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

Bathing and bubbling with chemistry*

A grade 9-11 science (chemistry) module on
acids and bases and their involvemet in bath bubblers and other effervescent products

Abstract :

In this module students get to know bath bubblers, their composition, and the role/function of the ingredients. The effervescent effect in effervescent medical tablets is based on the same principle. Baking products such as baking soda are an integral part of this activity. The activity provides the oportunity to study acid-base chemistry, and in particular the neutralisation reaction.

Sections included		
1.	Student activities (for the students)	Describes the learning scenario in more detail and the tasks the students should perform
2.	Teaching guide	Suggests a teaching approach
3.	Assessment	Gives suggested formative assessment strategies
4.	Teacher notes	Extend the chemistry and physical chemistry of salts and provides further material for the connection of salt t human health.

Developers: * **Georgios Tsaparlis and Georgios Papaphotis**
Institution: Department of Chemistry, University of Ioannina
Country: **Greece**

* **Based on the Classroom Activity #58, Bath Bubblers, Journal of Chemical Education, 2003, 80, 1416A-1416B.**

Overall Objectives/Competencies:

Through the study of bath bubblers, a common, well-known product of daily use, we aim to connect chemistry with everyday life, and increase students' interest in chemistry. Also to know the role/function of the ingredients. Further, we extend the topic to effervescent medical tablets, the function of which is based on the same principle. Baking products such as baking soda are an integral part of this activity. The activity provides the oportunity to study acid-base chemistry, and in particular the neutralisation reaction. In addition, we have the opportunity to refer to a large number of chemical substances. A notable feature of the practical activity is its **creativity** feature; it is known that students express a preference for such activities.

Competences: abilities of *teamwork*, of *searching* and *evaluating* of information from the *Internet*; finally, *manipulative skills*.

Curriculum content: Chemistry (acids and bases, neutralisation reaction)

Kind of activity: Group work at home, in class and in the lab (in groups of 3-5) students.

Anticipated time: 3-4 teaching periods at school, plus pre-activity preparation at home.

Prior Learning: Acid-base chemistry

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

Its uniqueness extends to an approach to science 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. student-centred emphasis on scientific problem solving, encompassing the learning of a range of educational and scientific goals;
2. including socio-scientific decision making to relate the science acquired to societal needs for responsible citizenship.

Developers: Georgios Tsaparlis and Georgios Papaphotis
Institution: Department of Chemistry, University of Ioannina
Country: Greece