

Teaching –learning module compiled by the PARSEL consortium
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Popularity and Relevance of Science Education for scientific Literacy



No smoke without a fire - (Un)desirable Combustion

A grade 6 - 8 science (chemistry) module on
Burning and Oxidation



Abstract:

>>What is burned, is gone, destroyed, missing.<< - That is a widely held common belief. At the same time, however, there is a discussion about exhaust fumes and the products of combustion. What happens then with the >>fuel<<? Couldn't a method be developed for combustion without exhaust fumes and without the undesirable consequences?

The lesson unit about combustion and its consequences will

- introduce the concept of chemical reactions using the everyday activity combustion
- introduce the atomic theory in a meaningful connection;
- give insight to the discussion in the media about climate change and the increase in the level of CO₂ in the atmosphere;
- impart factually based judgmental competency and show the importance of knowledge about chemistry when participating in societal discussions and for structuring one's own individual life.

Developer: Martin Lindner, based on Materials from Chemistry in Context. Idea: Ilka Parchmann, unit developed by groups of Teachers in Lower Saxonia and Bavaria

Institution: IPN - Leibniz-Institute for Science Education, University of Kiel

Country: Germany

Sections included		
1.	Student activities (for the students)	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	Gives some background information on Chemistry in Context

Overall Objectives/Competencies: The students are expected to:

- * create questions
- * draw a mind-map or a table of these questions
- * find out which experiments could help to answer the questions
- * undertake experiments
- * cooperate by participating as a member of a group in a discussion on the outcomes of the experiments to answer the questions;
- * understand the change of the materials which are burned as oxidation;
- * decide how far human use of burning affects the atmosphere.

Curriculum content: Oxidation, concept of chemical reaction

Kind of activity: Creating a plan for inquiry, doing experiments, combining experimental results with the leading questions.

Anticipated time: 5-6 lessons

Prior Learning: basic knowledge on the particle concept of matter and donor-acceptor concept

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

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