



Explore More: Water Quality

The water we drink, the places we swim, and the plants and animals within our environment are increasingly influenced by one thing—pollution. Agricultural runoff, water treatment processes, lawn maintenance, and other sources significantly impact our communities and the world. The ways we use water, the pollutants found in it, and the issues that challenge its quality must be understood if we are to protect this vital resource. Students viewing *Explore More: Water Quality* will examine issues, survey the experts, and make their own decisions about making a difference in water quality through the choices they make.

This 30-minute video program outlines several issues surrounding the water quality topic, surveys stakeholders and experts in the field, and presents thoughtful questions to challenge your students. The program can be used as a stand-alone piece or used in conjunction with the in-depth Web site and the interactive *Explore More: Water Quality* DVD. Each Explore More program allows your students to investigate important issues in your classroom. The videos are designed to be flexible and are organized around clear segments for pausing for classroom discussion. Watch a five-minute clip to jump-start classroom discussion. Watch the entire program to go in-depth on the issues.

The Explore More feature videos give the big picture, increase awareness, and facilitate discussion with thought-provoking issues and expert interviews. Each 30-minute video introduces compelling issues, surveys stakeholders and experts in the field, and presents thoughtful questions to challenge students. The Viewpoint Extras, following each feature VHS program, are 15-20 short interview segments of in-depth analysis of issues. Companion viewing guides with pre-viewing and post-viewing questions, timecodes for easy accessibility, and key vocabulary words, as well as video scripts help students examine and evaluate perspectives and arguments.

PROGRAM INFORMATION

Companion Web site at www.iptv.org/exploremore

Title: Explore More: Water Quality

Series: Explore More

Producer: Iowa Public Television

Distributor: Iowa Public Television

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Physical Format: VHS

Length: 29:00 minutes (plus additional 15:00 minutes of interview segments)

Audience: 6 grade +

Closed Captioning: Yes

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Video Discussion Questions

Explore More: Water Quality is a 30-minute feature video that outlines several issues surrounding the topic, surveys stakeholders and experts in the field, and presents thoughtful questions to challenge your students. Following the main feature are four additional Viewpoint Extras. The feature video and Viewpoint Extras have a set of pre-viewing and post-viewing questions for classroom discussion.

EXPLORE MORE: WATER QUALITY FEATURE VIDEO

Timecode

Module One: The Water Quality Puzzle

00:00

Uses

Pre-Viewing Questions

What facts do you know about water quality? • What are two ways you use water before you get to school each day?
• Where does your water come from?

Post-Viewing Questions

What ways have you used water that you have taken for granted? • Why is water quality important?

04:50

Practices

Lynette Seigley, Research Geologist, Department of Natural Resources (DNR), Iowa City, IA

Pre-Viewing Questions

Who is upstream from you? Who is downstream from you? • What do you do now that can positively or negatively affect water quality?

Post-Viewing Questions

How would soil erosion impact water quality? • Why would improper disposal of paint affect water quality? • What practices do you see in your area that can negatively affect water quality?

05:40

Pollutants

Lynette Seigley, Research Geologist, Department of Natural Resources (DNR), Iowa City, IA; Robin Pruisner, Nutrient Management Specialist, Department of Natural Resources (DNR), Des Moines, IA; Bill Stowe, Director of Public Works, Des Moines, IA

Pre-Viewing Questions

What comes to mind when you think of water pollution? • Can a stream be perfectly clear and still be polluted? Can a stream look polluted and still be healthy?

Post-Viewing Questions

What pollutants are likely problems in your area? What are the sources of these pollutants? • List examples of the four pollutant types from the video. Which of these do you think would be most difficult to handle? Why?

11:00

Hydrology

Lynette Seigley, Research Geologist, Department of Natural Resources (DNR), Iowa City, IA; Wayne Peterson, Urban Resources Conservationist; Natural Resources Conservation Service (NRCS), Iowa City, IA

Pre-Viewing Questions

How does water physically move in your area? • Does water move naturally in your area or have people affected its movement?

Post-Viewing Questions

What is hydrology? What is the hydrologic cycle? • Examine the hydrologic cycle in your area. How has water quality been affected by the modifications of the area's hydrology? • What characteristics present in your hydrologic cycle could easily be changed to imitate natural hydrology?

14:00

Sources

L.D. McMullen, CEO, Des Moines Water Works, Des Moines, IA

Pre-Viewing Questions

How can pollution get into the water? • If you bury a pollutant in the ground, can it also be considered a water pollutant? How?

Post-Viewing Questions

What is nonpoint source pollution? • What point source pollution is/was in your area? • What nonpoint source pollution is in your area? What is happening in the hydrologic cycle to move pollutants into the water?

15:28

Module Two: Water Quality Problems

The Watershed Approach

Lynette Seigley, Research Geologist, Department of Natural Resources (DNR), Iowa City, IA; Scott Wesselmann, Water Superintendent, Winterset, IA

Pre-Viewing Questions

What is a watershed? • How does the way we use land affect water quality?

Post-Viewing Questions

Identify the watershed in your area. What are the potential pollutants? What are the potential sources of these pollutants? • What measures are/could be taken to solve pollution problems in your area?

18:57

Excess Nutrients

Emily Eide, Director of National Affairs, Iowa Farm Bureau Federation

Pre-Viewing Questions

What fertilizers are used in your area? Why are they used? • Are these uses necessary? Unnecessary? Why?

Post-Viewing Questions

What are the sources of nutrients in your watershed? What responsibilities do the users of these nutrients have to protect water quality? • What rights should users of these nutrients have? Not have? Who should decide these rights?

20:55

Manure Management

Iowa Senator Joe Bolkcom (D), Natural Resources Environment Committee; Fred Kirschenmann, Leopold Center for Sustainable Agriculture, Ames, IA; Allen Burt, Farmer, Marshalltown, IA

Pre-Viewing Questions

What comes to mind when you hear about manure spills or fish kills? • How can politicians influence farming practices? • How can the economic needs of farmers influence farming practices?

Post-Viewing Questions

What are farmers' responsibilities to the land, neighbors, and society when dealing with manure management? • What manure management practices do you see or hear about in your area? • How have the farmers in your area been good stewards of the land? What are some areas for improvement?

25:05

Urban Runoff

Wayne Peterson, Urban Resources Conservationist, Natural Resources Conservation Service (NRCS), Iowa City, IA

Pre-Viewing Questions

Study an urban area near you. What kind of hydrology or water system was present before this urban setting was built? • Examine new buildings in an urban area near you. What differences, if any, are there in the way the land is used in this new development as compared to older, more established development?

Post-Viewing Questions

Describe the hydrology in an urban setting near you. What pollutants do you see entering the waterways? • What "green" development can be done to reduce the harm of these pollutants?

27:00

Take Action

Environmental Club, Davenport, IA

Pre-Viewing Questions

How would you describe the student awareness of water quality issues in your area? • Describe your current uses and practices that contribute, either positively or negatively, to water quality.

Post-Viewing Questions

What water quality measures are being taken in your area? What organizations or groups are involved in these efforts? • What actions can you take to improve water quality? What are your plans to get involved in improving water quality?

EXPLORE MORE: WATER QUALITY VIEWPOINT EXTRAS

Timecode

29:20

At Issue: Regulation – Is government regulation a solution to water quality problems? How?

Robin Pruisner, Nutrient Management Specialist, Department of Natural Resources (DNR), Des Moines, IA; Fred Kirschenmann, Leopold Center for Sustainable Agriculture, Ames, IA; Iowa Senator Joe Bolckom (D), Natural Resources Environment Committee; L.D. McMullen, CEO, Des Moines Water Works, Des Moines, IA; Bill Stowe, Director of Public Works, Des Moines, IA

Pre-Viewing Questions

What is government regulation? • In what ways does government “regulate” aspects of our lives?

Post-Viewing Questions

Protecting water quality is a difficult and sensitive issue. Is this something that can be or should be regulated? If so, should regulation be local? federal? • Are water quality standards enforceable with nonpoint source pollution? How? • What are the problems regulating water quality “best practices”? How can these obstacles be removed or minimized? • How can regulatory agencies support best water quality practices? What needs to happen before compliance becomes widely accepted and practiced? • What are the biggest challenges for regulating nonpoint source pollution?

35:13

At Issue: Agriculture – How does the business of agriculture influence water quality?

Fred Kirschenmann, Leopold Center for Sustainable Agriculture, Ames, IA; Allen Burt, Farmer, Marshalltown, IA; Iowa Senator Joe Bolckom (D), Natural Resources Environment Committee; L.D. McMullen, CEO, Des Moines Water Works, Des Moines, IA; Bill Stowe, Director of Public Works, Des Moines, IA; Scott Wesselmann, Water Superintendent, Winterset, IA

Pre-Viewing Questions

List the ways water is used in agriculture. How is water used differently for various agricultural businesses? • How could poor water quality influence crop production? livestock production?

Post-Viewing Questions

What unique financial problems do farmers face when water quality and crop production are incompatible? What changes need to happen to unravel this agricultural puzzle? • What does L.D. McMullen mean when he speaks of the “opportune time” of applying nutrients? What does this mean for farmers?

41:45

At Issue: Urban Settings – What can urban areas do to improve water quality?

Lynette Seigley, Research Geologist, Department of Natural Resources (DNR), Iowa City, IA; Robin Pruisner, Nutrient Management Specialist, Department of Natural Resources (DNR), Des Moines, IA; Scott Wesselmann, Water Superintendent, Winterset, IA

Pre-Viewing Questions

Think of the ways you use water for your living purposes. Have your uses been wise? unwise? • How does your town use water? Do you see any practices that could waste water or impair its quality?

Post-Viewing Questions

What can suburban and urban residents do to minimize the harm of applying fertilizer to lawns and gardens? How can these residents be convinced of new nutrient application practices? • Other than limiting the use of nutrients, what measures can be taken to improve water quality in your household? neighborhood? school? • What can you do to positively impact water quality in your area?

45:26

At Issue: Emerging Contaminants – How do current health practices affect water quality?

L.D. McMullen, CEO, Des Moines Water Works, Des Moines, IA; Bill Stowe, Director of Public Works, Des Moines, IA

Pre-Viewing Questions

Have you ever taken antibiotics? Other prescription medications? • What could the medicine we take have to do with water quality?

Post-Viewing Questions

How can medicine enter our water supply? • Given the amount of medicine our society uses every day, how can we protect water quality? • How can we change our health practices now to minimize the impairment of our water?

Key Words WATER QUALITY FEATURE VIDEO

cryptosporidium	a single-celled parasite (protozoa) that can infect humans; the disease, cryptosporidiosis, produces severe diarrhea and a low-grade fever
earthen lagoons	pits dug into the ground, often lined with plastic or clay, and used to store manure
ecosystem	all the living and non-living parts of a given area in nature and their relationship to one another
erosion	rock or soil worn away by wind or rain
green development	construction that takes the environment into account throughout the design and building process
hydrology	This is the scientific study of water on earth. It includes not only water on the earth's surface, but also groundwater and water in the atmosphere.
tiling	a drainage system that runs underneath farmland and drains water out of the ground (usually) directly into waterways
pathogen	an organism that directly causes a disease; examples include bacteria and viruses
PCBs	Polychlorinated biphenyls are a group of 209 chemical compounds for which there are no natural sources. They are no longer produced in the U.S. They are toxic to humans and other organisms and do not break down easily.
phosphorous	a nonmetallic element of the nitrogen family; often found as phosphates
point source pollution	a contaminant (ex., chemicals, pesticides, manure) that affects the environment in a negative way and that can be traced back to its source
nitrate	sodium nitrate or potassium nitrate used as a fertilizer
nitrogen	Nitrogen is an element that makes up 78.1% of the earth's atmosphere. Nitrogen is a fertilizer that plants use. Bacteria in the soil are capable of "fixing" the nitrogen into a usable form for plants. Nitrogen is an important part of all proteins.
nonpoint source pollution	a contaminant (ex., chemicals, pesticides, manure) that affects the environment in a negative way and that cannot be traced back to its source
sediment	soil, sand, and minerals washed from the land into water, usually after a rain
watershed	an area of land drained by a water system

Key Words

WATER QUALITY VIEWPOINT EXTRAS

antibiotic	an antibiotic is a type of drug that kills bacterial infections. Overuse of antibiotics can cause resistant strains of bacteria.
bacteria (pl.)	Bacteria are living organisms that can be both beneficial and harmful to humans. Bacteria are used to produce medicines (antibiotics), yogurt, and even help decompose organic matter. Other bacteria can cause diseases like cholera and tuberculosis.
contaminant	A contaminant is a substance that pollutes water. Motor oil, bacteria, manure, industrial waste, road salts, and farm chemicals are all examples of contaminants to water.
co-op	A co-op is a business made up of people with similar goals. Farmers often form co-ops so they can store, sell, and market their products together. This makes it cheaper for the members of the co-op to do business.
DNR	The Department of Natural Resources is a state department that is responsible for the natural resources (lakes, rivers, state parks) of a state.
EPA	The Environmental Protection Agency provides leadership in the nation's environmental science, research, education, and assessment efforts. EPA works closely with other federal agencies, state and local governments, and Indian tribes to develop and enforce regulations under existing environmental laws.
hormonal disrupters	Research is showing the organic pollutants (DDT, PCBs, dioxins) may mimic or inhibit hormones and interfere with natural regulatory processes in mammals and amphibians even in extremely low doses.
incentive	something that prods or guides an action; an incentive to doing chores is an allowance
microbiological	pertaining to the microscopic forms of life
nitrate	sodium nitrate or potassium nitrate used as a fertilizer
nirtogen	Nitrogen is an element that makes up 78.1% of the earth's atmosphere. Nitrogen is a fertilizer that plants use. Bacteria in the soil are capable of "fixing" the nitrogen into a usable form for plants. Nitrogen is an important part of all proteins.
phosphorous	a nonmetallic element of the nitrogen family; often found as phosphates