



**Middle Level**

# **Energy from Waves & Tides**

A Lesson Plan Featuring **Britannica  
LaunchPacks**

# Lesson Overview

<b>Subject</b>	Energy from Waves and Tides
<b>Level</b>	Middle
<b>Duration</b>	5-6 Class Periods of 45 minutes
<b>Description/Aim</b>	Students investigate how the ocean is a source of renewable energy.
<b>Materials</b>	<ul style="list-style-type: none"><li>• Internet Connection</li><li>• Access to '<b>Ocean Waves &amp; Tide</b>' Years 6-8 from <b>Britannica LaunchPacks</b> ↗</li><li>• Scientific Equipment (see Procedures)</li><li>• Various Worksheets (included)</li></ul>

## Lesson Objectives

- Gain a better understanding of global issues
- Identify current key issues that exist within the climate change problem
- Find new meaning through the information they discover
- Share their learning with their local community and the wider world



This lesson refers to content and tools found in the "Ocean Waves & Tide" Pack from **Britannica LaunchPacks: Science**. Contact your librarian to find out if your school already has access. **Visit [elearn.eb.com](https://www.elearn.eb.com) to learn more about Britannica LaunchPacks or set up a free trial.**

## Lesson Background

# Energy from Waves & Tides

In 2015, world leaders agreed to 17 goals for a better world by 2030. The United Nations Sustainable Development Goals, as they are known, address global challenges like poverty, inequality and climate change and serve as a blueprint to a more sustainable future.

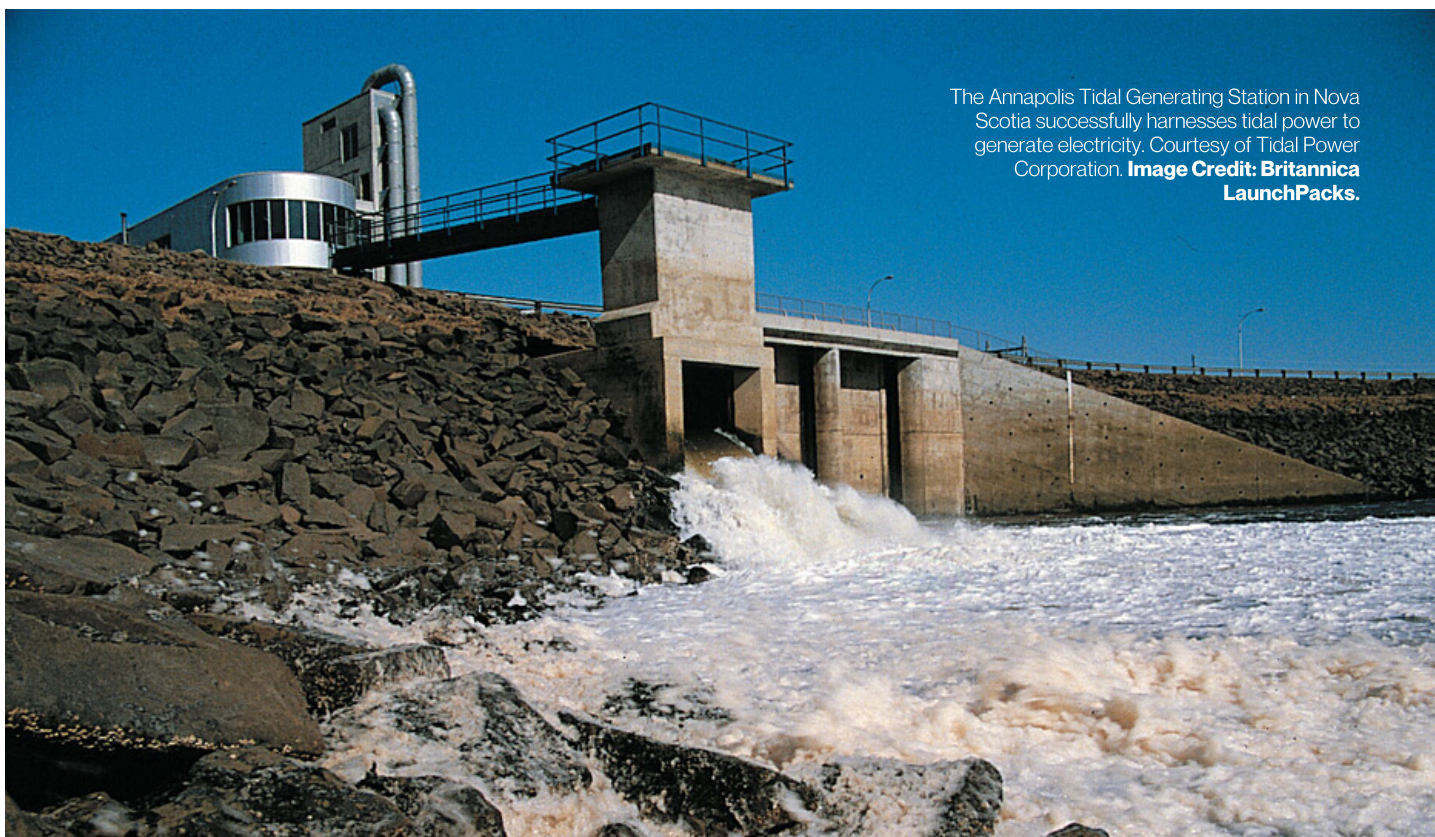
As a global education leader, working to support students in becoming lifelong learners and citizens of the world, Britannica educators have partnered with the United Nations Global Goals to call upon schools, educators and students to amplify, reflect and act on these challenges that affect every one of us.

The following lesson will teach students about the responsible stewardship of our oceans by investigating how waves and tides can be harnessed to provide a renewable source of energy.

It will lead students towards deeper connections, understanding and ultimately action.

As the call for sustainable change grows around the world, ensure that your students are informed, engaged and prepared to tackle one of the most important issues facing their generation.

**This lesson supports UN Sustainable Development Goal 14: Life Below Water, which aims to conserve and sustainably use the oceans, seas and marine resources for sustainable development.**



The Annapolis Tidal Generating Station in Nova Scotia successfully harnesses tidal power to generate electricity. Courtesy of Tidal Power Corporation. **Image Credit: Britannica LaunchPacks.**

# Step-by-Step Procedures

## 1. Types of Ocean Energy

Wave energy and tidal energy form Ocean Energy. Watch the **'Wave Energy' video** and read the **'Water Power' article** found in the **'Ocean Waves & Tide' LaunchPack**.



Use the information to complete a Main Idea and Detail table for each type of energy.

 [Main Idea and Detail worksheet \[PDF\]](#)



Ocean Waves and Tides

*This Pack contains:*

-  4 Articles
-  4 Images
-  2 Videos

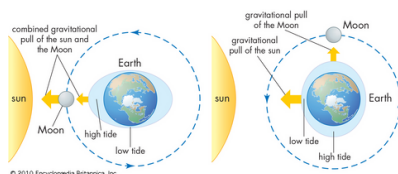


## 2. Tides

Watch the **'Tide' video**, examine the **'Tide' image** and read the **'Tide' article**, all found in the 'Ocean Waves & Tide' LaunchPack.

Explain how high and low tides are formed using the Cause and Effect worksheet.

 [Cause and Effect worksheet \[PDF\]](#)



## Practical Activity: Making Waves

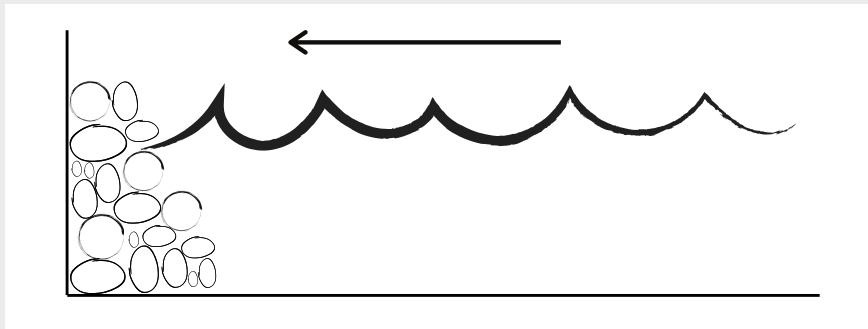
First read the **'Waves' article** from the 'Ocean Waves & Tide' LaunchPack. Then follow the steps below to complete a wave-making investigation.

### Equipment:

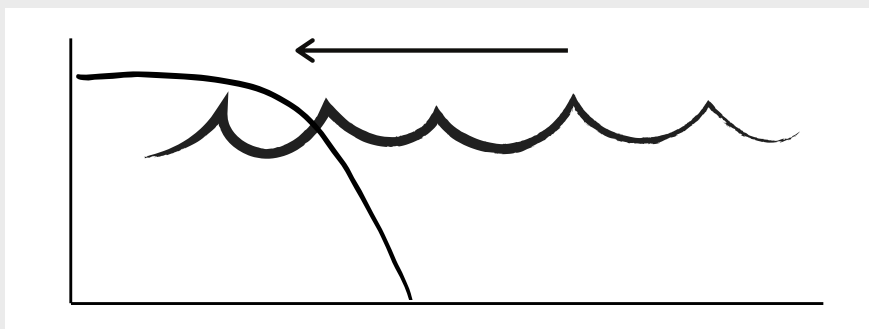
- Baking tray
- Sand
- Handful of stones
- Water
- Flat board of wood/plastic

**Steps:**

1. In small groups, fill the baking tray with 6cm of water.
2. Place the board at an angle in one end of the tray and move it back and forth to create a wave.
3. Count how many times the wave moves back and forth across the tray before it disappears.
4. Place a handful of stones at one of the tray, ensure the stone pile is higher than the top of the water and there is a seaward slope in the stones. See Diagram 1.

**Diagram 1**

5. Create a wave using the board that reflects off the stones. Count how many times the wave moves back and forth across the tray before it disappears.
6. Replace the stones with sand, ensure the sand is higher than the top of the water and there is a seaward slope. See Diagram 2.

**Diagram 2**

7. Create a wave using the board that reflects off the sand. Count how many times the wave moves back and forth across the tray before it disappears.

**Wrap Up:**

- Were the differences in the waves without stones/sand and with stones and sand? Explain
- Predict what would happen if there was island in the centre of the tray?

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Adapted from MESA, "Wave Experiments", Marine Education Society of Australasia  
<http://www.mesa.edu.au/cams/pdf/waves.pdf>, last accessed 08 July 2020

## Assessment

- Various annotated work samples such as Cause and Effect chart or the Wave Investigation task.
- Observation of the students participating in the lesson and their contribution to group discussions.

# About Us

For over 250 years Encyclopaedia Britannica has reimaged how the world discovers.

Today, Britannica Digital Learning is partnering with global education leaders to ensure a new generation of learners can engage more deeply with the world around them. Combining curiosity with curriculum, our resources and solutions have helped schools around the world leverage technology creatively so that every student is challenged, empowered and engaged to learn.

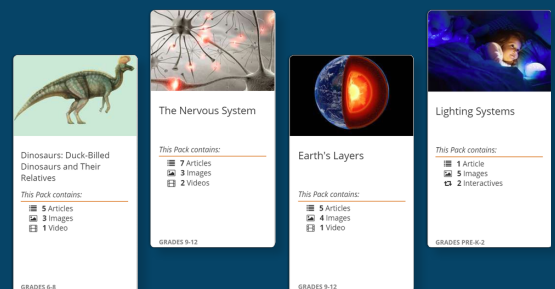
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## About LaunchPacks

Britannica LaunchPacks gives educators the tools and content they need to build differentiated learning experiences around thousands of K-12 curriculum topics.

Each LaunchPack is topic focused and contains a collection of related multimedia content compiled by our teachers and experts. Featuring powerful customisation options, third party integrations and a variety of scaffolding activities to choose from, LaunchPacks can be used just as they are, or easily customised to fit the unique needs of your class.

LaunchPacks are available for Science and HASS subjects.



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