

COURSE PLANS

UNIT 9

1. BASIS

In this unit we will look at the main energy transformation in nature, and devices and equipment to transform and use energy; energy sources currently available; modern society with growing energy needs; machines, their types and their presence in our lives; breakthroughs in science and technology. There are two projects in this unit: making your own hydro-powered turbine and transforming chemical to magnetic energy.

May June

2. METHODOLOGY

As they work through this unit, pupils will identify energy transformation in nature and in appliances; differentiate between non-renewable and renewable energy, and know some of the energy transformations that occur in machines and plants producing electricity; understand the need for energy and the problems associated with its use; acquire basic energy saving ideas; learn about simple and compound machines, how they work and their uses in human activities; apply mathematical operations and strategies to calculate energy consumption; understand information and acquire vocabulary about energy and machines to express their knowledge both orally and in writing and use ICT to handle information and turn it into knowledge, actively participating in the learning process. Finally, they will review knowledge learned in the unit and throughout the course.

CONTENTS	EVALUATION CRITERIA	LEARNING STANDARDS
<ul style="list-style-type: none"> • Energy transformation in nature. • Transformation of energy in devices and appliances: alternators, batteries, solar panels, electric and combustion engines. • Interpretation and description of phenomena where energy is present and where its transformation can be seen. • Renewable and non-renewable sources of energy. • Plants producing electricity. Types of power plants. • Parts and operation of a thermal (coal-fired) power plant. • Parts and operation of a hydroelectric power plant. • Use of energy in human activities. • Environmental issues arising from the production of electricity and the use of fossil fuels. • Tips for "saving energy in homes." • Machines and energy. Machines: Simple and Compound. • Use of machines in human activities. • Advances in science and technology. • Two projects: making a hydro- 	<p>1. Identify and describe energy transformation in nature, and know about devices and machines that produce energy transformations.</p>	<p>1.1. Define energy transformation. Identify and describe energy transformation in natural phenomena that occur in the environment.</p> <p>1.2. Name devices that transform energy and determine the form of energy that 'enters' and the transformation that occurs.</p>
	<p>2. Expand and consolidate the idea of energy sources, know the different types of energy sources and describe the operation of various power plants.</p>	<p>2.1. Define source of energy. Define non-renewable energy source and name various sources of this type. Define renewable energy source and name various sources of this type.</p> <p>2.2. Define an electricity producing power plant, name types of power plants, identifying the fuel used in each of them, and describe, using images, parts and operation of a thermal (coal-fired) power plant and a hydroelectric plant.</p>
	<p>3. Know the uses of energy in human activities and the problems derived from the large consumption of non-renewable sources, and acquire strategies to save energy in homes.</p>	<p>3.1. Name activities that use energy and the sources where energy is obtained, and describe the environmental effects of the production and use of energy.</p> <p>3.2. Name and describe actions to reduce energy consumption in homes.</p>
	<p>4. Consolidate the idea of machines and know the parts and operation of simple and complex machines, identifying energy transformations.</p>	<p>4.1. Name simple and compound machines, describe their parts and how they work, and forms and transformations of energy involved in the operation of the machines.</p>

<p>powered turbine and transforming chemical energy to magnetic.</p> <ul style="list-style-type: none"> • Being green. • Understanding information, learning vocabulary, using language as a tool for communication and keeping a positive attitude towards reading. • Knowledge of and use of mathematical operations and mathematical strategies to resolve problems. • Understanding social reality and showing respect towards society and nature. • Knowledge and responsible use of ICT to investigate matter. • Use strategies to process information, convert it to knowledge and apply it, participating actively in their own learning process. • Initiative and perseverance in tackling problems and defending opinions, developing attitudes of respect and collaboration when working in a group. 	5. Learn about and appreciate scientific and technological efforts and their applications that enable human progress.	5.1. Describe scientific and technological advances in housing, medicine, communication and information technology and their impact on lifestyles.
	6. Understand the phases of a project and implement them accurately.	6.1. Be actively involved in all phases of a project.
	7. Understand information, acquire vocabulary about the use of energy and machines, express knowledge and express opinions and show interest in reading texts related to energy and machines.	7.1. Understand information, acquire vocabulary about the use of energy and machines, express knowledge and express opinions orally and in writing and show interest in reading texts related to energy and machines.
	8. Know and apply mathematical operations and strategies to calculate energy consumption.	8.1. Know and apply mathematical operations and strategies to calculate energy consumption.
	9. Know and use ICT in a responsible way and use strategies to process information and apply it to different contexts, actively participating in their own learning process.	9.1. Obtain and organise information, working with the unit structure, and using digital resources with interest and responsibility.
	10. Show initiative and perseverance in tackling problems and defending opinions, developing attitudes of respect and collaboration when working together in a group.	10.1. Show initiative, accept mistakes when doing self-evaluation, persevere in reinforcement tasks and actively participates in cooperative learning exercises.

3. COMPETENCIES

COMPETENCIES	CONTENTS AND ACTIVITIES BY COMPETENCY
Linguistic competency.	Using knowledge of language structure, spelling and grammar rules to produce written texts. Write a brief explanation on how plants use sunlight. Reading the initial reading and the recommended texts in the reading plan.
Mathematical competency and basic competencies in Science and Technology.	Be aware of the changes produced by man in the natural environment and the implications for future life. Apply energy saving measures in the home and at school.
Digital competency.	Understanding messages from the media. Obtaining information from a story about the production of electricity or pollution seen in any type of media.
Learning to learn.	Showing awareness of the learning process. Reviewing what has been learned throughout the unit and the course. <i>Multiple intelligences:</i> Carrying out a project, promoting the development of different multiple intelligences, especially spatial intelligence.
Social and Civic competencies.	Engaging in or promoting actions with a social purpose. Promoting the use of public transport and reducing energy consumption. <i>Values:</i> Learning to behave correctly according to different values. Valuing the contributions of others in carrying out group work.
Sense of initiative and entrepreneurial spirit.	Having a realistic and ambitious vision of the future. Analysing the changes brought about by the development of a machine and explaining the impact that some important recent discoveries will have in the future.
Cultural awareness and expression	Appreciating the beauty of artistic expression and in everyday things. Recognising the beauty of machines and devices, such as old windmills.