

Conservation 101

Humans Impact the Earth: How students can be part of the solution?

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Grade Level	5th Grade	**Time Frame**	45 min
Subject	English/Language Arts, Science	**Duration**	3-4 class periods
Course	Environmental Science		

Essential Question

How can we as humans reduce our impact on Earth? How do you think the oil is impacting the surrounding environment? What is the best way to save the wildlife in this area and to clean up the water?

Summary

Students will inquire about what is happening in a photo. At first, they might say that it is the ocean or propose that it is a beach on an island or strip of land. As they view two more photos, they will see evidence of an oil spill. When they look back at the original photo, they will begin to see the darker strip of water as something that is not natural. They will then be given the task of devising the best way to clean up an oil spill and save wildlife. Reading and discussing information about oil spills and the clean-up process will take students to the next task of investigating other types of pollution. Students will discuss and decide what impacts humans make on the Earth and what they can do to protect and prevent environmental problems.

Snapshot

Engage

Students look at 3 photographs one at a time. They discuss and make a hypothesis on what they are seeing. The goal is for them to change their mind about the first picture after seeing all three.

Explore

Students clean oil from water and feathers to represent the ocean and wildlife in that environment.

Explain

Students create a chart in their notebooks with four columns labeled: Type of oil spill, Method used for clean-up, Pros of using this method, and Cons of using this method. Students read or listen to a book about oil spills and record information on their chart

Extend

Students research various types of pollution using the Jigsaw method. They record their information with the 3-2-1 strategy and share with the class.

Evaluate

Students write a two-paragraph summary. The first paragraph addresses the oil spill simulation, and the second paragraph students write about how they play an important role in the impact on Earth and what they can do to make things better.

Standards

Next Generation Science Standards (Grade 5)

5-ESS3: Earth and Human Activity
5-ESS3-1: Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.
3-5-ETS1: Engineering Design
3-5-ETS1-2: Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

Oklahoma Academic Standards for English Language Arts (Grade 5)

5.6.R.1: Students will use their own viable research questions to find information about a specific topic.
5.6.R.2: Students will record and organize information from various print and/or digital sources.

Attachments

- Data Collection Sheet—Conservation 101 - Spanish.docx
- Data Collection Sheet—Conservation 101 - Spanish.pdf
- Data Collection Sheet—Conservation 101.docx
- Data Collection Sheet—Conservation 101.pdf
- Infographics—Conservation 101.docx
- Infographics—Conservation 101.pdf
- Lesson Slides—Conservation 101.pptx
- Oil Spill Organizer—Conservation 101 - Spanish.docx
- Oil Spill Organizer—Conservation 101 - Spanish.pdf
- Oil Spill Organizer—Conservation 101.docx
- Oil Spill Organizer—Conservation 101.pdf

Materials

- Lesson Slides (attached)
- Data Collection (attached; 1 per student)
- Infographics (attached; optional)
- Oil Spill Organizer (attached; 1 per student)
- Sticky notes
- Oil Spill by Melvin Berger
- Epic: Environmental Disasters or Saving Animals from Oil Spills
- Items for the Oil Spill Simulation:
  Feathers, Tweezers, Toothbrush,
  Sponge, String, Cotton Ball
- **Dawn** dish soap
- Aluminum pans
- Paper towels
- Plastic plates

20 minutes

Engage

Teacher's Note

The Engage part of the lesson aims for students to change their thinking about what is happening in the first photograph. At first, they might say that it is the ocean or propose that it is a beach on an island or strip of land. Most students do not notice the color of the water at first glance and do not associate the dark color with an oil spill. As they see the following two photos, they view evidence of an oil spill. When they look back at the original photo, they begin to see the darker strip of water as something that is not natural. Sample photographs are provided on **slides 5-7**.

Display **slide 5**, the first aerial photograph of an oil spill in the middle of the ocean. Give students time to write what they notice and wonder/questions about the photo. They can also provide possible explanations for what they are viewing.

After discussing their ideas, display **slide 6** to show the second photograph, a seabird in the ocean that visibly appears unhealthy and covered in a blackish substance. Have students once again write in their notebooks and discuss what they think has happened in the photo. After discussion, show the third and final photograph on **slide 7**. This is a bird that is visibly covered in oil. Again, students write and discuss as done previously.

Now, take them back to the first photo to see if they have changed their thinking about what is happening in this first photo.

40 minutes

Explore

Formative Assess: Properties of Oil

Assess what your students know about oil and its properties. They may have observed the properties of oil in previous units on matter and its interactions. If they are not familiar with these properties, you may want to begin with some supporting experiences that explore properties of oil such, as density and viscosity (thickness and ability to flow) and hydrophobic tendency (does not mix with water).

- Tell students that crude oil is a thick dark liquid found deep underground. It is a fossil fuel, formed from the remains of plants and animals from millions of years ago. We pump crude oil out of the ground and use it to make products like gasoline and plastic. Sometimes we pump oil up from under the ocean. Crude oil is very thick and sticky. **Slides 8-9**.

Optional activities: Read to students Pages 4-17 of the book **Oil Spill by Melvin Berger** or go to Epic and use Environmental **Disasters** pages 4-7 or **Saving Animals from Oil Spills**

- *No matter what book you read, avoid reading too many details about how they clean up the oil, because this is what your students are exploring.*

Display **slide 10** and have students write down what they think the hardest part would be about cleaning up an oil spill based on its properties. Have students discuss their thoughts in groups and as a class.

Teacher's Note: Task

Students use a model to simulate an oil spill and its cleanup. They are asked to extract the "wildlife". A feather(s) is used to simulate the wildlife. They must clean the feather with as little damage as possible. Assess (through photos and by observation) the teams that complete this task. A time limit can be given for completion. Provide a list of approved supplies. A suggested list of supplies is provided with this lesson, but others can be substituted. Have students show the list of supplies they plan to use before granting them access to the supplies to start their task.

30 minutes is suggested for teams to work before calling time. Consider a 10-minute warning so that they can be at a stopping place and have all of their materials cleaned up and put up as well. The only thing remaining at the end of 30 minutes should be their tray of water and their feathers.

Extension: To provide cross-curricular instruction, give students a budget and provide prices for each item in their supply list. If you give them a budget, they should record the amounts they spend on each item.

Tell students that they will use a model to simulate an oil spill and its cleanup. Divide students into small groups of 3-4. Distribute copies of the **Data Collection** sheet. Each group of students comes up with a plan to clean up the spill and to save and clean the wildlife.

Task:

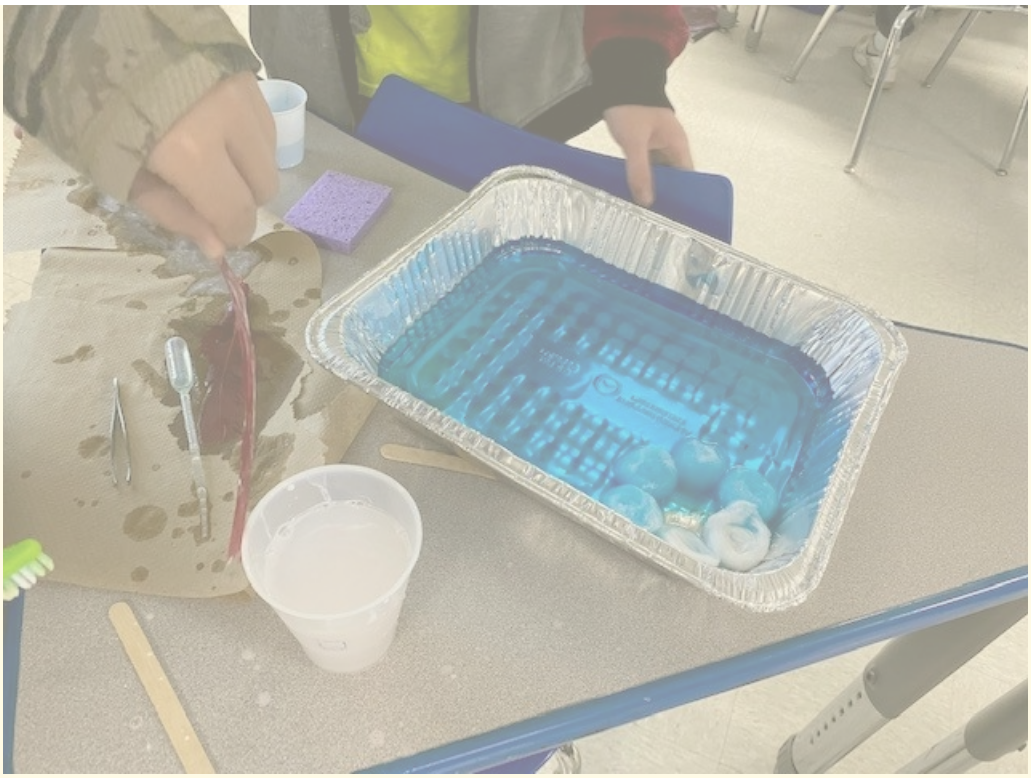
Students are challenged to clean up water by removing the oil. They are asked to extract the "wildlife" and clean the feathers with as little damage to the feather as possible. Each group records their findings on their data collection sheet. A time limit can be given for completion. Steps for the students are written on **slide 11**.

Steps:

1. Fill a pan halfway with water. *(NOTE: The disposable aluminum pans work well. You can also use blue food coloring to make it look blue like the ocean.)*
2. Pour about ¼ of a cup of oil into the water. Crude oil is not safe to work with, so use cooking oil. *(NOTE: use enough to see it but not so much that it makes the task impossible for the students.)*
3. Use a feather(s) to simulate the wildlife. Place the feather in the oil. *(NOTE: Colored feathers can be found in the craft section of department or hobby stores.)*
4. Instruct students to create a plan for clean-up using the supply list to determine what is needed.
5. Instruct students to use the plan to create a list of needed supplies. (*Students should make a plan and supply list before coming to the supply table to obtain supplies.)*
6. Once students have obtained their supplies, allow them to start working. As students are working, monitor the room and engage teams in conversation on what they are using, why, and if they are having success or difficulties. These conversations allow students to use vocabulary and share ideas. Students record their findings on the data collection sheet.
7. Consider having a bucket or tub for students to put used supplies that are reusable in to be cleaned. Since they will be oily, this will help with clean-up.
8. Instruct students to have all supplies in the trash or the clean-up bucket when time is called. They should have their ocean and wildlife out to be assessed.

Teacher's Note: Exploration Example Photos







30 minutes

Explain

Teacher's Note

Before reading the book, have students create a chart in their notebooks with four columns or use the attached **Oil Spill Organizer**. The columns should be labeled: **Type of oil spill**, **Method used for clean-up**, **Pros of using this method, and Cons of using this method.**

Read aloud or have students read, individually or in pairs, a book such as **Oil Spill by Melvin Berger** or go to Epic and use **Environmental Disasters** or **Saving Animals from Oil Spills.**

As students work through the book, they should record the information in their chart and write key vocabulary words on two or three sticky notes. They need these notes for the whole group discussion.

Facilitate a whole group discussion. Have a chart available for students to add key vocabulary words.

Possible discussion questions:

- *What did you learn about the types of oil spills?*
- *What methods and materials were used to clean up the animals and water?*
- *What surprised you about cleaning up an oil spill?*
- *Which method do you think works the best? Why?*
- *Were there any advantages to any of these methods?*
- *How did the tools in our simulation experiment compare to the actual tools?*
- *Can you propose any new methods for cleaning up oil spills?*
- *Did the oil spills get thoroughly cleaned up? What about your oil spill clean-up? Did you complete the job?*
- *What key vocabulary words do you need to know to discuss oil spills and their clean-up with others?*
- *Imagine you are cleaning a real, live animal that has been oiled. Using the results from your experiment and the reading, what things would you do to keep you and the animal safe?*

Optional: **Slides 12 and 13** show oil spills around the world and a large oil spill that needs clean-up.

30 minutes

Extend

Revisit the Essential Question on **slide 14**: **How can we as humans reduce our impact on Earth?**

As a class, brainstorm types of pollution found on Earth. Add student ideas to slide 14, which has oil spills and air as examples. Next, group students into four or five groups. Using the Jigsaw strategy, assign each group a different type of pollution to research. You can provide the articles or send them to a safe web browser such as Kiddle.co to research on their own.

Display **slide 15.** Students record their information using the 3-2-1 strategy (three things you learned, two questions you have, and one thing you can do to prevent this type of pollution). After students have presented to the class, have them post the 3-2-1s in the room and encourage interested students to do more research to answer the questions posed.

Display **slide 16.** Focus points during the class discussion should include.

- How can people prevent damage from oil spills and other types of pollution?
- How do they, the students, play an important role in the impact on our Earth.
- How can they help protect our Earth?

20 minutes

Evaluate

Display **slide 17**. Have students write a two-paragraph summary.

The first paragraph should address the oil spill simulation experience.

- Was there something you would change in your experiment to have a better outcome of cleaning the oil?
- Is there a material or tool that you feel would have worked better or one you would have liked to test? Why?
- How did this experience relate to a real-life oil spill?
  2nd paragraph
- Students write about how they play an important role in the impact on Earth.
- How can they help make things better?

Opportunities for Gifted Learners

Is it True?

Have students choose an infographic from the **Infographic** packet to analyze. There are four attached to this lesson, also available on **slides 18-21.** Consider choosing or having students find other examples.

Have students use the strategy Justified True or False to make a chart and list facts from the infographic and decide whether they think the statements are factual or false. The exciting work comes in when they are tasked with finding the research to prove their decisions.

Resources

- Cover image: https://www.ecowatch.com/wp-content/uploads/2021/10/738327313-origin-1024x576.jpg
- Epic. (n.d.). Epic!. Epic Creations. https://www.getepic.com/
- K20 Center. (n.d.). 3-2-1. Strategies. Instructional Strategies. https://learn.k20center.ou.edu/strategy/117
- K20 Center. (n.d.). Jigsaw. Strategies. https://learn.k20center.ou.edu/strategy/179
- K20 Center. (n.d.). Justified true and false. Strategies. https://learn.k20center.ou.edu/strategy/174
- Berger, Melvin. (April 1, 1994). *Oil Spill*. Harper Collins.
- Person, Stephen. (n.d.). *Saving Animals from Oil Spills.* https://www.getepic.com/book/56387696/saving-animals-from-oil-spills