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Education and Culture
Lifelong learning programme
COMENIUS

Background

General didactical Background

The starting point is a cross-curricular approach with the natural sciences, here with biology and mathematics. The students are to experience mathematics as appropriate, meaningful and interesting through extra-mathematical references. Learning in contexts is to contribute to an intuitive mathematical understanding. On the one hand, the often observed gap between formal mathematics and authentic experiences shall to be closed and, on the other hand, the versatility of mathematical terms is to be experienced with the help of contexts and methods used in the natural-sciences.

Topics from the natural sciences offer the opportunity for truly realistic instruction. Concrete physical or biological contexts can stimulate mathematical modelling activities and lead to authentic experiences. Mathematical contents and methods can be learned in meaningful contexts, and the students' world can be broadened and deepened by mathematical insight. Different references to reality lead to different models and can also contribute to contrasting terminological properties and differing models. The variety of natural-science phenomena permits setting open tasks and working out autonomous mathematical solutions. The variety of references to reality leads to a varied understanding of contextual meaning.

Scientific and didactical Background

The nutrition circle of the German Nutrition Association makes a proposition for an optimal food distribution within a frame of wholesome eating (figure 1). The individual segments indicate the type of food and the size of the segments the respective amount that aught to be consumed for a healthy daily diet. The following types of food are distinguished:

- cereals, cereal products, potatoes
- vegetable, salad
- fruit
- milk, milk products
- meat, sausage, fish, egg
- fats, oils
- beverages

The group of beverages/liquids is not listed as a separate segment in the circle but is placed in the centre, since the weight coming with it, should be about as big as that of all the other foods together.

Figure 1: DGE-Nutrition Circle of the German Nutrition Association, Bonn 2005

The nutrition circle is of particular interest as a class topic, because

- it deals with the topic of food, which concerns all people and is, without a doubt, student-centred.
- on the background of a dramatic increase in defective nutrition and obesity, it is highly topical.
- to get more precise statements, further analyses of the circle are necessary, e.g. working out proportions with the help of percentage calculation.
- it stimulates further mathematical activities, such as the making of pie charts and their analysis.
- it stimulates the meaningful linkage of biological and mathematical topics and thereby allows authentic experiences in maths and shows their relevance.

This project has been funded with support from the European Commission. This publication reflects the views only of the author(s), and the Commission cannot be held responsible for any use which may be made of the information contained therein.