



Exploring the Deep Ocean with NOAA Ocean Exploration Educator Resource List

To Boldly Go - Lesson

- **Educator Guide:** <https://oceanexplorer.noaa.gov/edu/materials/to-boldly-go.pdf>
- **Student Worksheet:** <https://oceanexplorer.noaa.gov/edu/materials/to-boldly-go-student-worksheet.pdf>

Fact Sheet

- **Why Do We Explore?** <https://oceanexplorer.noaa.gov/edu/materials/why-do-we-explore-fact-sheet.pdf>

Wet Maps - Lesson

- **Educator Guides:** <https://oceanexplorer.noaa.gov/edu/materials/wetmaps.pdf>
- **Student Worksheet:** <https://oceanexplorer.noaa.gov/edu/materials/wetmaps-student-worksheet.pdf>

Fact Sheets - These fact sheets can also be used with the Watching in 3D lesson below.

- **Bathymetric Maps:** <https://oceanexplorer.noaa.gov/edu/materials/bathymetric-mapping-fact-sheet.pdf>
- **Seeing Sonar with Sound:** <https://oceanexplorer.noaa.gov/edu/materials/sonar-fact-sheet.pdf>
- **Multibeam Sonar:** <https://oceanexplorer.noaa.gov/edu/materials/multibeam-sonar-fact-sheet.pdf>

Sound to Map the Seafloor (Video):

<https://oceanexplorer.noaa.gov/edu/multimedia-resources/dsd/media/2023-DSD-Mapping-v6-1920x1080.mp4>

Watching in 3D: Exploring with Multibeam Sonar - Lesson

- **Educator Guide:** <https://oceanexplorer.noaa.gov/edu/materials/Watching3Dinstructions.pdf>
- **Case Study 1: Exploring an Underwater Volcano (Kawio Barat)**
https://oceanexplorer.noaa.gov/edu/materials/CaseStudy1_KawioBarat_Volcano.pdf
- **Introduction Video:** https://oceanexplorer.noaa.gov/edu/materials/Win3D_Fledermaus.mp4
- **Fledermaus Video: Underwater Volcano (Kawio Barat)**
https://oceanexplorer.noaa.gov/edu/materials/CaseStudy1_KawioBarat_Volcano.mp4
- **All other case studies and videos**
<https://oceanexplorer.noaa.gov/edu/themes/seafloor-mapping/lessons/3d-multibeam-sonar.html>

Fact Sheets

- **All the above listed mapping fact sheets plus the following additions:**
- **Cold Seeps:**
 - **English:** <https://oceanexplorer.noaa.gov/edu/materials/what-are-cold-seeps-fact-sheet.pdf>
 - **Spanish:** <https://oceanexplorer.noaa.gov/edu/materials/what-are-cold-seeps-fact-sheet-ESP.pdf>
- **What is a Seamount?**
 - **English:** <https://oceanexplorer.noaa.gov/edu/materials/what-is-a-seamount-fact-sheet.pdf>
 - **Spanish:** <https://oceanexplorer.noaa.gov/edu/materials/what-is-a-seamount-fact-sheet-ESP.pdf>

Using Chemistry to Find Vents - Lesson

- **Educator Guide:** <https://oceanexplorer.noaa.gov/edu/materials/investigation-using-chemistry-to-find-vents.pdf>
- **Student Worksheet:**
<https://oceanexplorer.noaa.gov/edu/materials/investigation-using-chemistry-to-find-vents-student-worksheet.pdf>

Hydrothermal Vents (Video):

<https://oceanexplorer.noaa.gov/edu/multimedia-resources/dsd/media/hydrothermal-vents-1920x1080.mp4>

Fact Sheets

- **Hydrothermal Vents:**
 - **English:** <https://oceanexplorer.noaa.gov/edu/materials/hydrothermal-vents-fact-sheet.pdf>
 - **Spanish:** <https://oceanexplorer.noaa.gov/edu/materials/hydrothermal-vents-fact-sheet-ESP.pdf>
- **Chemosynthesis:**
 - **English:** <https://oceanexplorer.noaa.gov/edu/materials/chemosynthesis-fact-sheet.pdf>
 - **Spanish:** <https://oceanexplorer.noaa.gov/edu/materials/hydrothermal-vents-fact-sheet-ESP.pdf>
- **Making Sense of Deep-Sea Phenomena:**
<https://oceanexplorer.noaa.gov/edu/materials/NOAA-NSTA-sensemaking-phenomenon.pdf>

Simple Machines: Robot Building Blocks - Lesson

- **Educator Guide:** <https://oceanexplorer.noaa.gov/edu/materials/simple-machines-activity.pdf>
- **Student: Simple Machines:** <https://oceanexplorer.noaa.gov/edu/materials/simple-machines-handout.pdf>
- **Engineering Design:** <https://oceanexplorer.noaa.gov/edu/materials/engineering-design-process-handout.pdf>
- **Supplemental Resources**
 - [Which Robot When](#) - NOAA Ocean Exploration Lesson
 - [Give Hercules a Helping Claw](#) - OET STEM Learning Module
 - [Robotic Arm Kit Activity](#) - OET design challenge

Underwater Robots: <https://oceanexplorer.noaa.gov/edu/multimedia-resources/dsd/media/robots-1920x1080.mp4>

Fact Sheets

- **Remotely Operated Vehicles:**
 - **English:** <https://oceanexplorer.noaa.gov/edu/materials/rov-fact-sheet.pdf>
 - **Spanish:** <https://oceanexplorer.noaa.gov/edu/materials/rov-fact-sheet-ESP.pdf>
- **Autonomous Underwater Vehicles:**
 - **English:** <https://oceanexplorer.noaa.gov/edu/materials/auv-fact-sheet.pdf>
 - **Spanish:** <https://oceanexplorer.noaa.gov/edu/materials/auv-fact-sheet-ESP.pdf>

Additional Resources

- **Ocean Literacy:** <https://www.marine-ed.org/ocean-literacy/overview>
 - **Ocean Literacy Guide:** <https://www.marine-ed.org/ocean-literacy/guide>
 - **Ocean Literacy Handbook:** <https://www.marine-ed.org/ocean-literacy/handbook>
- **NOAA Ocean Exploration:** <https://oceanexplorer.noaa.gov/edu/themes/welcome.html>
 - **Ocean Exploration Education Fact Sheets:** <https://oceanexplorer.noaa.gov/edu/materials/fact-sheets.html>
 - **Deep-Sea Dialogues:** <https://oceanexplorer.noaa.gov/edu/multimedia-resources/dsd/dsd.html>

- **Seafloor Mapping with NOAA Ocean Exploration:**
<https://storymaps.arcgis.com/stories/0e846463c4a84c94bb0dfc594201b249>
- **Deep Ocean Education Project (website):** <https://deepoceaneducation.org/>