



Background

General didactic background

This sequence deals with the concepts of proportionality, variable and unit through the determination of the densities of two liquids. Density is a familiar concept to the students at grade ten. The suitable age of the students depends on the curriculum and what the teacher wants to emphasize in this sequence. However, the mathematical approach used in this sequence, gives a new point of view to a familiar concept and gives the students a possibility to concentrate either mathematics or science depending on the teacher's emphasis.

Mass and volume of a substance are directly proportional in constant conditions. This gives a possibility to examine their relationship from different points of view: mathematics and science. From the mathematics point of view, proportionality constant and its relationship to the steepness of a linear graph is useful. From the science point of view, the physical meaning is important. Furthermore, the data gives a good opportunity to think about the uncertainty of the result and to make literature comparisons.

Mathematical concepts

Density gives an everyday context to the concept of proportionality. It provides this concept with concreteness and shows to the students the usefulness of mathematical methods: they are tools to get new information in science. Science provides mathematics teaching with authentic data collected by the students themselves. This approach takes into consideration tactile and visual learning styles as well as the auditory learning style in the form of teacher-talk.

Key concepts: Variable, proportionality, proportionality constant, function, unit, density