Cross-Curricular Activities Connected to Earth Science, Grade 2

The following activities from ***Earth Materials,*** integrate math, social studies, English Language Arts (ELA), art, and more into earth science topics. These cross-curricular connections help students see how science is related to their lives, and the world they live in. These activities reinforce and extend ideas about geological events and the history of Earth and are perfect for learning-from-home lesson plans. Permission is granted to incorporate these activities into teacher and parent lesson plans.

Bodies of Water (Geography)

Share a world map or a globe with the class, and challenge students to find as many bodies of water as possible. They should list these in their science notebooks. Encourage students to draw a map or a labeled drawing of the bodies of water and landforms found in your area.

Water Poetry (ELA)

Concrete poems are poems that have the words arranged in a way that is representative of the poem's topic. As a class, write a concrete poem about water. You might arrange the words of the poem in the shape of a cloud, a raindrop, or a river.

Challenge students to create haikus, which are three-line poems about nature that have five syllables in the first line, seven syllables in the second line, and five syllables in the third line.

Publish the class poems by posting them on a classroom or hallway wall or bulletin board.

Water Fractions (Math)

Give each student a sheet of paper, and direct them to cut it into three equal parts. Ask:

- How many of these pieces of paper would represent water? (2 of the 3 pieces)
- What should we color them? (Blue)
- What does the one piece of paper you have left represent? (Land)
- What color would you color it? (Green or brown)
- How many thirds does it take to make one whole piece of paper? (3)

Encourage students to manipulate the pieces they colored to make one whole piece of paper. Then motivate students to think further by asking:

- How many thirds represent land? (1)
- How many thirds represent water? (2)
- How many more thirds does it take to represent water than land? (1)
- How many thirds does it take to represent one whole? (Students should conclude that it takes three thirds to make a whole.)

Stone Soup Classroom Collection: Stone Stories and Poems (Literacy)

Obtain a copy of Stone Soup by Marcia Brown. Read the story with the class. Discuss the story and the moral with students. Invite the class to work together to create a book of poems, stories, and recipes for stone soup. Encourage students to use adjectives, sensory images, and descriptive language to create poems, fables, legends, jokes, dialogue, and recipes about stones and rocks. Allow students to illustrate their creative writing. To spark creativity, you might use some or all of the following prompts:

- Imagine what flavor each type of rock or stone (igneous, sedimentary, metamorphic) would have. How would the different rocks feel on your tongue? Might one be fizzier than others? (Remind students that they are using their imaginations only and are not placing stones or rocks in their mouths.)
- If you had a recipe for stone soup, what unique ingredients would it include?
- What conversation would two stones have if they could talk?
- What fable, tall tale, or legend of stones would you write?

If available, you might schedule computer access for students to write, edit, and illustrate their work or to make an audio recording. Upon completion, invite parents and schoolmates to your classroom for an unveiling of the students' literary works.

Observe a Rock Collection (Geology and Math)

Place one of the Rock Study Kits, some hand lenses, and the rocks that students collected during the Take-Home Science Activity in a learning center so students can continue to reinforce their learning about the physical properties of their rocks. If a balance is available, encourage students to sort the rocks by weight. You might want to have rulers and tape measures available so students can measure rocks. Direct students to record any measurements they choose to take in their science notebooks. If possible, take a trip to a local museum to view rock and mineral specimens, or invite a geologist or rock collector to share a collection with the class.

Pebble Math and Mosaics (Math and Art)

Have students collect small pebbles and large pieces of gravel outdoors. Rinse, clean, and dry the stones. Students may work individually or in pairs to use white glue to attach the pebbles in mosaic patterns or patterns from tangram cards to small, cardboard rectangles. You might also challenge students to create different geometric shapes, including triangles, quadrilaterals, pentagons, hexagons, and cubes.

Once students have explored some of the many possibilities, provide markers and additional cardboard rectangles and pebbles. Write the following number sentence on the board:

3 rows of pebbles with 4 pebbles in each row = n (number of pebbles)

Have students create this array (n = 12) using the cardboard and pebbles, drawing the array lines if they choose. Then have student pairs create a similar problem using a number (up to 25) of their choosing. Have pairs exchange number sentences and create the arrays.

Scratch That Rock: Testing Rocks for Hardness (Science)

Provide small groups of students with rocks from the class Rock Museum or the Rock Study Kits. Include a variety of rock types, including igneous, sedimentary, and metamorphic. With the rock collections, make available 3-inch nails. Instruct students to choose three rocks and to test the hardness of each by scratching the rock samples with the nail. If the nail does not leave a scratch, the rock is considered hard.

Direct students to record their results in their science notebooks and then share their results with the class. Create a class list of rocks and their hardness. You might choose to share the Mohs Scale of Hardness for Minerals with the class.

After discussing class findings, challenge students to research which rocks or minerals are suited for specific purposes based on their hardness.

Sand and Sandpaper (Art)

Allow students to explore sandpaper, and then to create their own. Bring in a variety of sandpapers, from very fine to coarse. Gather an assortment of materials, such as twigs and branches, painted and untreated wood scraps, foam shapes, cardboard tubes, etc. Encourage students to explore the different textures of the sandpaper and to use it to transform the materials provided.

To help students create their own sandpaper, provide butcher paper, white glue, and different types of dry sand. Challenge students to use these materials to create their own sandpaper. They can present their final products to the class.

Weighing Sand (Math)

Provide students with two cups, each containing the same amount of sand. The sand in one cup should be wet; in the other, the sand should be dry. Using a balance scale and nonstandard units of measure such as marbles or dry beans, challenge students to find the weight of each cup of sand (e.g., wet sand weighs 16 marbles; dry sand weighs 12 marbles, etc.). Ask:

- How much does each cup weigh?
- Which weighs more?
- How much more?

After exploration and discussion, have students create a picture graph and a bar graph to explain their findings. Then, have students create a simple word problem from the information in their graph to share with a partner.

A Grain of Sand (ELA)

Find microscope images of sand to share with students. Encourage students to think about how small the grains of sand are that we can see with our eyes, and then explain that these images are grains of sand that have been magnified many times. As you show students the images, ask them to suggest adjectives and descriptive phrases for each image, and record students' ideas on the board or chart paper. Before moving on to the next image, read the list of adjectives aloud to students. Encourage students to create a poem or haiku about their sand images.

Making Sandcastles (Engineering and Math)

Show students images or videos of sandcastle competitions. Challenge students to investigate with water and sand to find the best ratio for building a sandcastle. Have them mix a measured amount of sand (1 cupful, 1 pail, etc.) with a measured amount of water (such as 1 spoonful, ¼ cup, ½ cup, ½ pail, etc.), and then try to build a sandcastle with the wet sand. Students may need to try different combinations of sand and water. Ask:

- How much water plus sand makes the best building material? Why do you think so?
- What happens if the sand is too wet?
- What happens if the sand is too dry?

Once students have found a good proportion of water to sand, provide containers in different geometric shapes and sizes (e.g., cones/ funnels, round/oblong, square/rectangular etc.). Challenge students to create and name as many geometric shapes out of sand as they can.

Soil Settling Jar (ELA and Art)

Have students continue to explore their local soil by creating a soil settling jar. Fill a large, clear jar about one-third of the way with your local soil. Fill the jar the rest of the way with water and secure the lid. Allow the jar to sit undisturbed for 24 hours. The various components of soil will settle, or sink, at different rates and form layers based on the density, size, shape, and composition of the particles. Depending on the soil sample you collect for the settling jar, you can expect the components of your local soil to settle out in different ways. Allow students to stir the contents of the jar periodically and observe what happens so they reach the understanding that each type of material follows a pattern as it sinks to the bottom of the container. Have students record their observations in words and drawings in their science notebooks.

Which Grows Better? (Science and Math)

Plant three pots of the same kinds of seeds (radish, beans, and peas are quick growers). Plant one in sand, one in pebbles, and one in soil. As a class, make predictions about which material will allow the plant to grow the tallest. Set up the pots side by side with the same amount of light. Make sure to water the pots with the same amount of water. Have students periodically estimate the height of the plants and measure them. Encourage students to make a graph showing the different heights of the plants as they grow.

Collecting Soil Creatures (Literacy, Art, and Science)

Visit the schoolyard to explore things that live in and on the soil. Before exploring, read Life in a Bucket of Soil by Alvin and Virginia Silverstein aloud to the class. Point out the illustrations and visuals to students. After reading the book, ask students to predict what they will find in their buckets of soil.

Provide plenty of buckets and shovels for collecting. Once you get back to the classroom, place the buckets with soil on tables covered with newspaper. Allow plenty of time for the class to explore the soil they collected. They are likely to find earthworms and other creatures. If so, have them create a habitat in the classroom. Be sure to provide water. Let students make observations for several days, and then return all living things to where you found them.

Landform Excursion (Geography and Social Studies)

Place a relief globe or a relief map of the U. S. in a learning center with a variety of state and local maps. Provide graph paper or plain paper and a variety of crayons and colored pencils. Encourage students to create a map of your local area that includes as many landforms and bodies of water as they have observed in your area. Make sure they label the map.

Who Takes Care of Our Land? (Social Studies)

Invite the school groundskeeper, a forest ranger, a master gardener, a county extension representative, a conservation scientist, or a farmer to talk to your class about how they take care of the land. Students should think of questions to ask each guest that comes to class, such as:

- What skills, tools, technology, and equipment do you use?
- What training do you need to do your job?
- What solutions have you found to slow the effects of erosion on the land?

Create a class list of careers and jobs people have that relate to land and water. Add to the list any solutions the guests may have about slowing the effects of erosion.

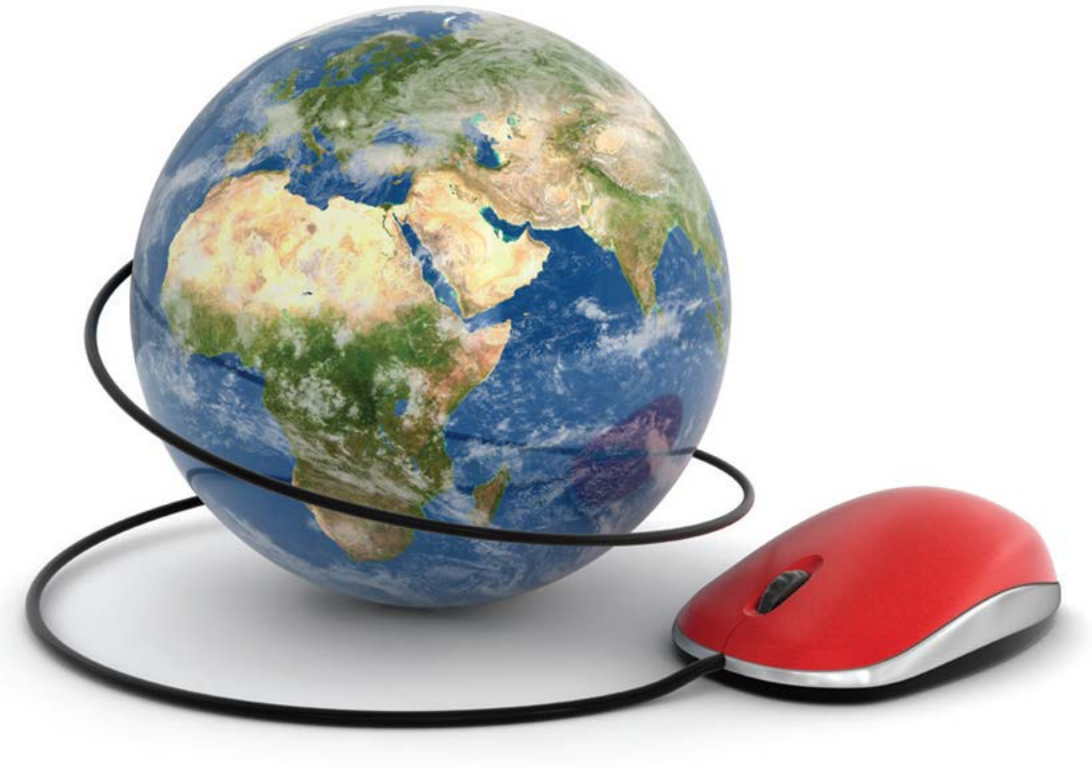
Landform Math (Math)

Challenge student pairs with the following story problems.

Brent and Stella were reviewing landforms and bodies of water on a globe. They counted four oceans, six mountain ranges, three deserts, ten rivers, five lakes, and two canyons. How many bodies of water and landforms did they count in all? How many more bodies of water did they count than landforms? (You might encourage students to use symbols or drawings to solve the problems. Students should add the number of landforms [6 + 3 + 2 = 11] and the number of bodies of water [4 + 10 + 5 = 19], and add those two numbers together [19 + 11 = 30]. To solve the second problem, students should subtract the number of landforms from the number of bodies of water [19 - 11 = 8].)

Exploring Google Earth (Geography)

Google Earth offers a variety of interesting videos and virtual field trips for students. This is a great way to show students landforms that are outside of your local area. Google has great instructional videos and tutorials about what is available if you choose to incorporate Google Earth in your curriculum.



Graphing Landforms (Math)

Have students identify the different landforms that are represented in the models they designed, and then count the number of each category represented.

Encourage students to count each landform by twos using mental math. In small groups, have students create a picture graph or bar graph of all the landforms found in the models, and then make comparisons. Are there more mountains than hills? More rivers than lakes? Which features do you see most? Which do you see the least? Have student groups present their graphs and comparison findings to the class.

My Island Story (ELA)

Once students have completed their model islands, have them write a fictional story about the island. Remind students that a story has a beginning, a middle, and an end. Make sure that there are characters in the story as well. The island or animals can be characters! Students should name their island, and in their stories, they might want to explain how the island got its name. Prompt them to make sure their stories include a relationship between the land and water. Challenge students to include a possible solution to erosion wearing away landforms. Students should create a final draft, and then showcase each story with the model islands.

Lots of Landforms (Science)

At a learning center, make available a variety of materials such as sand and gravel, any additional dough, and some heavy-duty, wide rimmed, disposable plates. Encourage students to create a variety of landforms, including rock formations or mountains and valleys. You might place the Land and Water Card Set in the learning center for reference.

Exploring the Origin of Islands (Science and ELA)

As a class, read An Island Grows by Lola M. Schaefer and Island: A Story of the Galapagos by Jason Chin. Each beautifully illustrated text explains the origins of islands as well as how animals and certain plants came to populate islands in various parts of the world. After reading, have students find the Galapagos Islands on a world map or globe and identify the ocean that surrounds it. Discuss how the illustrations and diagrams were helpful in understanding the text. Then create a T-chart or Venn diagram of the similarities and differences between the two books.

Facilitate a class discussion about how scientists can use the information from the "clues" and "mysteries" in the text to lessen the effects of erosion on the land. Have small groups act like scientists and design a solution to one of the "mysteries" in the book. Ask them to think how they could use technology and knowledge to find a solution.