





Teaching –learning module compiled by the PARSEL consortium as part of an EC FP6 funded project (SAS6-CT-2006-042922-PARSEL) on Popularity and Relevance of Science Education for scientific Literacy



Stop having sex – the world is overpopulated!

A grade 10-12 mathematics module on modelling population growth

Abstract:

During the last 200 years the world population has been sextupled and the threat of *overpopulation* – the situation in which a domestic area can no longer support all individuals - is faced by certain parts of the world.

This series of student centred activities engages groups of students to apply mathematical modelling tools in exploring the difficult social, political and ethical question of whether overpopulation is a threat, and if so, what to do about it. The students are introduced to the different tropes of mathematical models and modelling tools. The series assumes a very basic familiarity with exponential functions, but can also be used as an introduction of the concept of exponential growth.

Sections included			
1.	Student activities	Describes the scenario in more detail and the tasks the students	
	(for the students)	should perform	
2.	Teaching guide	Suggests a teaching approach	
3.	Assessment	Gives suggested formative assessment strategies	

Developer:	Claus Michelsen & Jan Alexis Nielsen
Institution:	University of Southern Denmark
Country:	Denmark







Overall Objectives/Competencies: The students are expected to:

- understand the difference between types of models (i.e. verbal, numerical, graphical and algebraic/symbolic)
- understand and communicate about general aspects of mathematical modeling
- be reflective about mathematical models
- be able to argue from mathematics
- graphing data
- evaluate and construct graphs and functions
- identify dependence relation between phenomena and translate those into dependence relations between weighed variables

Curriculum content: exponential and linear growth functions

Kind of activity: thought and model eliciting activities

Anticipated time: 4-6 lessons

Prior Learning: Concept of function

This unique teaching-learning material is intended to guide the teacher towards promoting students' scientific literacy and quantitative literacy by recognizing learning in 4 domains – intellectual development, the process and nature of science and mathematics, personal development and social development.

Its uniqueness extends to an approach to science and mathematics lessons which is designed to be popular and relevant. For this the approach is intentionally from society to science and attempts to specifically meet student learning needs.

This uniqueness is specifically exhibited by:

- 1. a society related and issue-based title (supported in the student guide by a scenario);
- 2. student-centred emphasis on scientific and mathematical problem solving, encompassing the learning of a range of educational and scientific goals;
- 3. including socio-scientific decision making to relate the science and mathematics acquired to societal needs for responsible citizenship.

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