

Video Lesson Plan 4B—*Water Pollution: The Dirty Details*

“Water Words and Water Quality”

Subject/Grade Level: Language arts and vocabulary for grades 6–8

Objective: Introduce the vocabulary strategy *Ten Most Important Words*, and use it to increase student vocabulary, understanding, and word use.

Rationale: A larger vocabulary increases reading fluency and comprehension.

Standards:

- LA.6.1.6.2, LA.7.1.6.2, LA.8.1.6.2: The student uses multiple strategies to develop grade appropriate vocabulary.

Background/Links:

- Find out more about this vocabulary strategy and other learning strategies from the Florida Online Reading Professional Development Resource Database (FOR-PD) at <http://forpd.ucf.edu/resources/>.
- Learn more about developing vocabulary in *Bringing Words to Life* (Beck, McKeown, Kukan, 2003).
- Find out more about St. Johns River Water Management District and managing water quality at www.sjrwmd.com/education/pdfs/WQ_in_classroom.pdf.
- Find related language arts activities about water, educator resources, and links for Project WET at www.sjrwmd.com/education.

Lesson Plan

Pre-assessment (10 minutes): Pass out copies of the student page. Instruct students to fill out all of the boxes in the column “What you already know about this word.”

Engage (3–5 minutes): Tell the students they are going to learn more about water pollution today. Ask them the following questions:

- When you hear the words “water pollution” describe what your mind sees: what colors, what objects, what motions?
- How does it smell? In your mind, pick some up and feel it.
- How does it feel? Is pollution something you can always see, smell, or touch?
- Tell them that many times we hear words and know what they mean—somewhat. However, when the words are used in different ways, in talking or in a textbook, those words can mean different things depending on how they are used.

Explore/Explain (20 minutes):

Watch the DVD and instruct students to write down what they hear or learn about the vocabulary words on the student page and their meaning. It is important for students to write in their own words. Prompt students to include

Time: 25–30 minutes

Materials:

- *Water Pollution: The Dirty Details*, video (8 minutes), from the *Your Water Resources* DVD, St. Johns River Water Management District, 2006, or available to download free at www.sjrwmd.com/video/index.html
- DVD player
- Copies of *Ten Most Important Words* vocabulary strategy paper

Video Lesson Plan 4B—*Water Pollution: The Dirty Details*

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specifics when needed. Warn them that the video goes fast, so they need to pay close attention. Pause the DVD every few minutes to allow students time to write.

See attached teacher page for the answer key. After viewing the video, discuss what the students found out about each word. It is important to clarify and specify the meaning of the word in the context of the video.

Extend (12–18 minutes): Use the strategy page to extend student knowledge of the meanings and extend this knowledge to other applications.

Extensions: Do the following activity from the *Project Wet Curriculum and Activity Guide*:

- “Sum of the Parts” is an activity that illustrates how a water body such as a river can become polluted from both point and nonpoint sources through the students’ creation of different uses for the land along a riverfront. It highlights best management practices for nonpoint source pollution.

Evaluate/Post-assessment (5 minutes): Instruct students to choose three or four of the words and write down all the new things they learned about the word.

Video Lesson Plan 4B—*Water Pollution: The Dirty Details*

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TEACHER PAGE

Vocabulary Word	What new things/ideas you learned about this word?
Water quality	Possible answers: (1) Enough clean, usable water for the plants, animals, and people. (2) Means different things to different users—fishermen want water that has lots of healthy fish with places to spawn; boaters want open water that isn’t clogged with plants or debris; homeowners want water that is safe to drink and plentiful enough for their homes and yards.
Hazard	Possible answers: (1) Hazard means something causing unsafe conditions. (2) Hazardous means conditions could be unsafe, so be careful. (3) Things floating in the water such as lots of plants or debris are a <u>hazard</u> to boaters.
Pollution	Possible answers: Harmful chemicals or waste materials that contaminate the water; source can be natural, or by people Two types of pollution: (1) Point source: easy to identify, from one source, regulated by state and federal laws. (2) Nonpoint source pollution: comes from many sources or a wide area, often carried by rain. Synonym: Contaminated, unclean
Nonpoint	Possible answers: Used to identify pollution that doesn’t come from one source.
Contamination	Possible answers: Adding something to another substance that makes the original substance unhealthy, or it doesn’t work correctly; <u>contaminants</u> are often <u>hazardous</u> .
Sediments	Possible answers: Bits of soils, leaves, other solids that are washed or blown into water bodies Consequences: Blocks sewers and storm drains causing flooding; makes lakes and streams shallow; blocks gills of water animals and covers eggs so they don’t hatch. Common misconception: Sediments are natural so they cannot be a pollutant.
Nutrients	Possible answers: (1) Means food, also the things needed in food for growth. (2) Too many nutrients in water causes plants and other things in the water to grow too fast, clogging waterways, and making them unmanageable. Sources of nutrients: Sewage, animal wastes, detergents, industrial wastes, fertilizers Common misconception: Since nutrients give you the energy and materials needed to grow, they are always good.
Bacteria	Possible answers: (1) Microscopic living things in water (and most other living things and places) that can be helpful (decomposing sewage and oil) or harmful (using up most of the oxygen in water so water plants and animals suffer or die; also causing diseases spread through water). (2) Sources of bacteria: sewage, runoff from animal wastes, slaughter houses, paper processing plants, landfills. Common misconception: Bacteria are germs so they are always bad.
Toxic	Possible answers: (1) Harmful substances like chemicals found in pesticides, poisons, turpentine, and heavy metals like mercury, lead, copper, or zinc. (2) Often point source pollution from factories like underground gasoline tanks. (3) May be non-point sources like farm or neighborhood storm runoff, car or factory exhaust.
Pesticide	Possible answers: (1) Something used to get rid of or reduce or kill a pest; a pest is something causing a problem or annoyance, a pest could be a living thing. (2) Usually applies to a chemical used to kill living things that are eating our lawns or crops or causing damage or disease in crops, lawns, or homes

Video Lesson Plan 4B—*Water Pollution: The Dirty Details*

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STRATEGY PAGE TO EXTEND VOCABULARY USAGE

Ask questions or use the following strategies to help students activate previous knowledge.

Vocabulary Word	Vocabulary Strategy
Water quality	Strategy 1: What did the word <u>quality</u> mean when you’ve seen it before? How does the quality of the water affect fishermen, boaters, homeowners? Before you swim in a stream or river or eat fish from the river, what should you know about the water quality? Name three or four things from the video that influence water quality.
Hazard	Strategy 1: What other things in water could be a hazard to boaters? (other boats or boaters, lots of boat traffic, bridges, or submerged pilings.) What things did you see in the video that may be hazards when they wash into our rivers and streams? (Detergents, chemicals, animal wastes, or nutrients. Have you heard about or seen a hazardous materials spill on TV? What things could be hazards to students at our school? Have you ever done anything on your skateboard or bike that was hazardous? Strategy 2: What are some antonyms for hazard or hazardous? (Safety, secure, harmless) What are some synonyms? (Risky, dangerous) Strategy 3: Word analysis. Have you ever seen the word <u>hazard</u> as a root word with a prefix or suffix? (Biohazard—bio means life; so what does biohazard literally mean?) Where have you seen this word or a similar word? (Doctor’s office, on the sides of trucks carrying hazardous materials)
Pollution	Strategy 1: Enhance student understanding by asking questions about how the word <u>pollution</u> is used in this and other situations. How could you tell if water is polluted? (trash, smell, green scum) Can you always tell if water is polluted by looking? (It isn’t always immediately obvious.)
Nonpoint	Strategy 1: Word analysis. “Non” is a prefix meaning “not” and “point” has many meanings, one of which is a position or place. What other words do you know that have the prefix “non”? (Nonverbal, nonviolent, nonsense, nonfiction). What does noncompliance mean? How is that word used in regulations about pollution control? A company or individual that doesn’t follow regulations about toxic emissions is in noncompliance with the regulation.
Contamination	Strategy 1: Enhance student understanding by asking questions about how the word <u>contamination</u> is used in this and other situations. How does the river water become contaminated in the video? When the pest control person sprays your home for bugs, why do you have to cover up your fish tank and put away all food? If a truck over turns and spills diesel fuel, how might the fuel contaminate a nearby pond? (It could be washed off the road by rain and into a pond.)
Nutrients	Strategy 1: Clarify what nutrients are. Can you name some nutrients for humans? (Vitamins, proteins, carbohydrates, fats, minerals) How do humans get nutrients? (eating food) What happens when humans get too much food? (They gain weight, get fat.) Name some nutrients for plants. (They make their own food by photosynthesis, but need minerals, and nitrogen from fertilizers, and phosphates from fertilizers and detergents.) What happens when plants in the water get too many nutrients? (They grow and reproduce faster, possibly taking up all the available space and then dying when it is too crowded.)
Sediments	Strategy 1: Enhance student understanding by asking questions about how the word <u>sediment</u> is

Video Lesson Plan 4B—*Water Pollution: The Dirty Details*

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	<p>used in this and other situations. Have you ever had sediment in your iced tea? How about in your salad dressing? Can you think of a synonym for sediment? (Silt—is silt exactly like sediment? How is it different? Same?)</p> <p>Strategy 2: Word analysis: Dissect the word sediment into syllables. The root “sed” means “sit.” Sediments sit on the bottom of a ditch, creek, or stream. What does sedentary mean?</p>
Bacteria	<p>Strategy 1: Are bacteria always bad? (No.) What kinds of bacteria might be in animal wastes or sewage? Why might bacteria from slaughterhouses cause a problem?</p>
Toxic	<p>Strategy 1: Enhance student understanding by asking questions about how the word <u>toxic</u> would be used in other situations. Are poisons always toxic? Is pollution always toxic? Is fertilizer toxic? Sometimes toxic is not a matter of what, but how much. For example, vitamin A is good for you, but in large doses, it is toxic!</p>
Pesticide	<p>Strategy 1: Teach word analysis to enhance student understanding. For example, give a simple definition of pest (no dictionary or glossary definitions allowed) with synonyms and examples (fungicide, insecticide). The suffix –cide means “to kill.” Make up a new word meaning “to kill by FCAT” (FCATacide). Make up another new word ending in “cide,” and see if your classmates can figure out what it means.</p>

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STUDENT PAGE

NAME _____

DATE _____

Vocabulary Word	What you already know about this word	What new things/ideas you found out about this word
Water quality		
Hazard		
Pollution		
Non-point		
Contamination		
Nutrients		

Video Lesson Plan 4B—*Water Pollution: The Dirty Details*

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