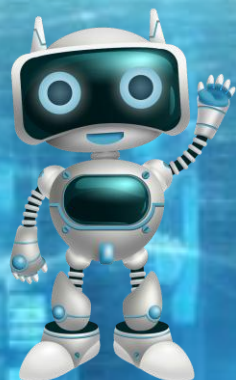


EXPLORERS

RENEWABLE OCEAN ENERGY

The Power of the Future

TEACHERS PLANNING GUIDE & LESSON PLANS



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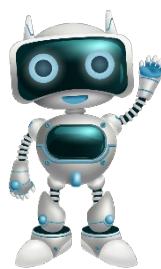
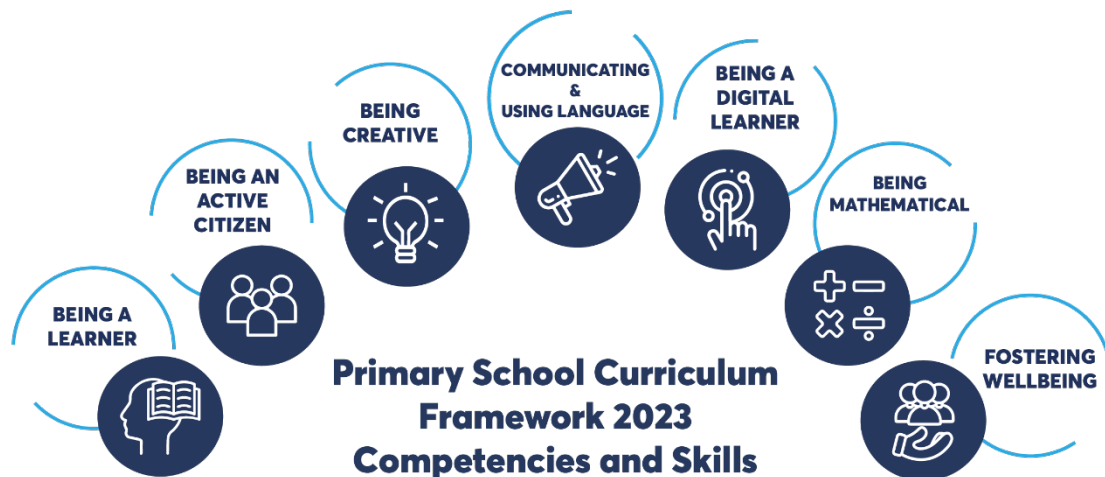
Foras na Mara
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TEACHERS PLANNING GUIDE

Dive into the dynamic world of renewable ocean energy with The Explorers Teacher's Planning Guide. Designed to inspire the next generation of innovators, this resource provides comprehensive lessons and STEAM activities that can be completed as class projects.

The lessons demystify energy, forces, and biomimicry in the context of offshore wind, tidal, and wave power. Children will learn how to track power, understand power grids, and envision smart cities powered by the ocean. Seamlessly integrated with the Irish national curriculum, STEM development, and the SDGs, this guide cultivates ocean literacy and key competencies, shaping environmentally conscious and future-ready learners.



EXPLORERS RENEWABLE OCEAN ENERGY -
THE POWER OF THE FUTURE
teaching resources are freely available to
download at www.explorers.ie



LESSON & PROJECT PLANS

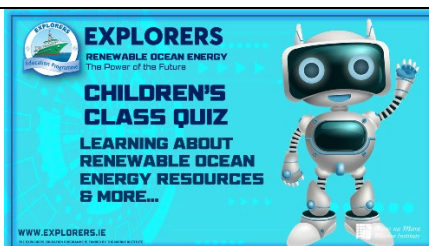


EXPLORERS RENEWABLE OCEAN ENERGY: ACTIVITIES & LESSON PLANS

Five lesson and project plans (listed below) can be used for thematic learning. They include fun cross curricular and STEM activities for the class that can be taught through thematic projects involving developing skills: creative design, communications and language, maths, being an active learner and digital learning. See the lessons table below for more information.

1. LESSON PLAN: [ENERGY IN MOTION - UNDERSTANDING ENERGY AND FORCES](#)
2. LESSON PLAN: [UNDERSTANDING ENERGY SOURCES THAT GENERATE POWER](#)
3. PROJECT / LESSON PLANS: [LEARNING ABOUT BIOMIMICRY & OCEAN ENERGY: NATURE'S BRILLIANT ENGINEERS!](#)
4. PROJECT / LESSON PLANS: [RENEWABLE OCEAN ENERGY – A STEAM EXPLORATION OF WIND, TIDE & WAVE ENERGY](#)
5. PROJECT / LESSON PLANS: [EXPLORERS OCEAN ENERGY ENGINEERS: TRACKING THE POWER AND CREATING SMART CITIES](#)

CLASS QUIZ


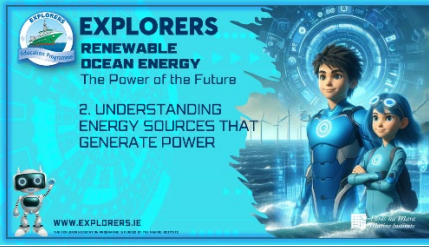




[EXPLORERS RENEWABLE OCEAN ENERGY RESOURCES – THE POWER OF THE FUTURE: CHILDREN'S CLASS QUIZ](#)

The class quiz is a great introduction to learning about energy and forces, biomimicry inspiring ocean energy devices, and offshore wind energy, tide energy and wave energy.



PRESENTATIONS

 <p>EXPLORERS RENEWABLE OCEAN ENERGY The Power of the Future</p> <p>1. UNDERSTANDING ENERGY & FORCES</p> <p>WWW.EXPLORERS.IE</p>	<p><u>EXPLORERS RENEWABLE OCEAN ENERGY - THE POWER OF THE FUTURE PRESENTATION: Chapter 1. UNDERSTANDING ENERGY AND FORCES</u></p> <p>This presentation aims to apply learning scientific concepts related to energy and forces. It introduces children to Ocean Energy - The Power of the Future new words for a wall chart & glossary.</p>
 <p>EXPLORERS RENEWABLE OCEAN ENERGY The Power of the Future</p> <p>2. UNDERSTANDING ENERGY SOURCES THAT GENERATE POWER</p> <p>WWW.EXPLORERS.IE</p>	<p><u>EXPLORERS RENEWABLE OCEAN ENERGY – THE POWER OF OUR FUTURE PRESENTATION: Chapter 2. UNDERSTANDING ENERGY SOURCES THAT GENERATE POWER</u></p> <p>This presentation aims to explore, develop, and apply scientific ideas and concepts through communication, language, math, design, and creativity. The students will learn about and understand energy sources that generate power through discussion and interactive activities.</p>
 <p>EXPLORERS RENEWABLE OCEAN ENERGY The Power of the Future</p> <p>3. LEARNING ABOUT RENEWABLE OCEAN ENERGY RESOURCES</p> <p>WWW.EXPLORERS.IE</p>	<p><u>EXPLORERS RENEWABLE OCEAN ENERGY - THE POWER OF THE FUTURE PRESENTATION: Chapter 3. LEARNING ABOUT RENEWABLE OCEAN ENERGY RESOURCES</u></p> <p>This presentation aims to explore, develop, and apply scientific ideas and concepts through design and making activities. The students will learn about mimicry and how nature inspires engineering and new inventions. The students will learn about renewable offshore, tidal, and ocean energy sources.</p>
 <p>EXPLORERS RENEWABLE OCEAN ENERGY The Power of the Future</p> <p>4. LEARNING ABOUT OUR ELECTRICAL GRID, CONSERVING ENERGY & DESIGNING A SMART CITY for the FUTURE</p> <p>WWW.EXPLORERS.IE</p>	<p><u>EXPLORERS RENEWABLE OCEAN ENERGY – THE POWER OF OUR FUTURE PRESENTATION Chapter 4: LEARNING ABOUT OUR ELECTRICAL GRID, CONSERVING ENERGY & DESIGNING A SMART CITY for the FUTURE</u></p> <p>This presentation encourages children to work together in teams to explore ideas about energy, tracking how energy reaches our homes, and how much electricity is consumed in Ireland and worldwide. The students will design pylons and build an innovative Smart City using electrical circuits that showcases the benefits of using ‘Renewable Ocean Energy—The Power of the Future’.</p>



SUMMARY OF LESSONS AND PROJECTS

The project lesson plans and activities have been designed to promote using STEAM (Science, Technology, Engineering, Arts, and Maths) in the classroom through a range of sessions that will develop children's skills: being a learner, being creative, communicating & using language, being a digital learner, and being mathematical. The time allocations are estimates and may vary depending on the class engagement and activities.

Subject / Skills	Lesson Plan	Activity	Time
Science, Languages, Arts	1. LESSON PLAN: ENERGY IN MOTION - UNDERSTANDING ENERGY AND FORCES	The lesson includes two sessions/lesson activities: <ul style="list-style-type: none"> ENERGY FOUNDATIONS & OCEAN CONNECTIONS (Word Wall Graphics) ENERGY HISTORY & TIMELINE (Infographics) Students will learn about energy and forces. They will create an interactive "Ocean Energy Words Wall graphic (A-Z)" incorporating visual representations and multilingual translations of energy words. Extra words and illustrations will be added to the wall throughout the additional sessions and activities. Students will develop a timeline infographic illustrating the history and impact of energy discoveries, focusing on electricity and ocean-related advancements.	45 min X 2 sessions
Science, Languages, Arts	2. LESSON PLAN: UNDERSTANDING ENERGY SOURCES THAT GENERATE POWER	The lesson includes two sessions/lesson activities: <ul style="list-style-type: none"> EXPLORING ENERGY SOURCES AND THEIR ORIGINS CLASS DISCUSSION, CREATION, AND COMMUNICATION (Creating Games) Students will explore and research energy sources around the world and those used in Ireland. They will then have a group discussion about the advantages and challenges of renewable and non-renewable energy resources. The class will work in teams to create a series of board or card games incorporating what they have learned about renewable and non-renewable energy resources.	45 min X 2 sessions



<p>Science, Languages, Arts, Maths,</p>	<p>3. PROJECT / LESSON PLANS: LEARNING ABOUT BIOMIMICRY & OCEAN ENERGY: NATURES BRILLIANT ENGINEERS!</p>	<p>The project plan includes five sessions/lesson activities:</p> <ul style="list-style-type: none"> • INTRODUCTION TO BIOMIMICRY AND OCEAN INSPIRATION • HUMPBACK WHALES & RENEWABLE OCEAN ENERGY DEVICES • PELAMIS SNAKES, SHARKS, AND SEAWEED: MOVEMENT AND EFFICIENCY • BIOMIMICRY DESIGN CHALLENGE: DESIGN & CREATE AN OCEAN ENERGY DEVICE • PRESENTATIONS & EVALUATION <p>Students will explore, develop, and apply scientific ideas and concepts through design and making activities. The students will identify areas around the world suitable for harnessing ocean energy. They will learn about offshore wind energy, turbines, and platforms at sea. They will study the history of tidal and water energy in the Middle Ages, where millers used devices for milling. The students will also learn about wave energy and innovative designs through bio-mimicry and set out to design their own devices based on their favourite ocean animals/seaweeds, etc. As a class, they will discuss and analyse the challenges and opportunities of ocean energy.</p>	<p>45 min X 5 sessions</p>
<p>Science, Geography, History, Languages, Arts, Maths,</p>	<p>4. PROJECT / LESSON PLANS: RENEWABLE OCEAN ENERGY – A STEAM EXPLORATION OF WIND, TIDE & WAVE ENERGY</p>	<p>The project plan includes four sessions/lesson activities:</p> <ul style="list-style-type: none"> • MAPPING OCEAN ENERGY POTENTIAL • TIDAL ENERGY - FROM ANCIENT MILLS TO MODERN TURBINES (construction) • OFFSHORE WIND ENERGY - DESIGN AND ENGINEERING (infographics) • WAVE POWER - HARNESSING THE OCEAN'S MOTION (dioramas). <p>Students will learn about the availability of ocean energy by reviewing maps of wave energy around the world. They will discuss the different types of ocean energy devices.</p>	<p>45-60 min X 4 sessions</p>



		<p>The students will focus on learning about offshore wind turbines by constructing their own pinwheels and turbines. The students will consider the platforms offshore wind energy requires (fixed and floating). The students may also create interactive infographics showing offshore wind energy devices and platforms.</p> <p>The next session will cover learning about tidal energy devices, from ancient mills to modern innovative ideas for tidal and wave turbines. The students will also focus on wave power—harnessing the ocean's motion—and develop an understanding of waves and how they form. Following these activities, the students will create dioramas showcasing different wave energy devices and their operations.</p>	
<p>Science, Geography Languages, Arts, Maths,</p>	<p>5. PROJECT / LESSON PLANS: EXPLORERS OCEAN ENERGY ENGINEERS: TRACKING THE POWER AND CREATING SMART CITIES</p>	<p>The project plan includes four sessions/lesson activities:</p> <ul style="list-style-type: none"> • TRACKING THE POWER - FROM SOURCE TO HOME • PYLON POWER - DESIGNING THE INFRASTRUCTURE & LEARNING ABOUT ENERGY CONSUMPTION • BUILDING THE SMART OCEAN CITY USING RENEWABLE OCEAN ENERGY RESOURCES • PRESENTATIONS & EVALUATION. <p>Students are "Ocean Energy Engineers" on a mission to save the planet by developing sustainable ocean energy devices, pylons, and renewable ocean energy solutions for a smart city. They will learn about the national grid system and the importance of infrastructure that enables everyone to have electric power. They will also learn about pylons and energy consumption in our homes. As a more extensive project, the students will design and build smart cities, considering how their cities can run on renewable energy sources around Ireland.</p>	<p>45-60 min X 4 sessions</p>



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NOTES PAGE

