Education and Culture
Lifelong learning programme
COMENIUS

Implementation in the classroom

Soveltaminen luokkahuoneessa, Uporaba v razredu, Implementierung in der Schule, Enseñansa, Ders fikri, Implementation i klasserummet, Enseignement,

Please regard also the chapter "Implementation in the classroom" of the ScienceMath Volume.

The ScienceMath Approach is an interdisciplinary approach between mathematics and sciences like physics, but also biology, chemistry and geography. Theoretical background is the idea of supporting mathematical learning through physical, biological etc. contents and methods. Sciences offer the possibility for realistic teaching. Concrete physical or biological correlations may initiate mathematic activities and lead to authentic experiences.

Thus the ScienceMath Approach is characterised by interdisciplinarity as well as self-dependent work of the students, motivated by worksheets and material for experiments. Both need preliminiary considerations concerning learning content, grade of cooperation and teaching methods.

To the learning content:
The ScienceMath modules relate to normal and typical topics of regular European curricula. So it is important to know that they have to be chosen not as an additional subject matter but as an alternative approach in the normal lessons.

First of all you have to choose a module:

The website offers a very quick access to the modules with information and worksheet (see screenshot below). You´ll find a module theme and an indication about the age for a first hint. The key-words show the learning areas for the related subjects.

Functional Relations 2	
15-18 years	concept of function, functional thinking, linear, sqaure, anti-proportional and other functions, physical experiments in interdisciplinary lessens
Function x^(3/2) and x^(1/2): practical examples with pendulum	
15 - 18 years	function, potential function (rational powers), oscillation of pendulum
Growth	
15 - 18 years	exponential and linear growth, functional relationships, applications of growth, mathematical models, modelling
GPS and fair Insurence Premia	
15 - 19 years	Modelling, functional relations, reflecting
x^-0,5 , Square root function in divisor	
16 years old	Square root function in divisor
Introduction of Trigonometric Function	
16 - 17 years	Trigonometric functions, circulation, oscillation

To the grade of cooperation
The key-words at the website already give hints about the grade of cooperation. E.g. “physical experiments in interdisciplinary lessons” informs about the need of a narrow cooperation between mathematics and physics teacher. “Modelling, functional relations, reflections” indicates more a mathematical perspective in interdisciplinarity.

Special advises for teaching the module can be found after a click (see next screenshot: Advice).

Parabola between Mathematics and Physics
- The Case of Horizontal Launch

Keywords	parabola, horizontal launch
Lesson applicable for	15 to 16 years old students.
Advice	The lessons demand very correlated teaching between two subjects: physics and mathematics. It is not designed to introduce parabola in math lessons but to show its applicability. The mathematics teacher uses the material (measuring results) prepared by the physics teacher in the way described below.

Background	General didactic background Mathematical background The idea of teaching implementation
Teaching material	Possible course Needed equipment Worksheets
Further Information	Experiences Literature

The ScienceMath volume offers more information and help for implementation (available at Franzbeckerverlag, see website > literature or home-page).

Please read chapter 2 of the ScienceMath Volume.
It includes

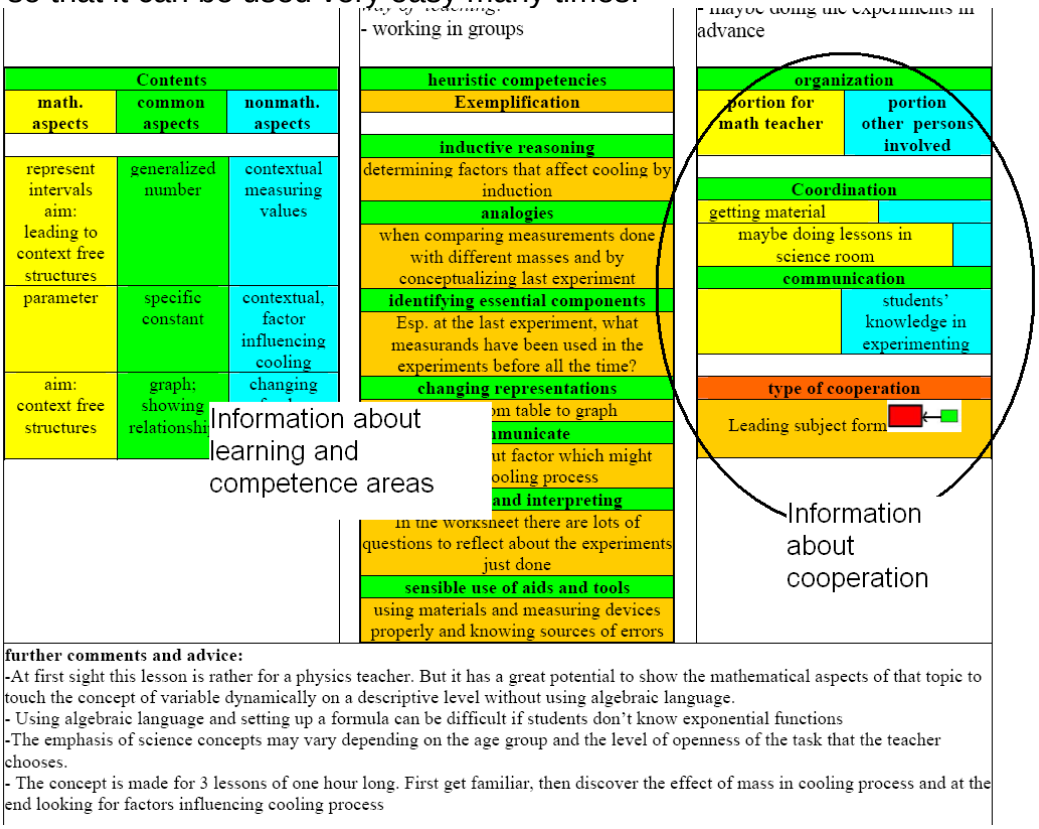
- a conceptional framework of interdisciplinary teaching, which shows that there are different forms of cooperation, e.g. simple and more complex forms.
- “the roof”, a framework for a quick overview over each module (see next screenshot, explanation in chapter 2 of the volume and frames for each module in annex 2 of volume).

To the teaching methods

The ScienceMath modules are developed for self-dependent work of the students. The link “teaching material” (see screenshot above) offers worksheets for the direct use in the classroom.

Hint: At www.sciencemath.ph-gmuend.de/word.htm word versions are available for download and individual changes.

Needed material is described very clear. Most of the proposed equipment is already available in European schools or can be easily collected in private houses. For ScienceMath modules with many experiments it is advised to prepare the material in boxes so that it can be used very easy many times.



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