



PROFILES IBSE Teaching/Learning Materials – Overview

compiled by the PROFILES Working Group of the Freie Universität Berlin – Germany



Science in a Class of Its Own: Renewable Energy Sources – “My iPod Works with Energy from Bull Shit”

A Module for Science Instruction –
especially Chemistry – for Grades 8 to 12

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Abstract

The PROFILES module “Renewable energy sources – My iPod works with energy from bull shit” focuses on the question of how biogas is produced and in how far the production of biogas can be used as an alternative to conventional energy production (e.g. fossil fuels). Working together in groups, the students will synthesize biogas. Afterwards, still in groups, the heating value of the biogas will be determined through experiments, and the explosiveness of air-biogas-mixtures will be systematically analysed. Optionally, the combustion products formed through burning biogas can be qualitatively and/or quantitatively measured. The results of the heating value determination as well as the qualitative and/or quantitative analyses which the students carried out by themselves will be compared to the heating values and analysis results of other sources of energy. These comparisons may be important in finding an answer to the above mentioned question.



Professional Reflection-Oriented Focus on Inquiry-based Learning and Education through Science

Subject: Science and/or Chemistry

Grade level: 8th to 12th grade

Curriculum content: Energy and chemical reactions (First Law of thermodynamics, analyzing the energy of chemical reactions; chemical equilibrium in nature and industry (especially 'Le Chatelier's principle'); economical and ecological effects of selected technological systems; the world of macromolecular properties; polysaccharides: building blocks, structure and properties; relevance of biopolymers

Kind of activity: Appropriate judgment, enquiring, explaining, laboratory work, field trip/excursion, role-play, group activities etc

Anticipated time: 4 lessons of 45 minutes for the example introduced here – app. 40 lessons of 45 minutes for the whole IBSE-Module on Renewable Energy Resources

Overall Objectives/Competencies: Basic scientific knowledge regarding the Concept of energy, skills concerning scientific inquiry, communication skills (esp. role-play), informed decision making and appropriate judgment skills.

Attached files		
1.	Student activities	Describes the scenario in more detail and the tasks the students should carry out
2.	Teaching guide	Suggests a teaching approach

Acknowledgement:

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