

## 2. The SMART Mathematics OOC “Mathematical modelling”

The topics for the SMART Mathematical OOC have been chosen according to the above analyzed questionnaire results and to the real, concrete needs of teachers which emerged from the discussion between the project partners during the international meetings.

Activities both for the teachers and their students have been prepared and are now available on the platform for the experimentations in the classes.

The PP&S methodology has been really appreciated in the SMART partnership, also by those partners, like the Dutch and the Swedish, who are used to working with advanced calculation environments.

Four areas have been chosen for Mathematics:

<p><u>QUANTITY (quantitative reasoning)</u></p> <ul style="list-style-type: none"><li>Concept of number</li><li>Use of numbers to represent quantities and qualifier attributes of the real world's objects (evaluations and measurements)</li><li>Comprehension of the meaning of computations</li><li>Idea of the order of magnitude of numbers</li><li>Mental computation/elegant computation</li></ul>
<p><u>SPACE AND SHAPE</u></p> <ul style="list-style-type: none"><li>Recognition of shapes and patterns</li><li>Comprehension of dynamical changes in shapes</li><li>Two- and three-dimensional representations and their interrelations</li><li>Capability of recognising similarities and differences between objects</li><li>Relative position and movements in the space</li></ul>
<p><u>CHANGE AND RELATIONS</u></p> <ul style="list-style-type: none"><li>Representation of mathematical relations in several ways (symbolic, algebraic, graphic, tabular)</li><li>Ability in passing from one type of representation to one other</li><li>Capability to think in functional terms (meaning of rate of change, slope, and so on)</li><li>Link to aspects of other key ideas (Space and shape and uncertainty)</li></ul>
<p><u>UNCERTAINTY</u></p> <ul style="list-style-type: none"><li>Production of data (valid methods for measuring certain features; statistic survey)</li><li>Data analysis, their visualisation and graphic representation; concept of mean and median</li><li>Probability</li></ul>

Marina Marchisio then illustrates the problem format and shows some examples of activities published on the project platform. Some of the proposed problems are those which have already been tested in the Italian PP&S Project, re-elaborated by the researchers of the University of Turin who collaborate in the SMART Project.

The methodology is the same that has been adopted for Science: from a contextualized problem to the mathematical theorization. All problems contain interactive parts on the platform and a system of automatic evaluation is used.

At the end of the project life, the Mathematics OOC will be available to all people interested in the subject, included the TFA teachers.

Training courses for the teachers of the SMART partners schools have been held by the University of Turin and a forum is currently active for those who need help or want to exchange ideas and experiences with colleagues and tutors.