wellness activity guide

Unit 4: Living In My Community (Environmental)

ages 13–15

Oregon ASK
Afterschool & Summer for Kids Network

OHSU
EROSION

**ACTIVITY DESCRIPTION:** Erosion is the wearing away of soil and rock, and the down-slope movement of soil and rock. Some factors that influence erosion include gravity, glaciers, water, wind, ice, and waves.

During the process of erosion, chemicals from farming which are contained in the soil, are washed into our waterways, causing pollution. Soil erosion is a worldwide environmental problem with up to 80% of the world’s agricultural soils affected. It takes a long time for soil to form from the breaking down of rocks and organic matter. Without soil plants can’t grow. Soil must be protected from erosion to preserve our futures.

**SUPPLIES:**
- 3 pans or plastic containers
- Pitcher of water
- 3 cups of sand*
- Styrofoam cup
- Writing Utensil
- Notebook
- Tissue

*If you don’t happen to live near a beach, you can actually buy the sand! Most pool and sporting good stores carry sand that is often used to weigh objects down.

**STEPS:**
1. Ask students what they know about erosion. Hold a discussion using the background information above, about how erosion happens and why it matters.
2. Assign students into small groups and/or teams. Each team will need a set of the supplies from the above list.
3. Once students are in their groups and have their supplies instruct them to lay the three pans about 6 inches apart.
4. Then they will pour one cup of sand into the middle of each pan.
5. Shape two piles of sand into small mountains in the center of the pans. Smooth the third pile of sand so that it covers the whole area of the pan (you may need more sand for this).

6. Predict what you believe would happen if rain fell on one of your mountains and what would happen if it fell on the flattened sand. Write your predictions in your journal.

7. Make a small hole in the bottom of your Styrofoam cup. Place your finger over the whole and fill the cup about one-halfway with water from the pitcher.

8. Hold the cup approximately 12 inches above the center of your smooth pan. Move your finger so that the water trickles out through the hole of the cup. When the cup has emptied, set it aside and record the results of what happened to the sand in your journal.

9. Repeat the same procedure in step 6, but this time on one of the pans with the mountain of sand. Don’t forget to fill the cup one-half with water and hold it 12 inches from the center of the mountain. Record the results of what happened to the mountain in your journal.

10. Cover your second mountain (the third pan now) with your tissue. The tissue will represent the plants and brush that would grow on your mountain. Fill your cup one-half with water and let it trickle out above the tissue-covered mountain until the cup is empty. Again, record your results in your journal.

11. How did the shape of the land influence the amount of erosion that took place? How did the tissue covering the mountain affect the rate of erosion? Of the three pans, which one resulted in the most erosion? Which resulted in the least?

HOW TO EXPAND:
- Explore National Geographic’s site and list out all the types of erosion that you’ve seen in your local area. How does this affect the people living in the area?
- Read through World Wild Life’s page on Erosion. How could the impacts of erosion affect humans on a worldwide scale?

ADAPTATIONS/GOING VIRTUAL:
This activity could be done from home.
DISCUSSION QUESTIONS:

- The sand formation with the tissue demonstrates how the trees, brush, and natural occurring elements help to form a bond on the earth. They protect the soil from rapid erosion, acting almost like a glue that keeps the earth together. Without these elements present the soil erodes at a much quicker pace.
ENVIRONMENTAL JUSTICE

ACTIVITY DESCRIPTION: In this activity, students will be introduced to environmental justice by considering a North Carolina case study that involved a hazardous waste landfill and is often credited with launching the national environmental justice movement. This lesson follows the 5E inquiry model, using engagement, exploration, explanation, elaboration, and evaluation to promote student learning.

SUPPLIES:
- Real People–Real Stories: Seeking Environmental Justice – Afton, NC (Warren County), Handout – provided
- Consumer Tool For Identifying Drinking Water Filters Certified To Reduce Lead Handout – provided
- Pencil/Writing Utensil
- Paper

STEPS:
1. Provide copies or read the following excerpt to your class, and ask students if they can identify any community concerns that might arise as a result of this situation.

   “Over 30,000 gallons of industrial waste containing the hazardous chemical polychlorinated biphenyl or PCB were deliberately discharged along approximately 243 miles of highway shoulders in 14 counties of North Carolina. Because of the quantity of soils involved and the distances to approved landfills, the State has decided to construct a new landfill in order to dispose of this hazardous waste.”

   “Let’s imagine that we live in a small town where the population is approximately 1,300. Sixty-nine percent of the residents are nonwhite and 20 percent of the residents have incomes below the federal poverty level. The town is an economically-depressed community. A 142-acre tract of land on the east side of town has been identified by the state as the resting place for the 60,000 tons of soil highly contaminated with PCBs. PCBs are a class of chemicals that have been determined to be hazardous to human health and reproduction. This PCB–contaminated soil will be placed into a hazardous waste landfill, as permitted by EPA regulations, which will not be used for the disposal of other wastes.”
The EPA eliminated the following requirements in order for the landfill to be built here: requirement for 50 feet between the landfill and groundwater, requirement of an artificial liner, requirement of an underliner leachate collection system.”

2. Conclude any class discussion by revealing the problem to be addressed by this activity: community leaders who are upset about this situation believe that the landfill site was intentionally selected due to its being located in a poor, rural, predominantly minority community. They are determined to fight this decision and prevent the landfill from being constructed.

3. Tell the students that now they are going to consider this story from different perspectives and identify the various groups who are involved in this story and will identify actions each group can take to address this problem and predict how this story might end.

EXPLORATION

4. Have students draw a “T” chart on a piece of paper; draw a “+” sign in the left hand column of the chart and a “−” sign in the right hand column. Ask students to consider how the community might be both positively and negatively affected by the siting and construction of the PCB Landfill. Do not worry about right or wrong answers, just record ideas based on what students know. Students might need to be prompted to consider the potential positive and negative effects of this landfill on:
   ● The local economy (job opportunities)
   ● Society/Social well-being (living conditions)
   ● Public health (Overall community infrastructure (schools, roads, emergency services, etc.)

5. Next, ask the students to identify the key groups in this story and brainstorm actions each key group (see list below) could take to address this problem. At this point, do not worry about right or wrong answers, just record actions based on what students know about each group – it is not important that they come up with lots of answers for each group. Record student answers on the board and conclude by asking the class to predict reasonable solutions to this problem:
   ○ Concerned Citizen Group(s) e.g., those who live near the proposed site
   ○ Media
   ○ Scientists/Public Health Experts EPA (Federal Government)
   ○ NC Department of Natural Resources (State Government)
   ○ Town and County officials (Local Government)
EXPLANATION

6. Tell the students that the scenario they just envisioned actually happened in North Carolina and invite students to read the summary titled Real People-Real Stories: Seeking Environmental Justice - Afton, NC (Warren County) to find out the outcome of this story and how these various groups responded.

7. Once students have read the summary, allow students to evaluate how closely their brainstormed ideas of group actions from step 5 matched what was actually described in the story. This may provide you with the opportunity to emphasize the different and sometimes collaborative roles played by each group in the actual case study.

8. Next, revisit the “T” chart the students made; ask them to reflect on how the community of Afton was both positively and negatively affected by the PCB landfill. Ask students to compare their previous predictions from step 4 with what actually occurred.

9. Next, ask the class to describe the demographics (race/ethnicity, income, age, employment statistics, education level, etc.) of the community affected. Ask the class to discuss the evidence that race and income level were used as criteria for siting the landfill in Afton, NC.

ELABORATION: DEFINING ENVIRONMENTAL JUSTICE

10. Conclude this activity by introducing the phrase environmental justice and asking students to speculate on its meaning; have students list ideas on a piece of paper and share out ideas. Have them note/circle words or concepts that are repeated to help students work towards developing their own definition of environmental justice.

11. Finally, reveal EPA’s definition of environmental justice (EJ) as: “the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.” You may want to elaborate on Environmental Justice by offering the 17 Principles of EJ that “have served as a defining document for the growing grassroots movement for environmental justice.” These principles were adopted by the delegates at the First National People of Color Environmental Leadership Summit held in October 1991.
12. Conclude by asking:
   ○ Why should the general public be informed about local hazardous waste (HW) sites and what should the role of government be in this process?
     i. HW sites can lead to contaminated ground and surface water, which can affect drinking water quality and local wildlife.
     ii. Clean up of HW sites can impact local communities and wildlife.
     iii. Government agencies should inform the public of HW sites and should provide accessible resources for citizens concerned about exposure and impacts.

HOW TO EXPAND:
● Have students debate the case study during a “town hall meeting” with all of the key players (e.g., media, community, company/polluter, EPA, etc.) at the meeting. Ask students to read the detailed case study (available on Exchange Project’s website) and perhaps review related (PCB contamination) cases to adequately prepare their parts for the debate.
● Invite someone who works in the EJ community to visit the class and discuss a local past or present EJ issue. This could include the siting of a landfill or wastewater treatment plant, a Confined Animal Feeding Operation (CAFO), etc. Have students compile questions for the speaker ahead of time.

ADAPTATIONS/GOING VIRTUAL:
This activity can be done at home with family members.

DISCUSSION QUESTIONS:
● What federal, state, and local agencies exist to protect the environment and human health? (answer: EPA, NCDENR, NCDHHS, County Health Departments)
● What are environmental justice issues you’ve heard of previously? What were the main issues of the events? How was it handled? What could have been done differently?
● What strategies can community members use to address environmental injustices?
**EPIDEMIOLOGY**

**ACTIVITY DESCRIPTION:** This activity looks at what Epidemiology is and why it’s important. The activity will introduce participants to how epidemiology was discovered.

**SUPPLIES:**
- Access to internet

**Steps:**
1. Show students the **John Snow: Pioneer of Epidemiology** Video. This dramatization recounts the beginnings of epidemiology and how one doctor developed a systematic process employing logic, statistics, and mapping to determine the cause of a cholera epidemic that killed hundreds of people in London in the summer of 1854.

2. Ask students to define what the term *public health* means. Then ask them how they would get information about events, behaviors, or environmental conditions that affect public health. Explain to the class that today a number of different parties play a role in safeguarding the public health, including medical practitioners (e.g., doctors, nurses), administrators, investigators, laboratory workers, and, as shown in the following video, veterinarians and wildlife pathologists. (Pathologists are specialists who study the nature of diseases, especially the structural and functional changes produced by them.)

3. Show students the **Mystery Illness in New York City** Video. It describes the beginning of a more recent disease outbreak whose unknown origin threatened to cause panic throughout the city of New York. It also highlights the first few steps of a public health investigation. You may point out to students that a public health investigation starts with a question. For John Snow it was, How do people become sick with cholera? In the case that follows, the question is, Why are the crows dying? Investigators then decide what data to collect, analyze the collected data, make claims based on the evidence they find, and provide explanations. You may also reinforce the idea that, as is often the case in science, investigations can be complicated and steps may not follow a prescribed order.
4. Focus on epidemiology and the role of an epidemiologist. First, review definitions. (Epidemiology is the study of diseases as they occur in living things. It focuses on understanding the transmission, spread, and control of diseases. An epidemiologist, like Annie Fine, the New York City public health worker who appears in the video, is a scientist who investigates the factors that cause disease.) Then ask students to relate what they saw in the video to the process epidemiologists use in their work: epidemiologists go into outbreak areas, interview people, and gather data. This helps them either form a hypothesis that may explain the outbreak, or prove or disprove a hypothesis they already have. To organize the discussion, you may ask:

- Whom did New York City public health workers interview when they began their investigation? What questions did they ask?
- What did they suspect might be responsible for transmitting the disease to the human population? How did they come up with this idea?
- What did the investigators do next to test their hypothesis?

**HOW TO EXPAND:**
- Learn how your state’s public health department is educating the public about lowering the risks of disease. Locate its Web site (in a search engine, type in your state name and “health department”), then search within the site for West Nile virus.

**ADAPTATIONS/GOING VIRTUAL:**
Activity can be done from home.

**DISCUSSION QUESTIONS:**
- Why do you think mosquito breeding could be relevant to a disease investigation?
- Do you know of any diseases spread by mosquitoes?
- How does knowledge of how a disease spread help your community?
ENVIRONMENTAL MENUS

ACTIVITY DESCRIPTION: Does Buying Local Matter?

SUPPLIES:
- Writing Utensil
- Paper
- Food Guide Charts - provided

STEPS:
1. Begin by asking students a question: How does buying prepackaged products or food that is out of season affect the environment?
   a. Answer: Additional fuel costs for transport as well as environmental impact of that transport, additional packaging and preservatives with an environmental impact, financial impact as it costs more out of season and with packaging, etc.
2. Tell students that they are being challenged to help save the environment one meal at a time.
3. Explain that you have a list of seasonal foods that are available at a local market (stand/farmer’s market).
4. Have students create a menu for an entire week (two to three meals daily) that uses only items that are seasonal (this does not include spices or basic ingredients). This can include meats if during the season in which the meat is most readily available.
5. Allow students to use the computer to find simple recipes to share with their menu items.

HOW TO EXPAND:
- Have students create a chart/graph on three different food products that compare the cost of transporting it, packaging, and labor to the nutritional value in that particular product.
- Visit your local farmers market and make a list of all the available products with the general cost of each. Then go to the grocery store that you normally visit and compare the prices of products from the farmers market to the store.

ADAPTATIONS/GOING VIRTUAL: Activity can be done from home.
DISCUSSION QUESTIONS:

- How does supporting the local farmers market help your community?
- When buying fruits and vegetables at the grocery store which is more economically friendly and overall healthier? Frozen, Fresh, or Canned? Why do you think that?
- Some places live are food deserts – a place with no grocery stores that sell healthy food and people often have to rely on convenience stores and/or drive miles out of their way to buy food. How does this impact the community living there?
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**Note:** The table above lists various vegetables, with an 'x' indicating their presence. The number of columns indicates the number of weeks or periods in the activity.
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<td>Red raspberries</td>
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<td>Rhubarb</td>
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<td>Strawberries</td>
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</tbody>
</table>
WATER PH

ACTIVITY DESCRIPTION: According to the United States Geological Survey (USGS) website “pH is a measure of how acidic/basic water is. The range goes from 0 to 14, with 7 being neutral. pHs of less than 7 indicate acidity, whereas a pH of greater than 7 indicates a base.” To help put pH in perspective a 0 is extremely acidic (think battery acid), and a 14 is extremely basic (think liquid drain cleaner). This activity is to explore the pH level of city water and well water and learn what their pH’s are and how that impacts the community.

SUPPLIES:
- 2 test tubes or other small container for water collection
- 20 pH strips with guide*
- Journal/notebook
- Writing Utensil
- Source of city water
- Source of well water
- Test tube labels or labeling marker**

NOTES:
*The pH strips can easily be found at your local home and garden supply store. You can use the same test strips that are used to test the pH of pools or ponds, as long as they are pH testing strips and come with a color guide that allows you to accurately determine the pH level of the water from the used strips.

**masking tape will can also be used

STEPS:
1. Ask students if they believe there is a difference between water in a city and well water. Then explain today’s activities will be finding out if the two sources of water have different pH.
2. Label one of the test tubes “City Water” and make sure you are only using this test tube for that type of water.
3. Collect one sample of water and use the pH strip to test its pH level. Record your findings.
4. Repeat step two with nine more samples of city water, for a total of ten city water samples.

5. Label the second test tube “Well Water” and make sure you are only using this test tube for that type of water.

6. Repeat steps two and three for the well water.

7. The results of the experiment depend on the information obtained from the pH strips for both types of water. Ask students:
   a. if one type of water exhibits a higher or lower pH level than the other? If so, how much of a difference was there?
   b. Were the pH levels about the same?
   c. Based on the information obtained during your experiment, which type of water do you think is the best for drinking?

HOW TO EXPAND:
- Create a graph of your findings to easily display the pH information of both the city and well water.
- Test the pH of liquids such as coffee, tea, and/or soda and compare that to the water results.

ADAPTATIONS/GOING VIRTUAL: This activity can be completed at home if pH strips are able to be purchased. If not, make predictions for each step and research each answer.

DISCUSSION QUESTIONS:
- Why would it matter if our drinking water had a pH of 5?
- Why would it matter if our drinking water had a pH of 10?
- How could acidic water impact our living environment?
  o Read about the Berkeley Pit in Montana [here].
GREENHOUSE EFFECT

Activity Description: Students consider what happens when there is more carbon than usual in the atmosphere. They then model the greenhouse effect of Earth’s atmosphere through a hands-on experiment. Finally, students deepen their understanding of the greenhouse effect by watching a short video and undertaking a reading and reflection activity.

SUPPLIES:
- Writing Utensil
- Journal/Paper
- Paper cups
- A sunny area to work, either outside or inside (or alternately a heat lamp)
- Two large plastic bags that will seal per group
- Two tablets of sodium bicarbonate per group
- Thermometers
- Timer or stopwatch

STEPS:
1. Introduce the greenhouse effect by leading a brief class discussion. Ask: What do you think happens if there is too much carbon moved from other reservoirs (or “spheres”) into the atmosphere?
   a. Students will likely have ideas around global warming or the greenhouse effect. Help them get as specific as possible about what they think is happening, as well as the causes and mechanisms, so that you can target instruction to their current level of understanding.
   b. Ask: What is a greenhouse? What does it do? How might Earth be like a greenhouse? (Correct responses: Heat comes in through the Earth’s atmosphere, but not all of it escapes, which causes the planet to get warm.)
2. Have students, either in pairs or small groups, do a brief experiment to understand the basic concept of the greenhouse effect.
3. In this experiment, students will compare the air temperatures in two bags, one sealed with added carbon dioxide from sodium bicarbonate tablets and another with no sodium bicarbonate tablets (i.e., no added carbon dioxide), as a model of the greenhouse effect.

4. Have students predict what the temperature will be inside the plastic bag with carbon dioxide compared to the bag with no carbon dioxide (higher, lower, the same).

5. Pick a spot outdoors that will be in full sunlight for at least 45 minutes.

6. Put both thermometers in direct sunlight and allow them to remain undisturbed for 3 minutes.

7. After the three minutes are up, record the temperature of each thermometer on a piece of paper with the label “Initial Temperature”.

8. Place a cup of water into one of the plastic bags. Be careful not to spill any water in the bag. Place the thermometer in the bag next to the cup. Have one person drop both of the sodium bicarbonate tablets into the cup of water. As soon as the bicarbonate has been added, seal the bag.

9. Place another cup of water into the second bag. Place the second thermometer next to it and seal the bag.

10. The bag with the sodium bicarbonate represents the greenhouse effect in our atmosphere because the sodium bicarbonate tablet releases carbon dioxide.

11. The bag without sodium bicarbonate represents our atmosphere without greenhouse gases like carbon dioxide

12. For the next 45 minutes, check the thermometers and record the temperature every five minutes in the journal/piece of paper with the initial temperature recorded.

13. When the whole class has completed the investigation, lead a discussion to debrief. Emphasize the following ideas:
   a. The bags are a proxy for the Earth’s atmosphere. The bag with added carbon dioxide represents added greenhouse gases.
b. In a greenhouse, solar energy (light) is converted into thermal energy (heat) that can’t escape the glass and thus it heats up. Incoming solar energy is mostly short wavelength (mostly visible light), and outgoing energy from the planet is mostly long wavelength (infrared).

c. Sunlight interacts with chemicals in the atmosphere and is converted into heat that remains trapped. Of the incoming solar radiation, roughly 25 percent is reflected by the atmosphere (it just bounces off and doesn’t heat anything up), 25 percent is absorbed by the atmosphere (it heats things up), 5 percent is reflected by the Earth’s surface, and 45 percent is absorbed by the Earth’s surface. Greenhouse gasses are doing more than absorbing some energy directly from the sun; they are absorbing and then reemitting heat radiating from the Earth that would otherwise be lost to space.

HOW TO EXPAND:
View a short video from PBS, Global Warming: The Physics of the Greenhouse Effect
Explain the science of why increased greenhouse gas emissions contribute to rising global temperatures.

ADAPTATIONS/GOING VIRTUAL:
This activity can be done at home with supervision

DISCUSSION QUESTIONS:
- How does greenhouse gasses affect humans?
- How do extreme temperatures affect human health?
- How do you think the actual greenhouse effect is different from the experiment?
- What strategies can you think of that would help reduce the negative effects of greenhouse gases?
GEOGRAPHY OF A PENCIL

ACTIVITY DESCRIPTION: Countries around the world offer a wide range of trades and distribute specific resources that go through many travel routes to end up at the final destination. In this activity we’ll be learning about the travel route various components of a pencil take to get into our hands!

Globalization: The connection of different parts of the world resulting in the expansion of international cultural, economic, and political activities.

SUPPLIES:
- Dry erase markers
- Markers or colored pencils
- Paper
- Wood Pencils
- Atlas
- World Mega-Map Handout– Provided

STEPS:
1. Discuss the component parts of a pencil and distribute pencils to students.
   a. Ask: What materials or natural resources do you think make up a pencil? Organize student ideas on the board.
   b. Discuss students’ ideas while comparing them to the information in Table 1 on the handout. Describe each of the component parts of a pencil while pointing to each of the materials.
2. Discuss the geographic origins of the materials used to make a pencil.
   a. Ask: Now that you know the different materials in a pencil, where do you think all of these materials originate?
b. Explain to students that these materials come from all around the world, and that many countries contribute different materials used to make a pencil. Show students Table 2 and explain that the countries included are the top producers of these materials. Tell students that these five materials come from many different areas, but that the countries listed on the handout are some of the top producers of the materials. Using a world atlas for reference, have students identify these countries on the Mega-map handout, and have them label the countries with the product name.

3. Divide students into country groupings.
   a. Divide students into six groups, with each of five groups representing one of the countries where each of the materials is made. Assign the sixth group to represent the United States, or the country in which you live. Have each group make a sign with its country name.
   b. Have students also include the country flag, if time permits. Tell groups of students (except the United States group) that they represent a company in that country that wants to build a factory to produce pencils, but they need to figure out how to get the other materials to make a pencil. Tell the United States group that they are the consumer and need to purchase finished pencils for their company to distribute to schools in the United States.

4. Brainstorm methods of moving goods around the globe.
   a. Ask groups to brainstorm and write a list of the different methods of transportation that are used in trade to move goods around the world. Invite each group to write on the board one of the methods they have listed. As a whole class, discuss some of the benefits and challenges of the different methods of transportation. Organize this list in a chart that everyone can share or see.
   b. As part of this exercise, ask:
      i. *How fast are the different methods?*
      ii. *How much of a good can be transported at one time?*
      iii. *What other factors might affect the use of a method?* Encourage students to think about the costs of fuel to power the ship, plane, train, truck or other vehicle. Other factors students may identify or recognize include political disputes or environmental hazards.

5. Have groups use their maps to create networks of transportation.
a. Explain that students will next create a plan to make and sell their company’s pencils. Students will need to use the map to determine where they can get the necessary materials. Have them work on the map to create a materials flow chart using lines, arrows, and symbols to show where they plan to get materials and how the materials will get to them.

b. Then have students use arrows, lines, and symbols to show how they plan to move their products to the United States. Have each group use a different color to represent their company’s materials transportation plan. Have the United States group do a similar exercise, but limited to how they can potentially get pencils from each of the countries. Tell the United States group that they will later have to pick one of the companies from which to purchase pencils.

6. Have groups present their plans and discuss

   a. Have each of the five groups present their plan to the class. Have the sixth group—the United States or the country where you live—take a moment to decide which company’s pencils might be the best option for them to purchase. Then have them explain why. Allow students from other countries to try to convince the buyer country to purchase their pencils instead. Encourage students to reflect on how the countries are connected through the pencil production process.

      i. Ask: In what ways does the United States (or the country in which you reside) depend on other countries for the pencils we use? What other products can you think of that might be, like the pencil, “connected” to more than one country?

HOW TO EXPAND:

● Point out to students that many resources from many different countries are needed to make even the most simple, everyday objects. Have students check the labels on their clothing to see where they were made. Then ask them to use markers to plot the locations on the map.

ADAPTATIONS/GOING VIRTUAL: This activity can be completed from home using zoom or instead of working together with classmates, you can complete this activity on your own or with family members.
DISCUSSION QUESTIONS:

- Where do you think parts for a mechanical pencil come from?
- Why do you think it’s important for countries to work together?
- Find 3 items in your home – can you figure out where they were made? Sometimes they have stickers that say where they’re from.
### Table 1. What is a Pencil Made Of?

<table>
<thead>
<tr>
<th>Material</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graphite</td>
<td>A gray to black, opaque mineral that is soft enough to leave a black mark. Graphite is used to make the writing cores of pencils.</td>
</tr>
<tr>
<td>Wood (Softwood)</td>
<td>Softwoods are coniferous trees, such as pines or spruces. Cedar wood is most commonly used in pencil production. The wood encases the graphite, making it easier for the writer to hold.</td>
</tr>
<tr>
<td>Point</td>
<td>The point is the yellow casing around the pencil. It is used as both a protective and decorative coating. Non-toxic point is usually used in pencil production.</td>
</tr>
<tr>
<td>Rubber</td>
<td>Rubber is used to make the erasers of the pencil. It is derived from certain tropical plants and is an elastic substance.</td>
</tr>
<tr>
<td>Metal (Aluminum)</td>
<td>Aluminum is used to make the metal ferrule that is attached to the end of the pencil and holds the eraser in place. It is a lightweight metal, and its compounds are very abundant on Earth.</td>
</tr>
</tbody>
</table>

### Table 2. Where do Pencils Come From?

<table>
<thead>
<tr>
<th>Material</th>
<th>Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graphite</td>
<td>Brazil, Mexico</td>
</tr>
<tr>
<td>Wood (Softwood)</td>
<td>Sweden, South Africa</td>
</tr>
<tr>
<td>Point</td>
<td>Kazakhstan, Estonia</td>
</tr>
<tr>
<td>Rubber</td>
<td>Thailand, Malaysia</td>
</tr>
<tr>
<td>Metal (Aluminum)</td>
<td>China, Mozambique</td>
</tr>
</tbody>
</table>
CREDIT/SOURCES:

EROSION


ENVIRONMENTAL JUSTICE


EPIDEMIOLOGY


ENVIRONMENTAL MENUS

1. Adapted from: https://www.teacher.org/lesson-plan/menus-to-save-the-earth/
2. Charts: https://oregonfresh.net/local-products/whats-in-season/

WATER PH

1. Adapted from: http://www.sciencefairadventure.com/ProjectDetail.aspx?ProjectID=130

GREENHOUSE EFFECT

1. Activity Inspiration From: https://www.nationalgeographic.org/activity/greenhouse-effect/

GEOGRAPHY OF A PENCIL

1. Adapted from: https://www.nationalgeographic.org/activity/geography-of-a-pencil/
A Consumer Tool for Identifying Point of Use (POU) Drinking Water Filters Certified to Reduce Lead

How do I know if a POU filter has been certified to reduce lead?

There are several American National Standards Institute (ANSI) accredited third-party certification bodies that evaluate POU drinking water filters for lead reduction. Each has a registered trademark that is used on certified products.

Certification bodies require their mark and a statement indicating testing against NSF/ANSI Standard 53 along with a claim of lead reduction. We recommend that you also look for filters tested against NSF/ANSI Standard 42 for particulate reduction (Class I)*.

The table below provides the certification bodies’ approved marks and the text that indicates a filter has been certified for lead reduction capabilities. Some filters can be certified by more than one certification body and have multiple certification marks.

<table>
<thead>
<tr>
<th>Certification Mark(s)</th>
<th>Product Listing Directory</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSF®</td>
<td>info.nsf.org/Certified/DWTU/</td>
</tr>
<tr>
<td>NSF®</td>
<td>wqa.org/Find-Products#/</td>
</tr>
<tr>
<td>IAPMOR&amp;T</td>
<td>pld.iapmo.org/</td>
</tr>
<tr>
<td>UL® Certified</td>
<td>database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.html</td>
</tr>
<tr>
<td>Text for NSF/ANSI Standards 42 &amp; 53 next to certification marks:</td>
<td></td>
</tr>
<tr>
<td>• Example text on packaging: Tested and Certified by (name of certification body) against NSF/ANSI Standards 42 and 53 for the claims specified on the Performance Data Sheet.</td>
<td></td>
</tr>
<tr>
<td>• Some companies may indicate lead removal in the text, or might simply state NSF/ANSI 53 or NSF/ANSI 42 above or below the mark.</td>
<td></td>
</tr>
</tbody>
</table>

Is certification required for POU drinking water filters?

There is no mandatory federal requirement for the use of POU drinking water filters or for testing or third-party certification under the Safe Drinking Water Act. However, consumers can increase their level of confidence by purchasing filters that have been tested by an accredited third-party certification body or bodies for lead reduction and particulate reduction (Class I) capabilities against both NSF/ANSI Standards 42 and 53.

*Although particulate reduction (Class I) is for aesthetic effects, it is being suggested since some particulates can contain lead.

Disclaimer: This document is for informational purposes only. Any mention of trade names or commercial products does not constitute EPA endorsement or recommendation for use.
Certification Marks, Standards Text, and Claims of Reduction on Filter Packaging
Certification marks are detailed in the Table on Page 1. Examples of certification marks, NSF/ANSI Standards 42 and 53 text, and claims of lead reduction and particulate reduction (Class I) as found on product packaging are shown below.

Where are the certification marks and Standards text located?
The certification marks can be found on the filter or on the smallest container in which the filter is packaged. NSF/ANSI Standards 42 and 53 text will be located under or near a certification mark. If lead reduction and particulate reduction (Class I) are not specifically mentioned in the text, information can be found in a table on the packaging, on the performance data sheet located inside the filter packaging or on the manufacturer’s website, or in the certifier’s online product listing directory (see links in the table on Page 1).

Performance Data Sheet Inside Filter Packaging or on Websites
Claims of lead reduction and particulate reduction (Class I) not included on the filter packaging can typically be found on the performance data sheet located inside the filter box or other packaging (example below), or on the manufacturer’s website.

Additional Information
- EPA’s Lead in Drinking Water Website: epa.gov/ground-water-and-drinking-water/basic-information-about-lead-drinking-water
- Understanding NSF/ANSI Standard 53: workingpressuremag.com/understanding-nsf-ansi-53/

Questions?
- For questions about a filter: Contact the product manufacturer or see the product listing directories listed on the first page.
- For questions about this document: Send an email to latham.michelle@epa.gov or shah.manthan@epa.gov.

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