

LET'S TALK ABOUT ... ENERGY

LESSON PLANS

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TOPIC: ENERGY	Course: Third of ESO	Timing: 5 hours
SCENARIO: LET'S TALK ABOUT ... ENERGY		

SUBJECTS OWN SKILLS

Students will be able to:

1. Understand that technology cover different knowledge trying to solve the human needs according to the society.
2. Relate technology with the factors that allow the economic and social development, looking for achieve solidarity and sustainable purposes.
3. Analyse objects and technological systems to understand and describe how it works? And what it produces? By using correct terminology and symbolism.
4. Work in a creative and responsible way to take decisions, showing respect to the partner's decisions.
5. Use TIC and internet in a responsible way as a tool.
6. Evaluate critically the technological progress and the influence in the society and the environment.
7. Analyse and interpret diagrams.
8. Communicate ideas and technical solutions, using graphs, ICT, etc., with an appropriate language.

TRANSFERIBLE SKILLS**Communicative skills.****1. Linguistic and audio-visual; artistic and cultural.**

Students will be able to:

- 1.1. Interact with other students and approach other cultures in an adequate way.
- 1.2. Relate observations, explanations, thoughts, emotions, opinions and develop arguments about te consumption of energy.
- 1.3. Acquire specific vocabulary related to energy.
- 1.4. Understand and express messages in different ways such as writing, talking and drawing.
- 1.5. Treatment of information shown in class.
- 1.6. Be in contact with different kind of texts and visuals, and be able to use it in a correct way.

2. Artistic and cultural.

Students will be able to:

- 2.1. Understand the diversity of technology productions according to the society, focused in the energy consumption.
- 2.2. Use of graphics to understand the energy consumption in our world.

Methodological skills:**3. Information handling and digital competences.**

Students will be able to:

- 3.1. Access and communicate information about energy using different supports including ICT tools to learn, and transform this information into personal knowledge.
- 3.2. Understand the importance of information and communication to know the differences, and to interact in a globalized world.

4. Mathematical.

Student will be able to:

- 4.1. Knowledge and use of the basic mathematical elements.
- 4.2. Solve problems.
- 4.3. Ability to analyse and interpret data and argumentations.
- 4.4. Analyse, interpret and express information and dates given by different ways such as tables, lists and diagrams.

5. Learning to learn.

Student will be able to:

- 5.1. Develop strategies to understand the contents.
- 5.2. Make use of guidance.

Personal skills:**6. Autonomy, initiative and decision taking.**

Students will be able to:

- 6.1. Create, initiate, develop and assess individual or collective activities with creativity, confidence, responsibility and critical thinking.

Personal, social and civic skills**7. Knowledge of and interaction with the natural world.**

Students will be able to:

- 7.1. Interpret and use the knowledge about energy to predict consequences and take reflective action in order to preserve and improve living conditions.
- 7.2. Knowledge achievement about the energy consumption and describe the processes that take place in it.
- 7.3. Predicting consequences.
- 7.4. Responsibility in the use of natural resources and take care with the environment.
- 7.5. Understanding the influence of humans in the environment.
- 7.6. Responsible consume.
- 7.7. Identify the main problems related to the energy consumption, make observation and asking question to solve them by using the knowledge learnt.
- 7.8. Argue conclusions on the consequences of different lifestyles according to the energy consumption.

8. Social and civic.

Students will be able to:

- 8.1. Understand the social context where she/he lives.
- 8.2. Develop values and ethic criteria related to the science and technology in reference to the energy consumption.
- 8.3. Take decisions in a world where scientific and technological advances are very quick and have influences in the energy used, so that in lifestyle, society and environment.

AIMS

1. To be aware of the importance of the use of energy in our society, and the human evolution achieved by it.
2. To understand, analyse and describe what is energy.
3. To understand, analyse, describe, and compare the different energy resources used during the history.
4. To use energy in a responsible way.
5. To help learners to understand that learning can be achieved in a second language.
6. To be respectful with different cultures.
7. To understand different ways of life.
8. To understand the importance of the use of energy in our society.

RESOURCES TO USE

1. Power point presentation.
2. Student worksheet. Activities proposed.
3. Internet.
4. Graphics.
5. Material given by teacher.
6. Help and examples in activities. Grammar scaffolding.
7. Calculator.
8. Tools to draw (angle conveyor, pencil, colours, etc.)
9. Excel and Word or similar software.
10. Peers and self-assessment.

PERSONAL AND EMOTIONAL DEVELOPMENT

- Make the effort to participate doing activities.
- Collaborate with partners.
- Give opinions in a critical way.
- Respect opinions given by partners.
- Give the best of him/her-self
- Assess him/her-self.
- Assess partners in a correct way.
- Develop awareness about energy its use and the environment.
- Work in teams.

GOALS: By the end of the scenario students should be able to:	HOW DO YOU KNOW STUDENTS ARE MAKING PROGRESS?
1. Identify different energy resources and describe advantages and disadvantages of their use.	1.1 Student identifies different energy resources used and describes how we can use them. 1.2 Student identifies the environmental problems due to the use of energy resources, explaining the reason for these problems. 1.3 Student describes advantages and disadvantages in the use of different energy resources.
2. Calculate work produced by a force.	2.1 Student calculates the work produced by a force. 2.2 Student uses the different energy units correctly.
3. Identify the importance of an energy rational use.	3.1 Student identifies and describes the importance of a rational use of energy, proposing solutions.
4. Describe and build diagrams.	4.1 Student builds a word search following the rules proposed. 4.2 Student solves a word search made by a partner. 4.3 Student builds a sector diagram. 4.4 Student compares sector diagrams and extracts conclusions.
5. Identify types of countries according to their energy consumption.	5.1 Student identifies developed, developing and underdeveloped countries according to the energy consumption per capita. 5.2 Student gives rational opinions about energy resources consumption by different countries.
6. Propose energy solutions to a house.	6.1 Student proposes solutions to obtain heat and electricity in a house without electricity grid connexion. 6.2 Student draws the house proposed.
7. Solve Hieroglyphics by asking questions about energy.	7.1 Student answers questions about energy to find hieroglyphics.
8. Read and discuss about texts proposed in different activities.	8.1 Student read and understands texts about energy. 8.2 Student discus about the topic read in a text with partners or

	with the entire group.
9. Work in groups. Give an opinion and share information.	9.1 Student works in group, giving his/her opinion, participating and respecting the ideas from the classmates. 9.2 Student shares the information.
10. Do research and give solutions to the proposed problem in a critical way. Accept and criticize, in a positive way, solutions given by partners. Express his/her opinion.	10.1 Student researches solutions searching the information in a correct way. 10.2 Student proposes rational ideas and respects the ideas from the classmates. 10.3 Student uses internet (to obtain information) and different computer programs in a correct way

CONTENT	
Teaching objectives (What I plan to teach)	Learning outcomes (What learners will be able to do by the end of the scenario)
<ul style="list-style-type: none"> - What energy is? - Use of energy. Advantages and disadvantages. - Energy resources. - Renewable energy resources (Hydropower, solar energy, wind energy, wave energy, tidal energy, geothermal energy, biogas, biofuel, waste energy) - Fossil fuels (coal, oil, natural gas) - Nuclear energy. - Compare sector diagrams. - Atmospheric pollution due to the use of energy. Environmental problems. - Rational use of energy. - Differences between countries according to the use of energy. - Energy vocabulary. - Energy units (Joule, calorie, Kwh). - Work. Make easy calculations about how to obtain the work. - How to build a sector diagram (with an angle conveyor or with Excel (or a similar program)). - How to build a word search. - How to follow rules proposed. - How to obtain electricity and heat in a house without electrical grid connexion. - How to solve a hieroglyphic. - How to work in collaborative groups. - Study, analyse, and comparison of the different kind of energy resources. - Debate about energy resources in groups. - The use of internet to obtain information. 	<ul style="list-style-type: none"> - Identify key vocabulary. - Identify the different kind of energy resources and describe advantages and disadvantages. - Describe how the different combustion engines work. - Compare (speaking and writing) different energy resources and different sector diagrams. Obtain conclusions. - Describe briefly some energy resources, their uses and environmental problems produced by them. - Classify countries according to the energy consumption per capita. - Identify situations that suppose a rational use of energy (or water) - Draw sector diagrams (with an angle conveyor or with a draw program) - Listen and understand, with a critical point of view, different information obtained on internet (videos, texts). - Interpret texts to achieve conclusions. - Calculate the work caused by a force. - Work in collaborative groups. - Have an easy conversation about the different kind energy resources, by using a correct vocabulary and in a suitable way. - Identify and propose solutions to obtain electricity and heat in a house without electrical grid. - Draw a house using energy resources to heat and produce electricity (a house without electrical grid connexion). - Create a word search following rules. - Solve a word search made by a partner. - Discuss in class with partners about energy topic, giving reasons and respect the opinions given by partners.

COGNITION	
Teaching objectives (What I plan to teach)	Learning outcomes (What learners will be able to do by the end of the scenario)
<ul style="list-style-type: none"> - To identify energy vocabulary. - To compare, to relate, to describe, and to analyse the different kind of energy resources. - To analyse and compare countries with a different use of energy. - To debate in groups the different kind energy resources, advantages and disadvantages (such as: the main energy resources used, how they work, what are their uses) by giving opinions and decide the main aspects of each one in order to be described and compared. - Decide the best engine option between different possibilities. - To understand concepts and apply them to justify the use of some energy resources. - To understand and memorise some information about energy. - To propose solutions to obtain heat and electricity in a house without electrical grid connexion. - To understand, and describe sector diagrams. - To draw sector diagrams. - To make easy calculations in order to calculate the work done by a force. - Identify the main energy units. - To build a word search following rules. - To solve hieroglyphics. - To describe some environmental problems due to the use of energy. - To understand and describe the importance of a rational use of energy (water). - To interpret instructions. - To follow teacher's rules. - To understand and select information (such as on internet or in texts) with a critical opinion. - To select information on internet. - To be able to assess partners and to assess him/her-self. 	<ul style="list-style-type: none"> - Identify energy vocabulary. - Identify, analyse, describe and compare different kind of energy resources. - Identify and describe some environmental problems due to the use of energy. - Identify and propose a rational use of energy (water). - Classify countries according to the energy consumption per capita. - Identify and use words related to the topic (energy). - Calculate the work done by a force. - Use the energy units correctly. - Build sector diagrams. - Analyse and compare diagrams, obtaining information. - Build a word search. - Propose and draw a house that use different energy resources to obtain electricity and heat (without electrical grid connexion) - Solve a word search dome by a partner. - Identify and match images and energy resources. - Understand how we can use energy resources, describing advantages and disadvantages. - Discuss in a critical and properly way some aspects about the topic (energy). - Decide the best energy resource between different possibilities by analysing their use, the environmental problems that can cause, the availability and the difficulty to be used. - Interpret pictures and texts. - Work in collaborative groups following some rules. - Do a self-assessment and assess the partners.

COMMUNICATION		
Language of learning (key vocabulary will be done)	Language for learning (Language is scaffold by writing and talking frames and by giving examples, models and help grammar)	Language through learning
<ul style="list-style-type: none"> - Essential and new vocabulary associated with energy, such as: heat, electricity, energy resource fossil fuel, coal, oil, natural gas, solar energy, wind energy, wind turbine, waves energy, geothermal energy, hydropower, dam, waste energy, biofuel, biogas, solar cell, solar collector, tidal energy, nuclear energy, radioactivity, Joule, calorie, Kwh, energy consumption per capita, global warming, greenhouse effect, acid rain, chemical fog, environmental pollution, developed country, developing country, underdeveloped country, climate change, rational use of energy. - Language to build questions, to give opinions, to compare, to relate cause effect, in order to write sentences or to have a conversation. 	<ul style="list-style-type: none"> - How to write a word: <i>Can you spell it?</i> - How to make comparisons. Ex: <i>U.S.A. uses (more/less/the same quantity of) oil than ...</i> - How to describe or to define: Ex: <i>Oil is a liquid fossil fuel.</i> <i>A combustion reaction consists in...</i> <i>Acid rain can destroy...</i> <i>Carbon dioxide produces ...</i> <i>First of all</i> - How to predict different situations. Conditional sentences. Ex: <i>To obtain heat we would need to install</i> - How to explain. - How to justify. Ex: <i>I don't think so, because ...</i> - How to give opinions and how to add different points of view. Ex: <i>What do you think about...</i> <i>I think ..., I agree, From my point of view ...</i> - How to relate cause-effect. Ex: <i>Global warming is produced by ..., climate is changing because...</i> - How to introduce yourself: Ex: <i>Hello/Good morning, my name is ...</i> - How to debate in groups. 	<ul style="list-style-type: none"> - Looking for information (using media). - Using internet. - Using a dictionary. - Asking and answering questions. - Explaining the meaning. - Asking to the partner or the teacher.

CULTURE

- Understand the social, economic and way of life changes due to the use of the different energy resources during the history.
- Understand the importance of the energy in our actual lifestyle.
- Understand the importance of a responsible use of energy and the limited Earth resources, being respectful with the environment.
- Understand the different energy resources used according to the developing of a country or the energy reserves they have. Understand the energy resource used in a country according to cultural and economic reasons.
- Understand the importance of a rational use of energy.

CRITERIA FOR ASSESSMENT (Students should be able to...)

- Understand and describe different energy resources and their uses.
- Calculate the work produced by a force, using the energy units correctly.
- Understand and describe some environmental problems due to the use of energy.
- Understand and describe the importance of a rational use of energy.
- Understand, interpret and compare and describe graphs (sector diagrams). Extract conclusions.
- Create a sector diagram.
- Propose solutions to obtain heat and electricity in a house without electrical grid connexion. Draw the solutions proposed.
- Build and solve a word search.
- Solve hieroglyphics by solving questions about the topic (energy).
- Discuss with the partner or in class different aspects about the topic in a critical way.
- Individual work (worksheet-portfolio).
- Group work (collaborative work).
- Follow the rules (instructions).
- Give oral and write opinions and share it with the partner.
- Realize and interpretation of pictures and texts. Match pictures with words.

A tool that can help in the assessment process is the use of rubrics.

It is important to consider:

- Student should know the way to asses.
- Each activity should be considered (I propose in the student' worksheet different marks for each activity).
- Not all the students have the same language and/or cognition skills, and not all have the same previous knowledge. It should be considered in the criteria. It could be interesting to do an initial evaluation and to propose different activities.
- Propose activities with different difficult level. Consider scale-up activities (optional) for students with high language/content level.
- Consider the intervention in discussions in class, with partners or with the entire group.
- Peer-assessment (work in groups). Give in grids in this unit.
- Self-assessments in individual learning, where each student make his/her own assessment. Give in grids in this unit.

BIBLIOGRAPHY/WEBGRAPHY

www.pixabay.com

en.wikipedia.org/wiki/

eia.gov

statista.com/

datosmacro.com