

Energy saving – Group work

1 Students' prior knowledge

No particular prior knowledge is necessary for this group work.

2 Ideas for teaching

2.1 Learning objectives

The students will:

- know how much energy is needed in a private household.
- know that private and public transportation requires energy.
- recognize that artificial lighting accounts for a significant portion of electricity costs.
- become aware of the extent to which communication consumes energy.
- learn about options for saving energy in the listed areas.

In addition, the students will hone their skills in conducting research, working with sources of material, giving presentations, and communicating.

2.2 Motivation

Before the students start on the work assignments, they should be made aware that energy saving is an important and current topic. The class will already be familiar with some of the ecological and economical aspects. This topic is frequently discussed, especially in the media. A list of reasons why energy saving is necessary and sensible is useful at the beginning of the group work. This list may include the following items:

- Costs for energy sources can be saved.
- Pollution of the environment is reduced.
- The availability of energy sources (fossil fuels) is limited.

2.3 Possible teaching plan

A minimum of two double teaching periods should be planned for the group work, and at least one additional class period for the presentation of the results.

Various areas of the students' everyday lives are taken into consideration. This relevance to everyday life can also motivate the students to examine the topic.

Key elements of this group work are the presentation and discussion of the results in front of the whole class. This ensures that all students learn something about each area. In addition, this allows the teacher to positively influence the students' work attitude. Through the creation of a presentation and the associated discussion of the appropriate way to present the results, the students will have an opportunity to reflect more intensively on their topic.

Division of the class into groups is envisaged. Each group should examine one of the four possible topics. With large classes, it is possible that several groups will work with the same topic.

The topics are:

- Saving energy at home
- Saving energy in traffic and transportation
- Saving energy in lighting
- Saving energy in communication

The groups will deal with specific questions on the topics. These questions are consolidated on cards. Each group receives the card that is relevant to its topic.

Possible materials:

The students can gather the information on the individual topics through online research. Suitable links are compiled in the “Saving energy” link list. Other materials can be used as well:

Saving energy at home	(Home’s) electricity, gas, or heating oil bills Online research would be required to extend the analysis to the entire country or the whole world.
Saving energy in traffic and transportation	Information on modern drive systems (electric, liquid gas, hybrid systems, etc.), for example, sales brochures from car manufacturers
Saving energy in lighting	Information on the performance of light bulbs and light fixtures (for example, on packaging), EU legislative texts
Saving energy in communication	Information on (global) use of communications devices Online research is required for this.

2.3.1 Summary and presentation of the results

Each group will present its topic to the rest of the class. It is possible to present the results as charts (for example, power consumption), mind maps, or overview graphics. This should be followed by a critical discussion about the results and possibly further development of individual solutions as a class.

2.4 Possibilities for variation

There are numerous possibilities, especially regarding the informational materials. If enough computers are available for all students, each student can conduct his or her own online research. Links from the link list can be used as a starting point. It is also possible to print various sources to hand out to the students. In addition, other materials from the “Saving energy” media package can be used.

As is generally possible with group work, differentiation can occur when the groups are formed (size, diversity with respect to motivation, achievement, prior knowledge).

The topics differ in scope and complexity. It is possible to challenge the students to develop “big solutions.” On the one hand, this means assembling ideas of what they themselves can do or what each individual can do to minimize energy consumption, that is, to save energy. On the other hand, this also means considering and discussing political solutions (for the region, home country, or world). These sorts of solutions already specifically exist for lighting, making this topic more of a research assignment. In addition, the students can come up with and present their own ideas.