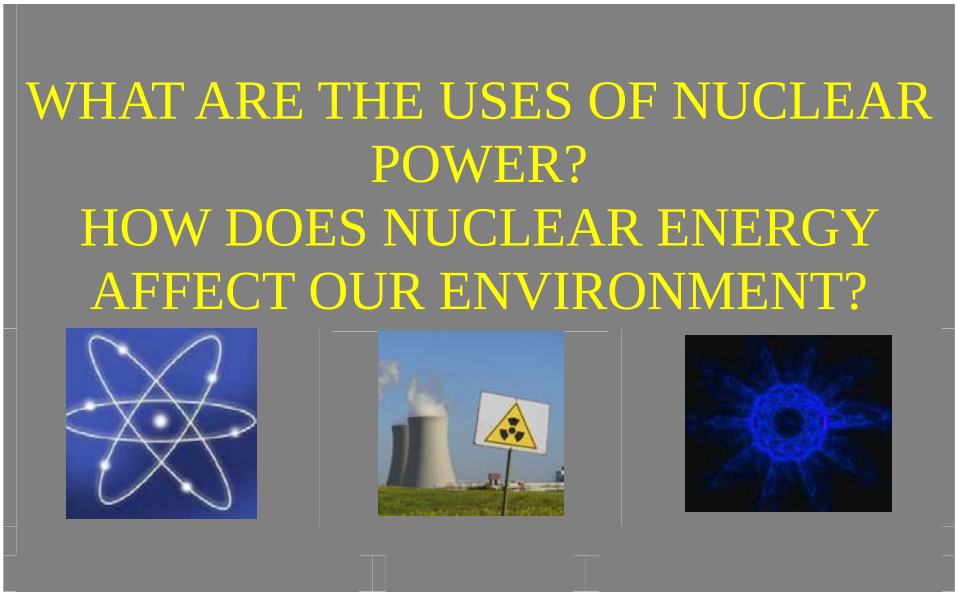
PROFILES IBSE Learning Module

Introduction



A grade 8 Science (Physics/Biology/Civic Education)
Module on Nuclear Power

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Abstract

Science education involves the acquisition of knowledge related to the major scientific themes, but also to the content, used research methods, obtained results and their advantages and disadvantages. As such, for the development of scientific culture, teaching strategies should be developed, helping students to discuss critically about contemporary science achievements and their implications.

The scientific literacy represents an important element that enables citizens to play an active role in making decisions on specific issues of science and technology.

Essentially, it is up to science teachers to promote the development of scientific knowledge and skills needed to evaluate the consequences of any kind (specific critical thinking skills, problem solving and decision making), as well as practical problems arising as a result of the fast scientific and technological development.

Project funded within EC FP7 Programme:
5.2.2.1 – SiS-2010-2.2.1, Grant Agreement No.:266589
Supporting and coordinating actions on innovative methods in Science Education:
Teacher training on inquiry based teaching methods on a large scale in Europe

The core subject of the present work is "Nuclear Energy", which proposes a different approach for this topic, oriented on *Inquiry Based Science Education*. The Module lessons will take place as deliberations mainly, by using the *Structured Academic Controversy* (*SAC*) method.

The deliberation is focused on the exchanges of different ideas and arguments, all of them being then analyzed, in order to take a decision.

The suggested activity is considered to be a contribution to the education for democratic citizenship, by promoting the skills and attitudes specific to the critical thinking and values that guarantee an active, constructive and responsible role for the evolution of society.

The objective of this unit is to evaluate the impact of the using of nuclear energy on the society that we live in, in order to decide whether building a nuclear power plant near the city *X* is beneficial or not for the community. Students will discuss upon the fundamental human rights and freedoms, which may be violated by achieving certain economically beneficial objectives for the society.

The evaluation takes into account the teacher's appreciation of the way that students worked within the group, their presentations and justifications of the final decision and final product, but also assess each student's appreciation of his/her own activity (self-evaluation).

Sections		
1.	Student activities	Describes the 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	Provides additional information about Nuclear Power

Acknowledgement:
This module has been developed in the frame of the Continuous Professional Development Programme organized in the frame of PROFILES project, by "Valahia" University Târgovişte. For more information, please consult the local PROFILES website: http://profiles.ssai.valahia.ro

Overall competencies: The students are expected to learn to be capable of:

- identifying and defining the characteristics of some physical systems encountered in the environment;
- presenting the nuclear phenomena;
- identifying the possible practical application and theoretical knowledge of nuclear physics;
- comparing the phenomena and the physical characteristics of the phenomena, related to nuclear physics;
- classifying the phenomena and the physical characteristics of the phenomena, related to nuclear physics;
- analyzing the causal relationship in the development of physical phenomena, in nuclear physics;
- applying the acquired Physics knowledge in related fields;
- producing a presentation of the results of an investigative approach, using specific Physics terminology;
- reasoning the advantages and disadvantages of the current and future technologies for the environment.

Curriculum content: Nuclear Physics

Kind of activity: *Structured Academic Controversy* and *WebQuest* (discussions through role playing and decision-making).
Also, specific actions are involved:

- presentation of the *central question*, with the view of role distribution and deliberation;
- individual reporting;
- identifying major arguments;
- presentation and analyzing the opinions / positions according to the deliberation process.

Anticipated time: 4 lessons

Prior knowledge:

This unique teaching-learning material is intended to guide the teacher towards promoting students' scientific literacy by recognizing 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 follow a 3 stage model. For this the approach is intentionally from society to science and attempts to specifically meet student learning needs.
This uniqueness is specifically exhibited by:
- a motivational, society-related and issue-based title (supported in the student guide by a motivational, socio-scientific, real life scenario);
- forming a bridge from the scenario to the scientific learning to be undertaken;
- student-centred emphasis on scientific problem solving, an encompassing the learning of a range of educational and scientific goals;
- utilizing the new science by including in socio-scientific decision making to relate the science acquired to societal needs for responsible citizenship.

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