

Annotated list of resources for elementary grades (2-5) science:

Ocean Principle 1: The Earth has one big Ocean with many features

Activity: [This is a great activity](#) to highlight the one world ocean, introduce currents, and bring in some supporting geography. This activity also asks students to use graphing and mathematical/computational skills to support their claims. Appropriate for 2nd grade (2-ESS2-2 Maps show where things are located. One can map the shapes and kinds of land and water in any area, 2-ESS2-3 Water is found in the ocean, rivers, lakes, and ponds. Water exists as solid ice and in liquid form) or 5th grade (5-ESS2-2 Nearly all of Earth's available water is in the ocean. Most freshwater is in glaciers or underground; only a tiny fraction is in streams, lakes, wetlands, and the atmosphere).

Interactive Resource: [JetStream Max: Major Ocean Currents](#) is an interactive map that can help students visualize the different currents. If you would like to have your students explore this, share the link with them, along with the information in the following table that includes the currents associated with each gyre, and in different parts of the ocean. Students can check the specific currents to see where the water in the gyre is warm and where it is cold, so they can look for patterns in both the temperature and direction of the water.

STEAM challenges: [Great challenges exploring](#) some of the unique properties of salt water. This resource has some great ideas for more open ended, inquiry based labs looking at desalination, density, and solubility of salt water. These challenges would be appropriate for K-5th grade and align with many of the NGSS Science and Engineering Processes such as planning and carrying out investigations, obtaining and evaluating information, and modeling.

Ocean Principle 2: The ocean and life in the ocean 2 shape the features of Earth

Activity: A [great introduction to sand](#) and many different things found in the sand. Students are given free exploration to "dig" into the sand to discover different rocks/abiotic samples, evidence of biotic samples, and human trash. Students can be led in different discussions about the materials found in the sand buckets or discoveries can be left more open-ended and revisited as additional labs/activities are completed. This is appropriate and can be modified for Kindergarten-5th grade.

Lab: A [great follow up](#) to the previous activity would be to take a closer look at sand samples. This Lab has students using hand lenses to explore the shape and size of grains but I have also done something similar with microscopes and had students bring sand samples from different beaches around the world.

Video resources: A selection of amazing videos from NOAA about ocean floor features. [Deep Ocean Volcanoes](#)

[Underwater Vents and Volcanoes](#)

[Underwater Volcanoes](#)

[Ocean Floor Relief Maps](#)

[Life on a Vent](#)

[The Depths Below: The Ring of Fire](#)

Ocean Principle 3: The ocean is a major influence on weather and climate

Lab: [This lesson](#) helps students explore the role of the ocean in climate through an investigation of how hot and cold water behaves. The lab activity is set up as a demonstration but would be appropriate to do as a student-led experiment in grades 3-5. There is a clear graphic on p. 40 that would be very helpful for students to see as they analyze their observations. Students examine temperature and precipitation data from two cities and use their understanding of water movement to explain why these cities have differences between their temperatures and rainfall.

STEAM activity: [This is a great activity](#) for students to practice the skill of developing a working model and modifying that model based on new evidence. It also provides students with time and guidance to draw scientific diagrams. Students are challenged to use scientific drawings to understand how water moves in the ocean and the impacts of that movement. Students will explain how changes to a major ocean current would impact the Earth.

Resource: [Climate resilience in your community](#) activity book was designed for learners in grades 3-8 for use in formal and informal educational settings. Each of the six sections of the book mirrors key concepts from the NOAA Environmental Literacy Program's [Theory of Change](#) to help learners identify ways to build resilience to climate change in their own communities. The end of the book includes additional activities and resources.

Ocean Principle 5: The ocean supports a great diversity of life and ecosystems

Activity: [This is a great hands-on lesson](#) that could be used in 2nd grade (2-LS4-1 There are many different kinds of living things in any area, and they exist in different places on land and in water) or 3rd grade (3-LS4-4 Populations live in a variety of habitats, and change in those habitats affects the organisms living there) to highlight the biodiversity of life in the ocean. This is a great lesson to introduce biodiversity in the ocean or as a wrap up lesson at the end of a unit. With minimal prep, this high student interest activity has students working together to sort different ocean animals based on habitat and energy sources. Students are also tasked with explaining with evidence why they placed their ocean organism in each place - pulling in the CCC of argument from evidence. Students are creating a working model of ocean habitats - supporting the SEP of modeling.

Student Research Project: Have students choose a plant or animal that lives in the ocean and do research to describe it, list what it eats and what eats it, and how deep in the ocean it lives. Discuss the diversity, or the many kinds of plants and animals that live in the ocean. Some NOAA resources that teachers may use to guide their student's research include the following.

[Marine Life Resource Collections](#)

[Regional Activity Books](#)

[National Marine Sanctuaries Resources](#)

[Estuary Education Resources](#)

Virtual Field Trips: [Here are a list of virtual field trips](#) to show students the amazing biodiversity of the ocean. Some of the listed aquariums require registration while others provide any time access to various cams such as Indo-Pacific Barrier Reef Webcam, Ocean Voyager Webcam, Jelly Webcam, Open Sea Cam, Monterey Bay Cam, and even a Shark Cam.

Ocean Principle 6: The ocean and humans are 6 inextricably interconnected

Activity: Students take a critical look at the fishing industry [in this activity](#). Students collaborate in teams to learn about different fishing methods and the relevant constraints and criteria for each method. Based on small group discussion and analysis of information gathered, students make a recommendation about the best fishing methods, then watch a video about American Samoa to learn how this community uses responsible and sustainable fishing methods to support the people who live there.

Student research project: A [nice guide](#) to help teachers guide students through an independent/small group research project of their choice looking at human impacts on the ocean. The website provides nice resources such as this helpful [research guide](#) and [video series](#) looking at the altered ocean.

Art (STEAM) project/contest: [The NOAA Marine Debris Program holds an annual art contest](#) to reach K-8 students and help raise awareness about marine debris. Art must represent how marine debris impacts the ocean and the Great Lakes environment and what the student is doing to help prevent marine debris. Examples from previous entries can be found [here](#). Some background information about marine debris can be found [here](#).