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Underground layers. What is under the ground?

Purpose of the research

Purpose of the research was find out what children think what is under the ground.

Description of the activity

Before activity children drew pictures about what they think and imagine about layers of earth.

Supplies: See-through trashcan, different kinds of items like teddy bears, blouses, a book, a scarf, a purse, a worksheets.

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 11 children, 8 of them being boys and 3 girls.

All discussions were based on using Socratic method. Socratic method means that 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.

Elaboration and preparation of the research activities

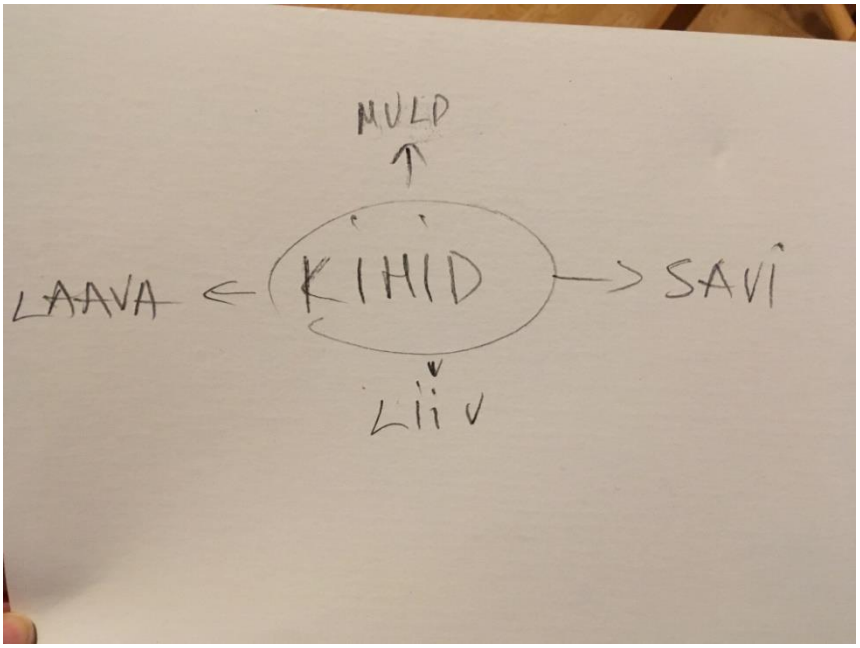
First teachers studied the topic. Teachers made notes, consulted with each other, planned activities, looked for the necessary means and made the order to go through the planned activities.

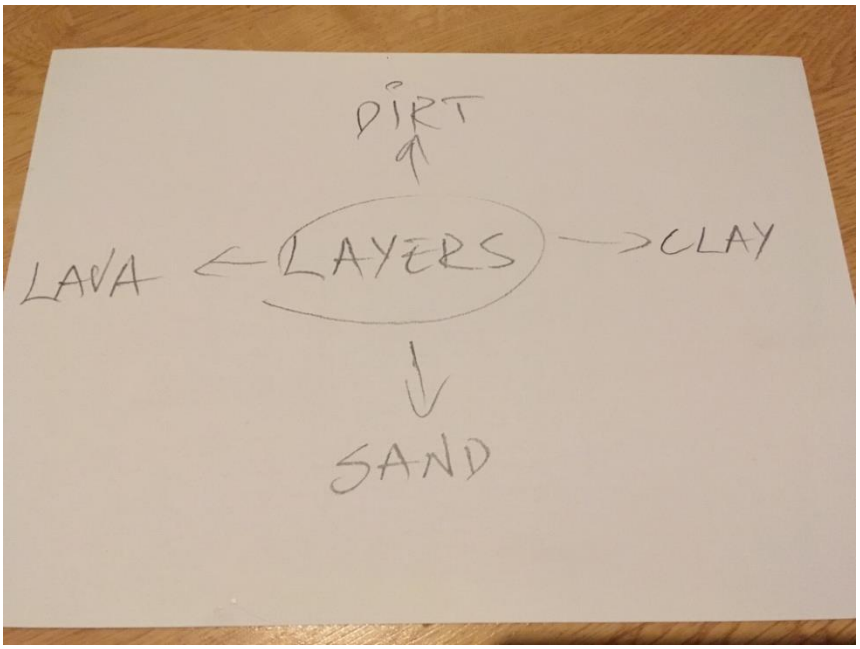
One day before the experiment, the teachers asked the children what is under the ground and what kind of layers are there. Teachers asked children to draw a picture of that.

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.





The Nature of Scientific Inquiry (NOSI)

1. Observation. Discussion on the topic „Which layers are under the ground?”

For the introduction, we talked about earth and layers.

Teachers asked children “What is under the ground?”

Children's thoughts:

“Layer is like a road but very thick.” “Under the ground is sand.” “Dirt.” “Lava.”

2. Experimentation.

   We used a see-through trashcan and created layers. Each child used one item regarding the month they were given, each child was named one of the 11 months (because there were 11 of them), a month per child and the teacher was 12. To see how the layers was created by nature and how the archaeologists will found things deep down.


KILMAPAEV
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PÜHAPAEV

The children: “What trashcan task is this?” “January was long time ago, December is right now.” “When December ends, it starts all over again.” “An earth has less layers than 12.”

3. Summarization of the results as laws

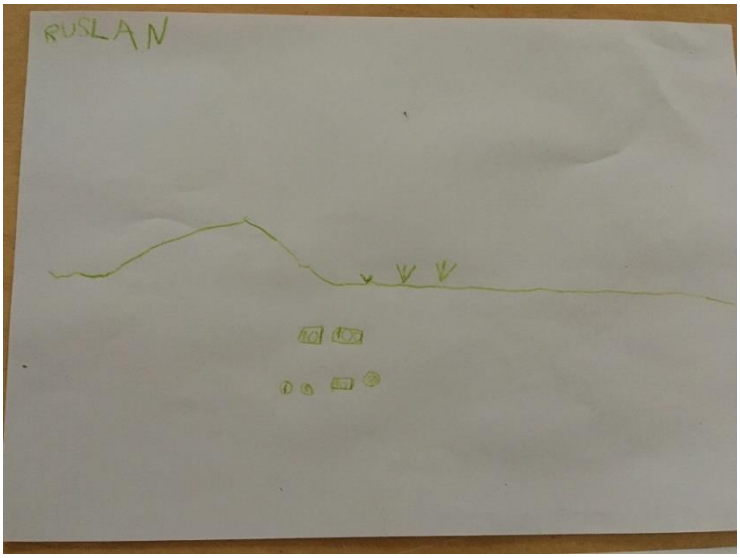
   The interior structure of the Earth is layered in spherical shells: an outer silicate solid crust, a highly viscous mantle, a liquid outer core that is much less viscous than the mantle, and a solid inner core.

   https://en.wikipedia.org/wiki/Structure_of_the_Earth

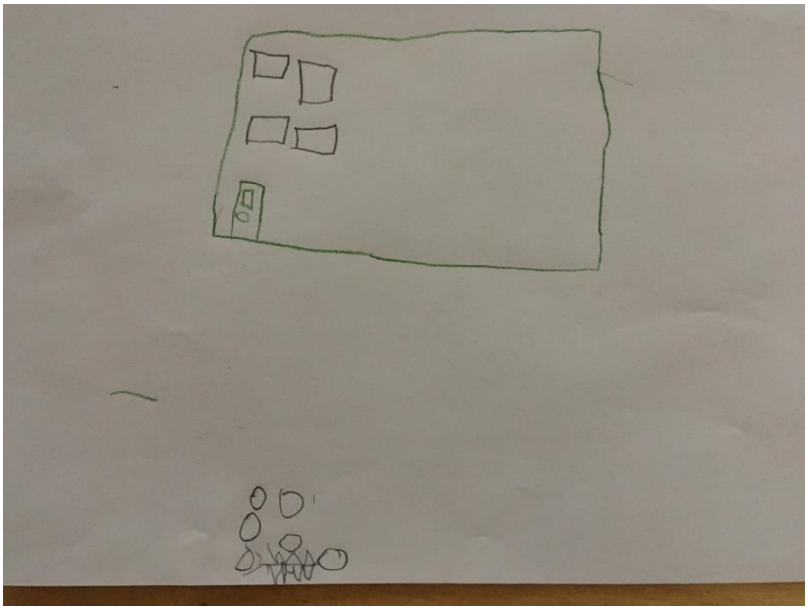
All together there were 6 children in the kindergarten all 3 days (on 1. day children draw a picture before they knew anything, on the 2. day children took part of the experiment and on the day 3. children draw a picture with new knowledge of the topic).

Before the experiment all of the boys thought that under the ground is lava for sure but after that they knew there is much more than only a lava. Most of them thought that under the ground is mostly dirt, sand, roots and grass. One of them thought there is a helmet, shovel and a short-tailed-vole. After the experiment they thought that under the ground is layers of earth, an old walls, skeletons, roots and an oilrig.

Drawing pictures children made before and after the experiment.



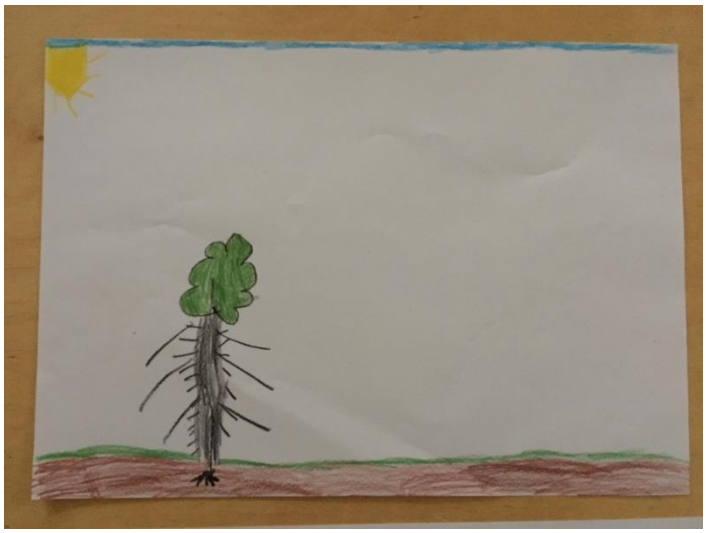
Before: There is money and coins under the ground



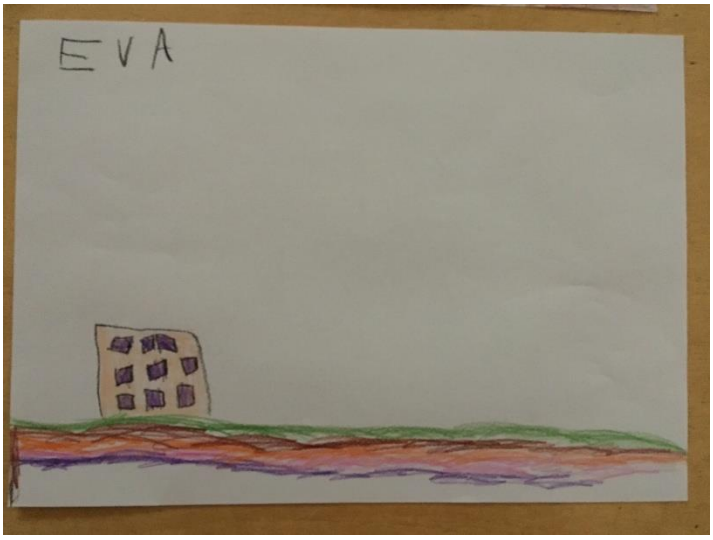
After: There is a skeleton under the ground

Before: Grass

After: Layers of the earth. Rocks where the people died

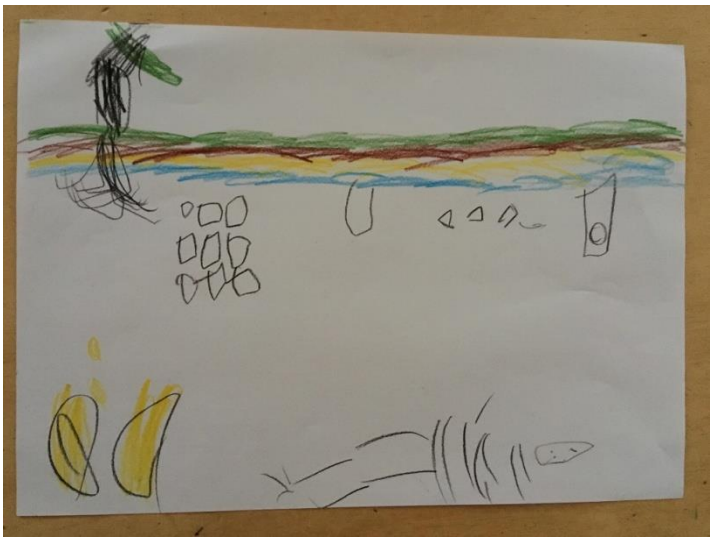


Before: There is dirt and roots of a tree under the ground

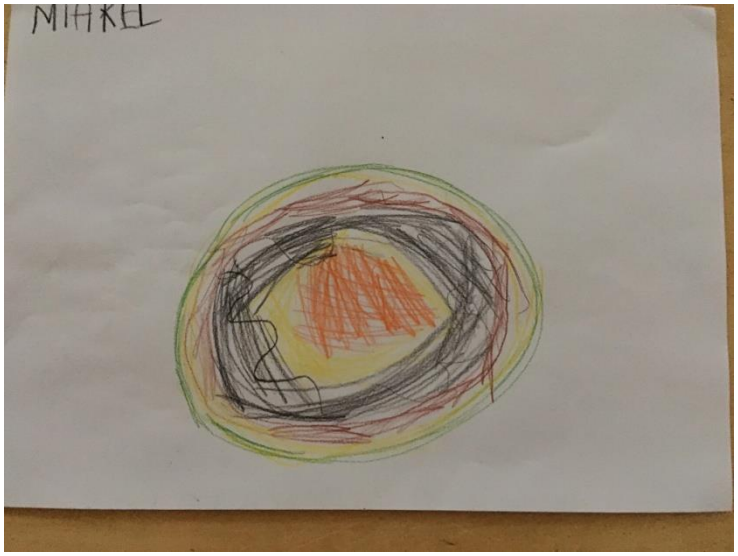


After: Grasses

Before: The dirt, roots of a tree, short-tailed-vole

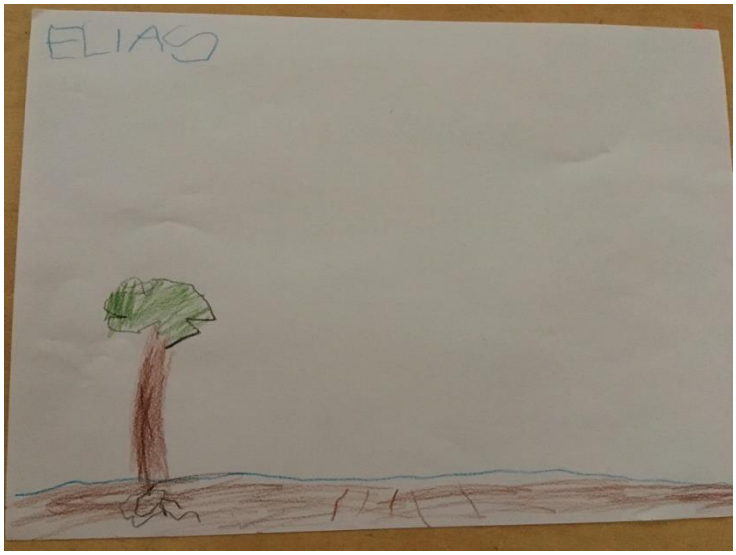


After: Bags of gold, skeleton, roots of a tree and old house



Before: Grass, sand, dirt, thicker dirt, some kind of lava, the right lava

After: An oilrig

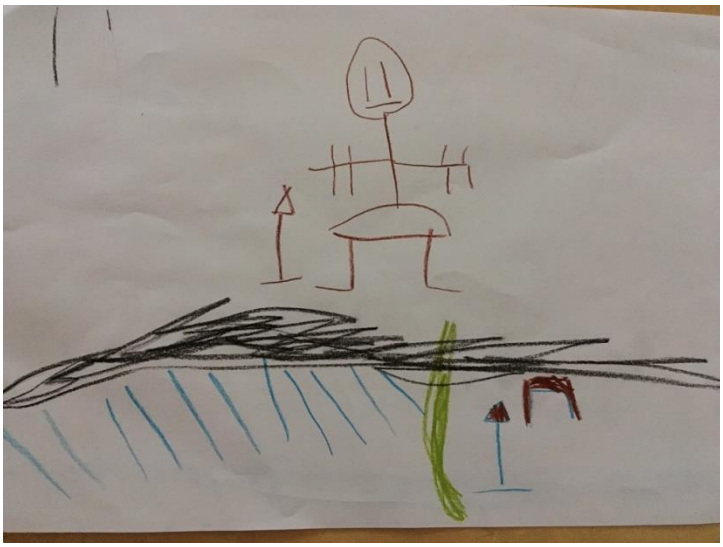


Before: There is roots of a tree under the ground

After: There is rocks, skeleton and roots of a tree under the ground

Before: An earth, water, roots, lava

After: An old walls



Before: There is helmet and shovel what left behind when the lava burst and people were killed

After: Layers of earth