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Dear Teacher,

The Division of Mathematics, Science, and Advanced Academic Programs is providing you with a packet that contains activities to use with your students during the weeks of April preceding Earth Day, which is celebrated on Saturday, April 22, 2017. Since Earth Day falls on a Saturday, we will begin Earth Day celebrations on Friday, April 21, 2017 with a live twitter chat at 1 p.m. #MDCPSEarthDay.

A list of Next Generation Sunshine State Standards addressed by the activities in this packet is provided on page 1 for Primary and page 18 for Intermediate. A list of websites is also included in the Resource Section to provide additional resources to complement or supplement classroom activities.

Miami-Dade County Public Schools wants to ensure that our students, parents, and staff remember to appreciate nature and learn ways to help keep the planet clean and protect our environment!

**History of Earth Day**

It is believed by many that Santa Barbara, California, is the birthplace of the modern environmental movement. Following the disastrous oil spill in 1969 off the coast of Santa Barbara, worldwide attention was placed on the need to protect our fragile ecosystem. In fact, it was following a visit to the oil-drenched Santa Barbara Channel and shoreline that national leaders conceived the first Earth Day event.

In 1970, the first efforts were made for a nationwide demonstration of concern for the environment. As twenty million people joined in the first ever Earth Day, attention was achieved at the political level. Due to the apparent concern, the federal government established the EPA (Environmental Protection Agency) and passed the Clean Water and Clean Air Acts. Earth Day was born and has spread around the world to become an annual international celebration on April 22nd. Information on the history of Earth day can be viewed on Earth Day homepage at: [https://www.epa.gov/earthday](https://www.epa.gov/earthday)

MDCPS Earth day resources can be accessed at [http://science.dadeschools.net/earthDayE-M-H.html](http://science.dadeschools.net/earthDayE-M-H.html)

We encourage schools to register and share their Earth Day Events at [http://www.earthday.org/earth-day/earth-day-theme/](http://www.earthday.org/earth-day/earth-day-theme/)

![Happy Earth Day!](image)
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Primary

2017 Earth Day

Take Action!

SC.K.N.1.4
SC.1.N.1.4
SC.2.N.1.3
SC.3.N.1.1
Kindergarten
Big Idea 1: The Practice of Science
Benchmark: SC.K.N.1.4
Observe and create a visual representation of an object, which includes its major features.

First Grade
Big Idea 1: The Practice of Science
Benchmark: SC.1.N.1.4
Ask "How do you know?" in appropriate situations.

Second Grade
Big Idea 1: The Practice of Science
Benchmark: SC.2.N.1.3
Ask "How do you know?" in appropriate situations and attempt reasonable answers when asked the same question by others.

Third Grade
Big Idea 1: The Practice of Science
Benchmark: SC.3.N.1.1
Raise questions about the natural world, investigate them individually and in teams through free exploration and systematic investigations, and generate appropriate explanations based on those explorations.
Earth Day Stamp Activity

Earth Day is celebrated by people all over the world who look at our planet and acknowledges what needs to change. This year is the 47th Anniversary. It is a great time to teach our students about the planet in which we live, and the importance of taking care of it each day.

Have students create a commemorative postage stamp to celebrate Earth Day. Choose from any of the following themes:

1) Protective habitats
2) The Meaning of Earth Day
3) Protect the Earth from Climate Change
4) Recycling
5) Litter Prevention

Use the Earth Day Stamp template and have students design their stamp commemorating Earth Day 2017.
INTRODUCTION

In this lesson, students will learn about the essential parts of an ecosystem and how a nature journal can be used to better understand the relationships between these parts. John Muir’s journals of Yosemite National Park will be used as an example of how detailed observation can be used as a scientific tool to better understand ecosystems. Students will create their own nature journals and record observations about the components of their school yard ecosystem.

LESSON OVERVIEW

Grade Level & Subject: Grades K-4 Science and Art

Length: 1 class period

Objectives:
After completing this lesson, students will be able to:
- Understand how scientific study leads to the protection of natural areas.
- Identify John Muir and describe his work.
- Identify the components of an ecosystem.
- Describe the value of environmental observation.

Next Generation Science Standards Addressed:
This lesson addresses the following Next Generation Science Standards:
- K-PS3-1. Make observations to determine the effect of sunlight on Earth’s surface.
- K-LS1-1. Use observations to describe patterns of what plants and animals (including humans) need to survive.
- K-ESS3-1. Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live.
- 2-LS4-1. Make observations of plants and animals to compare the diversity of life in different habitats.
- 5-LS2-1. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment

Materials Needed:
- Excerpt from ‘The Earthquake’ by John Muir (see attached)
- ‘Parts of an Ecosystem’ Diagram (see attached)
- Blank paper; one for each student
- Markers/color pencils/crayons/water colors etc.
Assessment:
Students will be assessed through the following activities:
  - Participation in group discussions
  - Completion of a nature journal entry

LESSON BACKGROUND

Relevant Vocabulary:

- **Abiotic**: The non-living components of an ecosystem, like rocks, soil, temperature and weather.

- **Biotic**: The living components of an ecosystem, like plants, animal, bacteria and other organisms.

- **Ecosystem**: All of the living and non-living components of an environment that interact to function as a system.

- **Food web**: A series of organisms each dependent on on others for food, including producers (plants), consumers (animals and insects) and decomposers (bacteria and worms).

- **Habitat**: The natural environment where a particular species or community of animals lives; the physical environment that surrounds and influences them.

- **John Muir (1838-1914)**: An American naturalist, author, and environmental advocate. He founded the Sierra Club and fought to protect natural areas in the American West.

- **Naturalist**: One who studies natural history, specifically a botanist, zoologist or field biologist.

- **Nature journal**: A tool used in the field to record observations; typically a notebook format; also called a field journal.

- **Primary producer**: The organisms in an ecosystem the convert the sun’s energy and inorganic material.

Background Information:
The Earth is covered in overlapping and interrelated ecosystems. The borders between ecosystems are often not particularly clear cut, but they are delineated by areas that share the same or similar plants, animals, and physical environments. They can be as small as the community of insects living in a single tree or as large as the entire planet. While ecosystems appear very different from one to another, they all contain biotic and abiotic components, including plants, animals, soil, water, and sun. Studying an ecosystem means understanding how each of the biotic and abiotic components impacts the others, either directly or indirectly.
Ecosystems receive their energy from the sun, and this energy works its way through **food chains** to other members of the system.

**Primary producers**, or plants, use the sun’s energy and nutrients from the soil, air, and water to grow and produce food for others. Since all parts of an ecosystem depend upon the others, the physical aspects of the environment effect the growth of primary producers, which intern determines the characteristics of a particular ecosystem. For instance, the thin soils and cold climate of high altitude areas limit growth and produce an ecosystem of relatively low productivity with plants and animals adapted to these conditions.

While it may be easy to recognize the differences between ecosystems in the amazon and those in the arctic, the subtle differences that may be found just over the next hill take careful observation to identify. One particularly valuable tool used by scientists called **naturalists** in identifying these differences is the **nature journal**. Nature journals, or field journals, are detailed records of specific natural conditions and events in a particular area. The information recorded in nature journals has been used, especially before advancements in scientific equipment, to identify ecologically significant or unique areas, as well as new species of plants and animals. Journals are a common tool for data collection both in the field and in the laboratory to record observations.

**John Muir** is an American naturalist who spent many years studying the complex workings of the Sierra Nevada Mountain ecosystem. Muir recorded over 7,000 pages of observations in his nature journals throughout his lifetime. He worked tirelessly to protect the natural places he studied, and eventually his work helped persuade the US Congress to create Yosemite Valley and Sequoia National Parks in California. His work earned him the title of the ‘father of the national parks’.

**Resources:**
- Geography for Kids – Ecosystems
  Basic discussion and definition of ecosystems
- American Society of Naturalists
  [http://www.amnat.org/home.html](http://www.amnat.org/home.html)
  National Park Service – Yosemite National Park
  [http://www.nps.gov/yose/historyculture/muir.htm](http://www.nps.gov/yose/historyculture/muir.htm)
  Biography of John Muir
- National Park Service and NatureBridge.com – Yosemite Field Journal
  Youth field journal designed specifically for Yosemite Nation Park
  The Sierra Club – The John Muir Exhibit
  Access to some of Muir’s writing and sketches, as well as an extensive history
LESSON STEPS

Warm-up: Muir’s Journal

1. Introduce John Muir and explain that his work as a scientist is so important because of the detailed descriptions of environments he recorded in his nature journals.

2. Read Muir’s journal entry entitled ‘Earthquake’ which can be found at the end of this lesson.
   a. Have the students listen for the ways in which the earthquake changed the environment.

3. To bridge Muir’s journal with the larger concept of an ecosystem, close with a brief discussion of what Muir observed. The following are possible discussion questions.
   a. What trick did Muir use in the very beginning of the entry to more closely observe how the earthquake was moving the ground? He placed a bucket of water on his table and watched how the water moved.
   b. What are some of the ways that the earthquake changed the environment? It may be helpful to make a list.
   c. What are the ‘actors’ in the story that Muir says this event tells? Put differently, what are the things the earthquake affected? Boulders, streams, trees, mountains, lakes, etc.
   d. Are there any ways that the boulders or other actors may have affected the animals in that area? The boulders created pools and rapids in the streams; they changed the fishes’ habitat. Meadows were covered so that deer and other animals could no longer graze on them. The new rock piles expanded habitat for small animals that like to live in nooks and crannies.

Activity One: Drawing out Ecosystems

1. Have the class close their eyes and picture their schoolyard (or a nearby natural area that they would all be familiar with). Ask them to visualize all of the different plants, animals, nonliving things, and different weather conditions that they can picture.

2. While their eyes are closed, make four columns on the board and label them plants, animals, non-living things, and weather conditions.

3. Ask the class to open their eyes and ask for suggestions for each column.
4. After each column has a reasonable number of suggestions, circle two items from
different columns and connect them with a line. Ask students how these two might
affect one another. Repeat this several more times until the connecting lines begin to
look like a tangled web over the original columns.

5. Explain to the class that by identifying all of the characters and how they affect one
another, they have just described the ecosystem. Draw a large circle around the
columns and label it ‘schoolyard ecosystem’.
   a. Ask if anyone has heard the term ecosystem.
   b. Given how they connected all the parts on the board, could they describe what
      it means?

6. Display the ecosystem graphic if necessary, and further explain ecosystems using
the information in the background and vocabulary sections.

Activity Two: Exploring our Local Ecosystem

1. Ask students to think about what Muir was observing and describing in the journal
   entry.
   a. Was it just about an earthquake?
   b. How did Muir describe the ecosystem?

2. Explain that understanding an ecosystem requires careful observation. A nature
   journal is one tool that scientists like John Muir have used record these observations.
   Journals create a detailed record of plants, animals, soils, and weather conditions
   through drawings and written descriptions.

3. Explain that students will now be going out into their schoolyard to observe the
   ecosystem around them. They will record their observations in a nature journal.
   a. Ask students what kind of information they should include in their journal entry
      in order to document their ecosystem. Using the items and categories from the
      lists on the board will help.
   b. Their entry should include (it may be helpful to write these on the board or
      have the students record them on their sheet of paper before going outside):
      i. Date
      ii. A description of the weather conditions (and drawing if possible).
      iii. A description of the soil (color, texture, is it damp or dry?).
      iv. A drawing of a plant with a brief description of where they found it (e.g.,
          in the shade, in an open area, etc.), labeled with parts of the plant
          (stem, root, petal, etc).
      v. A drawing of an animal or insect and description of its location and what
         it was doing, labeled appropriately.

4. Before going outside:
   a. Give each student a blank sheet of paper on which to make their entry.
b. Set clear boundaries on where they may explore.
c. Make sure everyone has a clipboard/notebook for use as a solid surface to draw on and that everyone has something to draw with. If students don’t have their own colored pencils, consider having a ‘coloring station’ where a communal set may be used after they make their initial sketches.

5. Return to the classroom with 10 minutes remaining.

Wrap Up: Sharing Entries
1) After students have returned to their seats, ask for volunteers to share their entries.
   a) What features, organisms, or plants did they observe?
      i) How did (or might) these organisms, plants and features interact with each other?
      ii) How did certain parts of the plants or animals make these interactions possible?
   b) Would they have seen these if they hadn’t been making close observations for their journals?

2) Ask the class if they are a part of the schoolyard ecosystem.
   a) How do they interact with some of the actors they observed?

3) Ask students if they found these observations difficult or easy.
   a) Could they imagine studying the outside world like John Muir did for many years?

Extensions:
- Repeat the outdoor journaling activity several times throughout the school. Students can log observations from the same location, recording how changes throughout the year.
- Have students expand their journals by adding more pages and a cover made out of cardboard or a recycled paper grocery bag. Decorate journals using recycled materials.
- Draw a large map of the area that students observed on a large sheet of paper. Have students add descriptions or drawing from their journal entries where they made their observations, creating a detailed map of how their schoolyard ecosystem varies across the area.

CONCLUSION
After completing this lesson, students will have an understanding of ecosystems and the parts that comprise them. They will also have developed a data collection skill based on detailed observations by undertaking a nature study of a local area. Students will also have gained an appreciation for a historical figure in American environmentalism, John Muir.

LESSON PLAN CREDITS
Nick McGuire - Education Consultant, Earth Day Network
Christine Robertson - Director of Education, Earth Day Network
Excerpt from “Earthquake” by John Muir

Our National Parks (1901)

“The rocks trembled more or less every day for over two months, and I kept a bucket of water on my table to learn what I could of the movements. The blunt thunder-tones in the depths of the mountains were usually followed by sudden jarring, horizontal thrusts from the northward, often followed by twisting, jolting movements. Judging by its effects, this earthquake was gentle as compared with the one that gave rise to the grand boulder system of the mountains. Nature, then created, as we have seen, a new set of features, simply by giving the mountains a shake – changing not only the high peaks and cliffs, but the streams. As soon as these rock avalanches fell every stream began to sing new songs; for in many places thousands of boulders were hurled into their channels, roughening and half damming them, forcing the waters to surge and roar in rapids where before they were flowing smoothly. Some of the streams were completely dammed by drift-wood, leaves, etc., filling the spaces between the boulders, thus giving rise to lakes and level pools; and these, again, after being gradually filled in, to smooth meadows, through which the streams now silently meander; while at the same time some of the boulders took the places of old meadows and groves. Thus rough places were made smooth, and smooth places rough. But on the whole, by what at first sight seemed pure confusion and ruin, the landscapes were enriched. All Nature’s wildness tells the same story.”

Retrieved from The Sierra Club: http://www.sierraclub.org/john_muir_exhibit/writings/the_earthquake.aspx

Stream and Forest Ecosystem
Retrieved from: http://mamontoff.org/SCIENCE_ecosystem.jpeg
Happy 47th Anniversary Earth Day

As the 47th anniversary of Earth Day approaches people around the world are taking environmental action and are committed to making the world a better place. Have students create Papier-Mâché globes to display around the classroom in preparation for the 46th Anniversary Earth Day celebration. Students will be able to make their own globe of the Earth from a balloon covered with newspaper, flour-water glue, and paint.

Materials needed:

- A round balloon
- Lots of newspaper
- Flour and water glue
- A container for mixing the glue
- A spoon or stick to stir the glue
- A printer
- Pencil
- Blue and green tempera paint
- Paint brushes
- A dark marker

1) Make a simple mixture of thin glue from flour and water. Mix 1 cup of flour into 1 cup of water until the mixture is thin and runny. Stir into 4 cups of boiling water (the heating gives the glue a nice consistency, but is not necessary). Simmer for about 3 minutes, and then cool.

2) Tear a lot of strips of newspaper. Strips should be about 1 inch wide; the length doesn't really matter.

3) Blow up and tie a round balloon for each student.

4) Papier-Mâché: Dip each strip of paper in the flour glue, wipe off excess, and wrap the strip around the balloon. Have at least three layers surrounding the balloon. Let it dry (at least overnight) after each layer. Let the globe dry completely (it may take a few days). When the papier-mâché is dry, the balloon usually pops by itself, and separates from the outer papier-mâché skin.

5) Print out maps of the Earth (or use a commercial globe or maps).

6) Have students draw the Continents on the Globe:

- Using a pencil, draw a line around the midsection of the balloon representing the equator, and draw a dot for each of the poles.
- Draw the continent you live in. To draw each continent, show the student the shape of that continent, how big it is in relation to the globe, and where it is positioned (with respect to the equator, the poles, and the other continents). Using a pencil, draw that continent on the globe.
- Repeat this process for the other continents.

7) When the continents are done and the paint has dried, use blue paint to represent the oceans, seas, and lakes. Let the paint dry.

8) Using a dark marker, have the student label the major features on the globe and also where the child lives. The student can mark and label the equator, the seven continents, the oceans, the poles, etc. (depending on the student's grade level).

*From Enchanted Learning
Recycling Acrostic Poem

Write an acrostic poem about recycling. Start each line with a letter from the word “recycle.”

R

E

C

Y

C

L

E
Earth Day Alphabet

Find Earth Day words and that begin with the letter

Example: W - Water

| A | N |
| B | O |
| C | P |
| D | Q |
| E | R |
| F | S |
| G | T |
| H | U |
| I | V |
| J | W |
| K | X |
| L | Y |
| M | Z |
The Gift
By: Kim Moon

Begin this activity by asking the students what they would do if they found a worm in their house. Listen to the feedback from the students. Ask them to listen carefully to the story of “The Gift”, by Kim Moon.

Once you have read the story to the students ask them the following questions:

1) **Who** are the characters in the story?
2) **What** happened in the story?
3) **When** did Meredith and her Grandfather go and get the special tree?
4) **Where** did Meredith and her Grandfather go to get the special tree for Meredith?
5) **Why** are earthworms important?
6) **Describe** how Meredith could help her grandmother take care of her new pear tree.
7) **Explain** why the pear tree was the best present of all.

The follow-up questions will require the listeners to respond to the Five W's (who, what, when, where, and why). This is a great tool to boost comprehension skills!
Meredith held the worm up in front of her grandmother. "Ick!," she laughed, "he is so slimy." Mimi nodded as Meredith returned the earthworm to the soil and kept digging the hole for the flower she was planting. "Did you know that even the smallest earthworm is very important to us?" "Important? How could a tiny, slimy thing like that be important?" Mimi smiled and said, "I thought you would be surprised at that. Earthworms make their tunnels all over the place underground. Every tunnel that they make leaves space for air to flow under there. That is called aerating the soil, and it helps plants grow. That helps the plants, and us, because we enjoy the plants." Meredith thought for a minute and then laughed, "They are still slimy." They finished planting the flowers and Mimi went inside while Meredith and her grandfather worked on their birdhouses in Pawpaw's workshop.

"Pawpaw, can I ask you a question?" "Sure, Meredith, you know that you can. Are you worried about something?" "Well, it's just that Mimi's birthday is coming up soon and I can't think of anything that I could get her. Daddy said that he would give me some money, but then it really would not be a present from me. Besides, I can't think of anything she would want." Pawpaw thought for a minute. "You know, you give Mimi a present every time you come over here and help her plant flowers..." Meredith frowned. "That's not the same, though. I want to do something to surprise her." "Well," Pawpaw said, "have you heard her say anything that she wished she had?" Meredith thought for a minute and then smiled. She leaned over and whispered in her grandfather's ear. "That is a great idea! She will love that! We will go next week and pick it out!"

The next week, Meredith and her grandfather went to the nursery and picked out a special tree for Mimi. They took it back to the house and planted it in the yard, next to the driveway. Meredith tied a big blue bow around the tree, because blue was Mimi's favorite color. "Perfect!" Pawpaw said. They went inside, got Mimi, and tied a blindfold over her eyes so that she would be surprised after they led her outside. When they took off the blindfold, Mimi gasped. "A pear tree, I have been wishing I had a pear tree! Meredith, you picked the perfect present for my birthday. Thank you." Meredith and Mimi hugged. "Pawpaw helped me plant it and I am going to help you take care of it." Meredith felt good, because she had given her grandmother the best present of all -- something that would grow that they could take care of -- together!
Earth Day Pinwheel

A pinwheel is a simple machine that can demonstrate the strength or speed of wind. A moving fluid, such as air (even your breath), steam, or water, can turn this simple machine and create useful **mechanical energy**. This energy can be used to lift things. Have students create an Earth Day Pinwheel. Students will discover that the pinwheel only spins when the wind hits its center.

**Materials:**

- Earth Day Pinwheel Template
- Glue Stick
- Push Pins/Tacks
- Pencils with eraser
- Construction Paper

**Instructions:**

- Fold on the dotted line to make a square decorated on both sides.
- Cut the construction paper between the two halves to make the pinwheel sturdier.
- Glue the sides so you have a square decorated on both sides.
- Cut on the diagonal dotted lines (do not cut all the way into the middle).
- Bend each corner to the center dot, but do not crease the folds.
- Push a pin through the center into the eraser of a pencil (do not push it too tight).
- Have the students blow the edge of their pinwheel to make it spin (if it does not spin, loosen the pin a little or wiggle it around to make the hole in the paper bigger).

*Adapted from DLTK’s Crafts for Kids*
Earth Day Pinwheel Template
Intermediate

2017 Earth Day

Take Action!

SC.4.N.1.1
SC.5.N.1.1
SC.5.N.2.1
Grades Four and Five

Reporting Category: The Nature of Science

Big Idea 1: The Practice of Science

Benchmark: SC.4.N.1.1 Raise questions about the natural world, use appropriate reference materials that support understanding to obtain information (identifying the source), conduct both individual and team investigations through free exploration and systematic investigations, and generate appropriate explanations based on those explorations.

SC.5.N.1.1 Define a problem, use appropriate reference materials to support scientific understanding, plan and carry out scientific investigations of various types. (Also assesses SC.3.N.1.1, SC.4.N.1.1, SC.4.N.1.6, SC.5.N.1.2, and SC.5.N.1.4.) (AA)


Benchmark: SC.5.N.2.1 Recognize and explain that science is grounded in empirical observations that are testable; explanation must always be linked with evidence. (Also assesses SC.3.N.1.7, SC.4.N.1.3, SC.4.N.1.7, SC.5.N.1.5, and SC.5.N.1.6.) (AA)
Earth Day Story

Overview of Lesson Plan: In this lesson, students will read about Earth Day and how they can start thinking about ways in which to be more efficient. They then will create an energy tree showing simple things people can do to make other places where they spend time more energy efficient as well.

Concept: Earth Day is observed annually during the Spring to bring awareness of and an appreciation for the Earth’s environment.

Skills:
- Building reading comprehension
- Understanding the need for environmental conservation
- Identifying ways to conserve

Materials:
1. Earth Day Story
2. Leaf Template
3. Scissors
4. Pencils
5. Earth Day Story Word Search

Activities: Read the “Earth Day Story: What Can I Do?” to the class. At the end of the story ask them to think about ways they can adjust their behavior to use energy more efficiently. Next, have the students cut out the leaf template and write what they could do to make a difference in the world, just like the children did in the story. Be sure to hang up the leaves that will be created on your classroom tree or display area.

Guiding Questions:
1. What are some relatively simple and inexpensive things, people can do to make their homes more energy efficient?
2. What are some things that can be done to make our classroom more efficient?
3. How does each of your suggestions actually conserve energy?
4. Describe something mentioned in the story you already do to conserve.
5. Tyler inspired his classmates to make a difference in the world. What could you do to inspire others?

Evaluation: Students will complete the Earth Day Story Word Search.

Home Learning: Write a one-paragraph pledge describing what you will do to make a change for one week to conserve energy at home or at school.
Heart of a Watershed  
(Everglades Foundation activity)

In groups of 3-4, make two models: one of the historical Everglades Watershed and one of the present-day Everglades.

1. **Part 1 The Historic Everglades**

   To build the model:
   - Place the paint tray on a flat surface. Designate a “north” side and a “south” side.
   - Using toothpicks and post it tabs make labels for each body of water:
     - Lake Kissimmee
     - Kissimmee River
     - Caloosahatchee River
     - St. Lucie River
     - Lake Okeechobee
     - “River of Grass”
     - The Florida Bay
   - Take the clay and spread in the northern 2/3 of the pan in the shape of the Florida peninsula. Leave the south side empty to represent the Florida Bay. Label the Florida Bay.
   - In the center of the clay, make a 3” diameter indentation, about ½” deep to represent Lake Okeechobee. Label Lake Okeechobee.
   - Using the *Map of The Historic Everglades* as a guide, make channels in the clay to represent the Kissimmee River and Lake Kissimmee, as well as the Caloosahatchee River, and St. Lucie Canal. (Note: notice how the historical Caloosahatchee River barely connects with Lake Okeechobee.) You can even use different colors of clay to represent each of these features in your model. Make sure the Kissimmee River “meanders” as it does in the diagram.
   - Put toothpick labels in the model to designate locations.

2. Slightly lift the north end of the pan and pour water into the “Lake Kissimmee” and check to see if it flows into “Lake Okeechobee.” The lake should overflow at its southern end. Keep pouring water until water flows into the “Florida Bay.”

**Questions**

1. How long do you think it would actually take for water to flow from Lake Okeechobee down to Florida Bay?

2. What is the advantage of having a slow, steady flow of water would be to the ecosystems and animals that lived in them?
Part 2 The Altered Everglades

To build the model:

- Place the paint tray on a flat surface. Designate a “north” side and a “south” side.
- Using toothpicks and post it tabs make labels for all areas listed below
  Label:
  - Lake Kissimmee
  - Kissimmee River
  - Lake Okeechobee
  - The Caloosahatchee River
  - The St Lucie River
  - Everglades Agricultural Areas
  - ARM/Loxahatchee NWR
  - Water Conservation Areas
  - Big Cypress National Preserve
  - Tamiami Trail
  - Everglades National Park
  - Florida Bay

- Take the clay and spread in the northern 2/3 of the pan in the shape of the Florida peninsula. Leave the south side empty to represent the Florida Bay. Label the Florida Bay.
- In the center of the clay, make a 3” diameter indentation, about ½” deep to represent Lake Okeechobee. Label Lake Okeechobee.
- Using the Map of The Altered Everglades as a guide, make channels in the clay to represent the Kissimmee River and Lake Kissimmee, as well as the Caloosahatchee River, and St. Lucie Canal. Notice the altered shape of the Kissimmee River is a straight channel, and the Caloosahatchee River and the St. Lucie Canal are now connected with Lake Okeechobee and are wider and deeper.
- Put toothpick labels in the model to designate locations
- Slightly lift the north end of the pan and pour water into the Kissimmee River. As water flows into Lake Okeechobee and then through the Caloosahatchee and St. Lucie Canal, note how much of the water makes it to the Florida Bay.

Questions:

1. How do the alterations to the Everglades affect the water flow to the Florida Bay and to the east and west coasts of southern Florida?
2. Why were these changes made?
3. What are the advantages and disadvantages to the altered systems? Name two of each.
The little boy walked sadly down the cracked sidewalk. His backpack was heavy and his feet were slow. He stayed to his path, pausing every now and then only to pick out a new can or wad of paper to kick as he went along his way. His heart felt as heavy as his backpack as he opened the door to his house and went inside.

His mother was in the kitchen, taking brownies out of the oven. She smiled as she turned around but stopped when she saw his face. "Tyler, what happened? Is everything okay?" "Nothing is okay, mom. Nothing will ever be okay again." He stood in the middle of the kitchen as his mother came over to the kitchen table. "Sounds like you had a rough day, Tyler. Is there anything I can do to help?" "That's just the thing, Mom. We can't help. There's nothing we can do." He sat down at the table and put his head in his hands. His mother sat down and waited a moment until Tyler began to speak again.

"Today, in science, the teacher was talking about Earth Day and the environment. Earth Day is supposed to be a day when every person promises to do something to help take care of our world. Mrs. Green was telling us how many companies are not careful about how they get rid of their industrial waste. She said that our world is getting dirtier and that many animals and plants are dying. She wants us to think of something we can do to help and I thought all the way home and there is nothing I can do. I can't stop the companies from polluting our air and water and I can't save all of the animals! There is not anything that I can do to make a difference."

His mother sat for a minute, thinking. "You sound like this really concerns you and that you have put a lot of thought into it, Tyler." Tyler nodded. "Let me tell you a story that your grandfather told me. I don't know where he heard it, but I think that it might help you think about your problem in a different way." She began, "one morning a man was walking down a beach that was covered in dying starfish. The tide the night before had been especially strong and thousands of starfish had been washed up on shore, too far up for them to make it back into the water by themselves. The man shook his head as he trudged along thinking what a shame it was that all of those starfish would die on the beach."
He came upon a boy who was throwing starfish back into the ocean as fast as he could. He was out of breath and it was obvious that he had been at this task for a while. "Son," the man said, "you might as well quit. There are thousands of them. They are washed up all over the beach as far as you can see. There is no way you can make any sort of a difference." The boy did not even pause in what he was doing. He kept bending and throwing but as he did, he spoke to the man, "I can make a difference to this one, and this one, and this one." And the man thought, and he knew the boy was right. He began to help return the animals to their home, smiling at how life's biggest lessons sometimes came from the smallest people.

Tyler stared intently at his mother. "But he did make a difference, didn't he? To every starfish that he threw back in?" His mother nodded, smiling. He sat for a moment, thinking about what his mother had said. "So, what it means is that even though I can't change everything, I can make a big difference by doing the little things that matter?" "That," she said, sliding him the plate of brownies, "is exactly what I am saying." Tyler grinned and took a brownie from the plate. "That gives me an idea." His mother smiled even bigger and said, "I kind of thought that it might."

The next morning on the way to school, his feet hardly touched the ground. He told his teacher the story of the starfish and his idea. Mrs. Green thought it was a great idea, and decided to let Tyler share the story and his idea with the class. Everyone got to work immediately, cutting out the large green leaves.

On Earth Day, there was an assembly and everyone in the community was invited. Many of those gathered were startled to see the large brown tree trunk affixed to the auditorium wall. They sat, puzzled, and waited for the program to begin. A boy, dressed up to look like a man, walked across a stage filled with starfish. The play went on as Tyler and his class told the story taking place. When it was over, the audience applauded as Tyler stood at the podium."
We were all thinking, and it was frustrating because we didn’t think that we could do anything. The problems seemed too big for us to do anything about them. But we decided that together, even the little things we do could add up to mean a lot to our world. "We want every person to think of one thing they can do that could make a difference to our world. Even if it seems like something small, it will matter."

The audience began writing, and soon the tree was covered with the green leaves. Tyler and his class read many of them as they attached them to the tree. "I will walk to work." "I will use both sides of my paper to save trees." "I will have my pet neutered so there won’t be any puppies born that won’t have a home." "I will plant a tree every year." "I will start recycling my newspapers." Tyler thought, and bent to write his promise on the leaf. Soon, the tree was beautiful and green and covered with the Earth Day promises. People were laughing and talking as they left, thinking of what they had promised to do.

When the dismissal bell rang, Tyler got his backpack and began the short walk home. As he reached the sidewalk, he pulled an old grocery bag from his backpack. He began picking up the trash as he made his way home, instead of kicking it. He smiled all the way, thinking of the difference they would make.
Earth Day Story Word Search
Earth Day Story Word Search

Read each of the 11 clues below to find the words that you will need for your Earth Day word search. Words appear straight across, backwards straight across, up and down, down and up, and diagonally.

1) The little boy walked sadly down this cracked surface.
   _____________________________________________________

2) What was Tyler’s Mom baking?
   _____________________________________________________

3) What was the topic of discussion in Mrs. Green’s class?
   _____________________________________________________

4) Tyler’s mother told him a story that was told by his
   _____________________________________________________ to her.

5) In the story that Tyler’s mother told, a man was walking down the beach and found these
   dying all around.
   _____________________________________________________

6) The ______________________ was invited to the assembly.

7) Which wall was the big brown tree trunk affixed?
   _____________________________________________________

8) What did the kids begin to pass out to the audience?
   _____________________________________________________

9) The author of the Earth Day Story is
   _____________________________________________________

10) What did Tyler pull from his backpack to place the trash?

11) Look closely at the word search and see if you can find the secret 3-word message.
   _____________________________________________________
Leaf Template

Name

____________________________

One thing I will do to make a difference______________________

____________________________

____________________________

____________________________

____________________________
Ocean in a Bottle

This lesson developed by Reach Out!

Recommended Age Group: Elementary

Guiding Questions:

1. What is pollution?
2. Which liquids mix with water?
3. Which liquids won’t mix with water?

Concepts

- Pollution in our oceans, lakes, rivers and streams is a very serious matter. Pollution is when we add things to the ground, the air, or the water that will make it dirty or will bring harm to the life in and around it.

- People often dump liquids into oceans, lakes, rivers and streams. Some of these liquids will mix with water; others will not.

Principles

- When a liquid will mix with water, we might have a hard time even knowing it is there. So, water may look pure but really be mixed with another liquid that will harm plants, creatures or people.

- Sometimes a liquid we add to water will at first mix with the water, but then separate out again so we can see that it is actually there. This is a settling process.

Facts

- We must be careful about what we dump into our oceans, lakes, rivers and streams.

- Many of the liquids we are putting into our water systems will make it harmful for the life in and around it.

- Too often, water can look like it is safe and clean when it actually is not.
• Liquids that will mix with each other are called miscible.
• Liquids that will not mix with each other are called immiscible.

Skills
• Making Observations
• Making Comparisons
• Communicating Findings
• Making Inferences
• Drawing Conclusions

Materials
Each person or pair needs the following:
1. 2-liter clear bottle
2. Measuring cup
3. 8 Cups Water
4. 1-1/2 Cups Vegetable oil
5. 1-1/2 Cups Shampoo or Liquid Laundry Detergent
6. Funnel
7. Paper towels for any spills

Room Preparation
Need ample elbow room. Spills may happen.

Safety Precautions - None

Procedures and Activity

Introduction
Begin experiment by asking the guiding questions:

1. What is pollution?
   Share ideas about examples of pollution. Then try to come up with a definition. Help them see that pollution is making something dirty or unsafe for life. Lead into thinking
about water pollution. Talk about our oceans, lakes, rivers, and streams. What have they heard or read about pollution in these water bodies? Do they ever think about whether or not the water they swim in is safe? Have they ever been concerned about the fish we eat being poisoned and harmed from living in polluted water?

2. Which liquids mix with water?
   One big problem is that too often our oceans, lakes, rivers and streams can look like they are safe and clean when in fact they are not. Some of the solids and liquids we are dumping into water will mix up with the water so we cannot see them with just our eyes. Some things we put into water will not mix and we can see evidence that they are there. What we cannot see is a big problem!

3. Which liquids won’t mix with water?
   Today we will do an experiment by making an “ocean in a bottle.” We will try mixing different liquids with water to see what will and will not mix. In particular, we will see if oil or detergent will mix with water. Do you think we should drink in water with oil and/or detergent in it? Are these two liquids harmful to plant life, fish or other creatures? Oil and detergents are two common liquids that get dumped into our waters.

Activity

1. Make a “bottle ocean”
   Each student or pair should put 3 cups of water into their clean 2-liter bottle. This is like a little ocean, lake, river, or stream.

2. What happens when oil is mixed with water?
   Add 1 cup of oil by pouring it into the bottle via the funnel. Screw top on bottle. Mix up the liquids by shaking the bottle. Observe what happens. We observe that oil and water will not mix. We call liquids that will not mix with each other immiscible. What do you think happens when there are oil spills in the oceans? How will oil affect the water, the fish, plant life or animals that live near the water?

   You may want to leave the bottle tipped on its side overnight. The next day, see if the oil settled or not. How would this impact our knowing that oil existed in an ocean or lake? How would this help us think about cleaning up oil spills?

3. Remove oil and water mixture and rinse out bottle. What happens when soaps and detergents are mixed with water? Put 3 cups of water in the clean 2-liter bottle. Add 1 cup of dish soap or liquid laundry detergent via the funnel. Screw top on bottle. Mix up the liquids by shaking the bottle. Observe what happens. We observe suds, bubbles and foaming. Do the two liquids combine? When two liquids will mix with each other, we call them miscible.
You may want to leave the bottle tipped on its side overnight. The next day, is the detergent still mixed up with the water or did it separate? Can you still see the foaming and suds? How does this impact our thinking about soapy kinds of pollution?

4. What happens when oil and soap are mixed with water?
   Empty, rinse and clean the bottle. Add 3 cups of water, 1/2 cup of oil, and 1/2 cup of soap or detergent. Screw on top. Shake the bottle to mix the liquids. Look at what happens. Can you see evidence of the oil and soap? Observe what goes on in the bottle over a period of time. You will find that oil will mix with soap and then with water. This makes it very dangerous for our water systems. Oil can be present and we don’t really see it because it got mixed up and broken down with soap and water.

   Compare this to trying to wash an oily pan after cooking with it. If you try to use just water, the oil won’t come off. But when we add a little dish detergent, we can get rid of the oil.

**Evaluation**

Ask again,

1. What is pollution?
2. What liquids mix with water?
3. What liquids won’t mix with water?

Share how learning about liquids that will and will not mix with water is related to our concerns about pollution. Can we always see pollution? If some dangerous liquids will mix with water, how can we clean it up? Listen to ideas, observations made during the experiments, and concerns to determine whether or not they understand pollution and the concept of liquids mixing or not mixing with other liquids.

It always is a great idea to have them help someone else conduct an experiment. We really know and understand something when we can share it with others!

**Extension Ideas**

1. Repeat this type of experiment using different kinds of liquids that are commonly put into our lakes and oceans. See what liquids will and will not mix with water.

2. Research to learn more about certain pollutants. Find out where these pollutants come from, what harm they may cause to life and the water, and how we are trying to avoid this pollution or clean it up.
3. Research a particular ocean, lake or river. Find out how “healthy” the water is. What kinds of pollution concerns are there? They may find out about malformed critters that are linked to pollution. Or there may be evidence that certain plant life or other life is in jeopardy or even becoming extinct because of pollution.

4. Plan an environmental field trip:
   - Collier Road Landfill in Pontiac
   - Ecology Center in Ann Arbor
   - Gerald E. Eddy Discovery Center
   - Nichols Arboretum in Ann Arbor
   - Project Grow in Ann Arbor

**Careers Related to Lesson Topic**

- Chemist
- Environmental Careers
  - Environmental Engineer
  - Environmental Scientist
  - Presentation Project Grow

**Prerequisite Vocabulary**

**Liquid**

A substance that is wet and flows

**Immiscible**

The quality of liquids that will not mix up and combine with each other

**Miscible**

The quality of liquids that will mix up and combine with each other. A hint to remember this word is to think of “mixable”!

**Pollution**

The act of dirtying of water (or air or ground) and making it unsafe for life.

To [Lessons by Subject or Age Group](#)

To [Michigan Reach Out! Home](#)

Let us know what you think! E-mail our webmaster
Activities: Each student is to brainstorm how they would be able to imagine a human-powered device, a gadget, or a thing-a-ma-jig that will help to save planet Earth through conservation efforts.

Guiding Questions:

1. Can you think of an easy way in which individuals could recycle and save space at home?
2. If you cleaned your bedroom at home, how much recycling material would you find and how would you handle its distribution?
3. Do your toys run on solar or wind power?

Evaluation: Students will complete the Earth Day Invention Form.

Home Learning: Mail or email your Earth Day Invention idea forms to the Science Department. We would love to hear about your great ideas.

M-DCPS Science Department
1500 Biscayne Blvd. Suite 327 P
Miami, Florida 33132
Attention: Mr. Richard Morera
richardmorera@dadeschools.net

Earth Day Inventor

Overview of Lesson Plan: In this lesson, students will put on their creative hats and create an eco-friendly Earth Day invention.

Concept: The students will use their imagination as they come up with invention ideas that would help the environment at school, home, their community, or globally.

Skills:

- Creating imaginative inventions
- Understanding the need for environmental conservation
- Identifying ways to conserve

Materials:

1. Earth Day Invention Form
2. Pencils
Please complete this form describing your eco-friendly invention idea.

Your Name
___________________________________________________________________

School Name
___________________________________________________________________

Grade __________________

Name of your eco-friendly invention ______________________________________________

What environmental problem does it solve? ______________________________________________
____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________

How does it work? _____________________________________________________________
___________________________________________________________________________
___________________________________________________________________________
___________________________________________________________________________

Draw a picture of what it would look like. Do not forget to label the parts! If you need more space, draw on the back of this page.
2017 Earth Day

Resources

The benefits are endless!
Earth Day officially takes place on Friday, April 22, 2017. Miami has several fun events going on and around this date to celebrate Mother Earth.


The Village of Pinecrest invites you to celebrate our magnificent planet on **Sunday, April 23rd** when we open our gates FREE to the public for a day of activities for the entire family including workshops organized by the CLEO Institute and Plant Societies, food demos, planting activities, plant sales, an eco-fashion show, green vendors, wild life shows, local school performances, crafts for kids, lady bug releases, and so much more.

**Address:** 11000 Red Road, Pinecrest, FL 33156  
**Date:** Sunday, April 23, 2016  
**Time:** 12:00 p.m. - 4:00 p.m.  
**Admission:** Free

**Miami Seaquarium:**  [http://www.miamisea aquarium.com/plan-a-visit/events](http://www.miamisea aquarium.com/plan-a-visit/events)

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**Earth Day 2017 — 4 days, 4 events, 4 earth**

**Date:** April 20 – 23  
Join us for four fun and educational events for Earth Day (April 22). Each event has a focus that will engage the public and teach about some environmental issues that are surrounding their local ecosystems. Our 4 day event targets people of all ages and encourages them to be active and aware members of the community.

**4earth Biology By the Bay**  
*Thursday, April 20, 2017*  
This happy hour evening event will include a guest lecture by a South Florida Marine Biologist and/or Conservationist.

**4earth Mini Film Fest**  
*Friday, April 21, 2017*  
This family-friendly evening event will showcase an hour of Beneath the Waves short films about marine science.

**4earth Lionfish Derby**  
*Saturday, April 22, 2017*  
Through REEF, we will host a lionfish derby. During this event in fishermen volunteer to catch lionfish and bring them back to Miami Seaquarium for scoring, data collection, and a community picnic.
Go Green! Activities:

- Join us for an Earth Day twitter Chat hosted by NBC Learn on Friday April 21st from 1:00pm to 2:00pm using hashtag #MDPCSEarthDay and post your Earth Day activities all day!
- Students involved in the Fairchild Challenge sponsored by the Fairchild Tropical Botanic Garden should share their research and activities at their schools on Earth Day.
- Encourage families to participate in the local Earth Day activities such as Bayanza 2017 on Earth day

@MDCPSSci @MDCPSSTEAM

CCED ILLUSTRATED POEM CONTEST

As part of Chemists Celebrate Earth Day (CCED) activities, the American Chemical Society (ACS) is sponsoring an Illustrated Poem Contest for K-12 students. Participating ACS Local Sections invite area K-12 students to compete.

National Poem Contest Guidelines

All illustrated poems must first be judged at the local level in order to be considered for the national contest. Coordinators should carry out contests and judge the entries within their local sections. These local winners can then be advanced to the national contest.

Deadlines

Deadlines for local section contests vary, so contact your nearest CCED Coordinator for local contest deadlines. If no coordinator exists in your zip code, please contact outreach@acs.org.

FOR MORE INFORMATION VISIT:
http://www.acs.org/content/acs/en/education/outreach/cced/cced-illustrated-poem-contest.html
Earth Day Recommended Reading

Primary

- *Celebrating Earth Day (Circle the Year With Holidays)*, Janet McDonnell and Diana Magnuson
- *Clifford's Spring Clean-Up*, Norman Bridwell
- *The Lorax*, Dr. Seuss
- *The Earth and I*, Frank Asch
- *The Great Kapok Tree*, Lynne Cherry
- *Let's Celebrate Earth Day*, Peter Roop
- *Just a Dream*, Chris Van Allsburg
- *Mr. Garbage*, William H. Hooks
- *Our Big Home*, Linda Glaser

 Intermediate

- *Song of the Water Boatman and Other Pond Poems*, Joyce Sidman and Beckie Prange
- *Every Day Is Earth Day: A Craft Book (Holiday Crafts for Kids)*, Kathy Ross
- *Tanya's Big Green Dream*, Linda Glaser
- *Everything Kids’ Environment Book*, Sheri Amsel
- *Earth Day: Keeping Our Planet Clean*, Elaine Landau
- *The Bald Eagle- Endangered No More*, Mac Priebe
- *The Wolves Are Back*, Jean Craighead George
Activities to Celebrate Earth Day:

http://www.educationworld.com/a_lesson/lesson174.shtml

Global Water Supply Lesson Plans for Earth Day:


Environment Lesson Plans:

http://www.proteacher.com/110005.shtml

Reduce, Reuse, Recycle Theme Page:

http://www.cln.org/themes/recycle.html

KinderArt ® Art From Recycled Materials:

http://www.kinderart.com/recycle/

Celebrate Earth Day:


What On Earth Are You Doing?:

http://www.education-world.com/a_lesson/lesson059.shtml
Anti-Discrimination Policy

Federal and State Laws

The School Board of Miami-Dade County, Florida adheres to a policy of nondiscrimination in employment and educational programs/activities and strives affirmatively to provide equal opportunity for all as required by:

**Title VI of the Civil Rights Act of 1964** - prohibits discrimination on the basis of race, color, religion, or national origin.

**Title VII of the Civil Rights Act of 1964 as amended** - prohibits discrimination in employment on the basis of race, color, religion, gender, or national origin.

**Title IX of the Education Amendments of 1972** - prohibits discrimination on the basis of gender.

**Age Discrimination in Employment Act of 1967 (ADEA) as amended** - prohibits discrimination on the basis of age with respect to individuals who are at least 40.

**The Equal Pay Act of 1963 as amended** - prohibits gender discrimination in payment of wages to women and men performing substantially equal work in the same establishment.

**Section 504 of the Rehabilitation Act of 1973** - prohibits discrimination against the disabled.

**Americans with Disabilities Act of 1990 (ADA)** - prohibits discrimination against individuals with disabilities in employment, public service, public accommodations and telecommunications.

**The Family and Medical Leave Act of 1993 (FMLA)** - requires covered employers to provide up to 12 weeks of unpaid, job-protected leave to "eligible" employees for certain family and medical reasons.


**Florida Educational Equity Act (FEEA)** - prohibits discrimination on the basis of race, gender, national origin, marital status, or handicap against a student or employee.

**Florida Civil Rights Act of 1992** - secures for all individuals within the state freedom from discrimination because of race, color, religion, sex, national origin, age, handicap, or marital status.

**Title II of the Genetic Information Nondiscrimination Act of 2008 (GINA)** - prohibits discrimination against employees or applicants because of genetic information.

**Boy Scouts of America Equal Access Act of 2002** - no public school shall deny equal access to, or a fair opportunity for groups to meet on school premises or in school facilities before or after school hours, or discriminate against any group officially affiliated with Boy Scouts of America or any other youth or community group listed in Title 36 (as a patriotic society).

Veterans are provided re-employment rights in accordance with P.L. 93-508 (Federal Law) and Section 295.07 (Florida Statutes), which stipulate categorical preferences for employment.

In Addition:

**School Board Policies 1362, 3362, 4362, and 5517** - Prohibit harassment and/or discrimination against students, employees, or applicants on the basis of sex, race, color, ethnic or national origin, religion, marital status, disability, genetic information, age, political beliefs, sexual orientation, gender, gender identification, social and family background, linguistic preference, pregnancy, and any other legally prohibited basis. Retaliation for engaging in a protected activity is also prohibited.

Revised: (07.14)