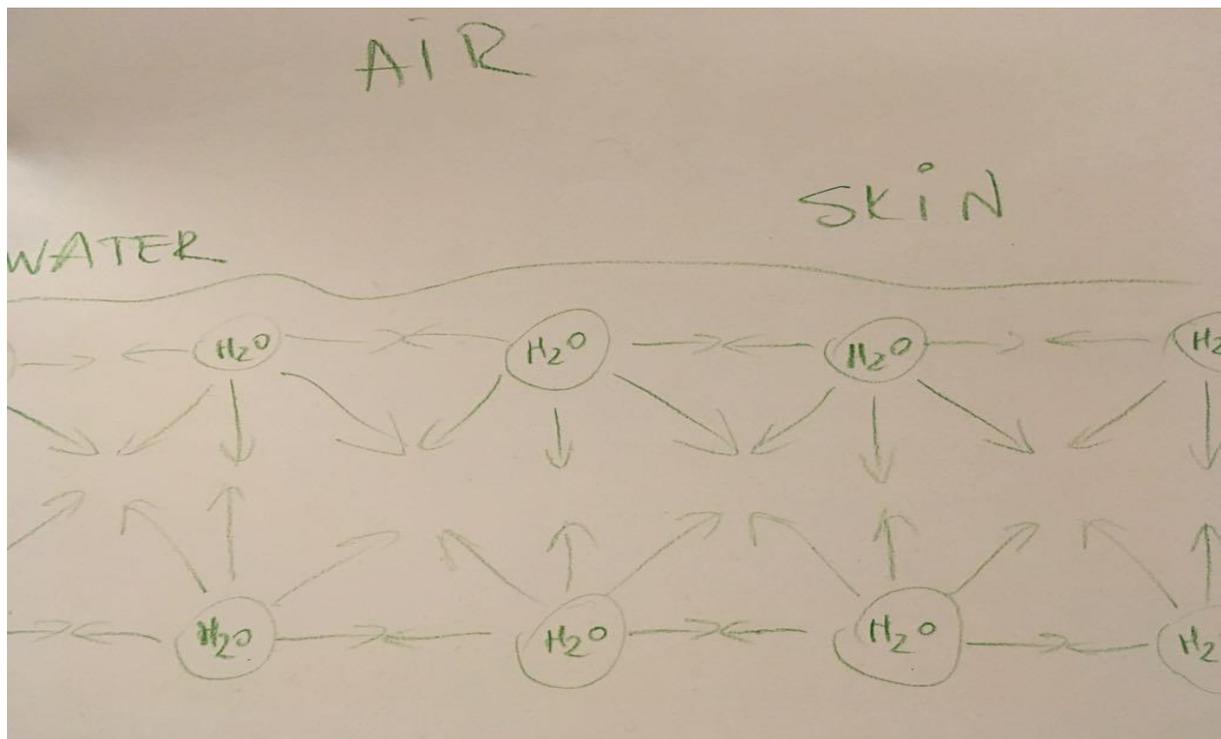
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On the experiment day teachers went to the classroom of the group earlier to put out all the needed means and to awaken an interest in starting activities with children.

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.





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The Nature of Scientific Inquiry (NOSI)

All discussions were based on using Socratic method. Socratic method means Teachers asked children a progression of seemingly innocent questions that ultimately led the respondent to a logical conclusion that was incompatible with that children's originally stated belief.

1. Observation. Discussion of the topic.

“The water will stay on top”, “The water will flow down” , “I don’t know maybe both ways”, “The coins get rusty”, “The water removes all the colour of the coin”.

Drawing “before experiment” pictures.

1. Experimentation





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2. Summarization of the results as laws

The tension of the surface film of a liquid caused by the attraction of the particles in the surface layer by the bulk of the liquid, which tends to minimize surface area.

3. Hypothesis

Water stays on the coin.

Six of the children thought that water will stay on top, two thought that the water will flow down and only one child ended up not deciding.

4. Testing the hypothesis



5. Explanation provided by the hypothesis

Water stayed on top of the coins except on the coins that had a hole inside of them.



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Final assessment of the activity

Before the experiment six children thought that the coin will either get rust or the colour will come off. Two of them thought that the water will clean the coin itself. Two children also thought that the coin will sink. Afterwards they realized that the water will stay on the coin even if the coin has a hole inside of it (but water will go through).