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Three steps to understand “density” and Earth’s layering

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Abstract

The internal structure of the earth is well known as a construction of different layers. In general geologists refer to the Earth’s core, mantle and crust. A main reason for this layering lies in different densities of the layer material. A great step for understanding the Earth’s interior therefore is understanding “density”. Since “density” is a very abstract term for children (especially younger ones) it is helpful to use more than just one technique to explain it to them. There are three steps to gain knowledge of what scientists mean by “density”.

First by playing a game, called “Das Molekülspiel” (“The molecule game”). Through the game children experience how “high density” feels. They easily find synonyms as “tight, narrow” and so on. In the game they become molecules which react to rising and falling temperature and experience high and low density.

In a second step the children exchange their experiences and thoughts in a conversation. An Image with uncomplicated content regarding “high and low density” supports a better understanding (Fig. 1). A verbal summary and explanation completes this step.

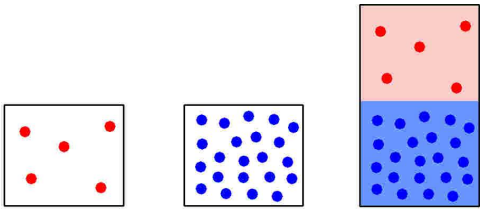

Figure 1: Schematic, elementary explanation of high and low density

In a third and final step an experiment with everyday material (Fig. 2) illustrates and summarizes again what the children have learned.

Figure 2: Experiment with material of everyday life

During the conduction of the experiment it is important to give room for own ideas (Fig. 3). Konfuzius once said: “Explain it to me and I will forget it. Show me and I will remember. Make me try it and I will understand”. This is the main idea behind this step.

Figure 3: Children like to realize own ideas

At this point in the lesson it is about time to get back to the layers of the Earth’s and show images of the Earth’s interior as well as the interior of Earth-like planets. The conduction in the Earth’s mantle could then be a next theme to work upon.