

## Energy and Life

Students are introduced to the idea that energy use impacts the environment and our lives.

Through a series of activities, students understand how they use the energy and how this is transformed from one type to another.

They discuss different types of renewable and nonrenewable energy sources, as well as the impacts of energy consumption.

Assess some of the benefits and costs associated with the production of energy in Europe from renewable and non-renewable sources.

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**Student aged:** 13-14.

Language level: A2 (based on the common European framework reference for languages)

**Duration:** 3 teaching periods

### 1st Teaching period (50 minutes)

#### 1st Activity:

Time: 10 minutes

Type of activity: engage through individual work and classroom discussion

Class organization: classwork

Actions/Tasks: The teacher asks the students to take a poll “What do you know about energy?” then initiates classroom discussion about energy. As a class, discuss how you can feel, hear and see energy (for example: wind, solar and sound energy or what energy does).

#### 2nd Activity:

Time: 25 minutes

Type of activity: engage and explore using a PowerPoint presentation

Class organization: classwork, individual work

Actions/Tasks: The teacher shows a PowerPoint presentation in order to explain the concept of energy in Physics and introduce new vocabulary and explain the notions involved. Students write in their notebooks.

#### 3rd Activity:

Time: 10 minutes

Type of activity: classwork

Class organization: group work

Actions/Tasks: The teacher asks the groups of students to write down the exercise from the PowerPoint. Then initiates classroom discussion in which each group of students has to present what forms of energy they found in a certain picture and if that one is a renewable one or not.

**4th Activity:**

Time: 5 minutes

Type of activity: Investigation:

Class organization: pair work

Actions/Tasks: Students search for clues of energy around them. They relate their energy clues to the products they encounter every day. The teacher ask for them to write down the item that uses energy, source of energy and to estimate the daily running time for this item (they can finish the activity at home as homework in order to have more examples)

**2nd Teaching period (50 minutes)**

**1st Activity:**

Time: 10 minutes

Type of activity: art creation on a digital tool and practice vocabulary

Class organization: pair work

Actions/Tasks: The teacher asks for the students to use <https://wordart.com> to create a small piece of art using as many words related to energy from the previous lesson.

**2nd Activity:**

Time: 15 minutes

Type of activity: video projection and discussion

Class organization: classwork, individual work

Actions/Tasks: The teacher asks for examples of the use of energy (examples can include the wind pushing us on a windy day, or moving a sailboat or a kite). Discuss other examples of energy, such as the sun, and how it is used. Have the students come up with their own example and then ask them to watch the provided video in order to find out the basic principles of how electrical or thermal energy are used, produced and how these are transformed into different other types of energy.

**3rd Activity:**

Time: 15 minute

Type of activity: research, reading and communication

Class organization: individual work and pair work

Actions/Tasks: Teacher initiates classroom discussion about sources and technologies used in energy production and ask the students to read more information about renewable and nonrenewable sources of energy from: <https://www.eia.gov/kids/energy-sources/>

Students are asked for their opinions: Does energy production have social, economic and environmental implications? What are the key benefits of renewable energy for people and the planet?

#### **4<sup>rd</sup> Activity**

Time: 10 minutes

Type of activity: filling in a worksheet H5p

Class organization: individual work

Actions/Tasks: Teacher assigns an exercise to 'fill in the blanks' with the appropriate terms based on the information they have and what they have learned in the previous activities.

### **3<sup>rd</sup> Teaching (50 minutes)**

#### **1st Activity:**

Time: 10 minutes

Type of activity: Brainstorming

Class organization: whole class

**Actions/Tasks:** The class brainstorms about energy sources to be developed for electrical energy production; they must assess the social, economic, and environmental implications of each energy source. The teacher writes their ideas on the board.

#### **2nd Activity:**

Time: 20 minutes

Type of activity: Research and collect data, discussion

Actions/Tasks: The teacher presents Renewable energy directive from the website: [https://ec.europa.eu/energy/topics/renewable-energy/directive-targets-and-rules/renewable-energy-directive\\_en#2021-revision-of-the-directive-](https://ec.europa.eu/energy/topics/renewable-energy/directive-targets-and-rules/renewable-energy-directive_en#2021-revision-of-the-directive-) and then provides data collection - EU energy in figures, an excel file *energy\_statistical\_countrydatasheets.xlsx* downloaded from [https://ec.europa.eu/energy/data-analysis/energy-statistical-pocketbook\\_en?redir=1#country-datasheets](https://ec.europa.eu/energy/data-analysis/energy-statistical-pocketbook_en?redir=1#country-datasheets)

The students are asked to extract and analyze data for four countries including their own country in order to notice what the trends in energy development are. They have to name the three major sources of electrical energy in these four countries and decide which country has the largest dependency for non-renewable sources of electrical energy.

Teacher asks the students how they think that our country could switch from using nonrenewable to renewable energy.

**3rd Activity:**

Time: 20 minutes

Type of activity: creating a conceptual diagram on a digital tool

Class organization: group work

Actions/Tasks: The teacher ask for a mind diagram Energy Sources developed in <https://www.mindmeister.com/>. Groups of three students have to collaborate to design the diagrams taking into account all energy sources and the fact that all energy sources have both positive and negative aspects. At the end they have to exchange impressions and evaluate each other, reexamine their own products comparing with other products and improve these.

Follow-up activities:

- Making Renewable Energy Poster Presentations in your classroom;
- Plan a promotional campaign to reduce electrical energy consumption in your school