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Treat Water Well

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An Integrated Curriculum For The Washington Post Newspaper In Education Program

How We Clean Polluted Water

How do we deal with sewer water?
When you flush your toilet, where does its content go?
How about the water that runs off into the street? Where does it go?

To understand the steps needed to treat water so it is safe for you to drink, you need to understand the difference between organic and inorganic solids.

Organic

Organic means it comes from living things. Microbes, small creatures, eat the organic material and what is left is harmless gas and natural waste that can be used on farms as fertilizer.

Inorganic Solids

Inorganic solids are not natural and will not break down with microbes. These solids (such as plastics, glass and metal) are separated and then taken to landfills.

You are ready to follow the steps taken to treat unclean water. Using the six steps below, find out how we deal with the pollution in our water. Use these guide questions to help you better understand the process.

- Where does water that goes down the drain go?
- What is Blue Plains?
- How does the facility get rid of plastic materials?
- What is a landfill?
- What are organic materials? How are microbes used in the process?
- Why are chemicals added to the water?

Water Treatment Process

1. Polluted water washes into the sewer system and is eventually collected at the Blue Plains Waste Water Treatment Center.

2. Large tanks gather the waste and gravity pulls the waste to the bottom of the tank. Filters separate the organic materials from the inorganic materials.

3. Inorganic waste is separated and removed from the sludge. It is carried away and buried in a landfill.

4. Organic material is collected in a sludge which is broken down by microbes that have been added to the sludge. The microbes release gas and their solid waste is taken to farms for fertilizer.

5. The water that is left has to be purified. First, a form of bleach called sodium hypochlorite is added to the water to disinfect it. Then sodium bisulfite is added to get rid of the bleach. The water is clean.

6. The treated water is released back into the Potomac River as part of the water cycle or stored for use.

When you are finished, draw a diagram showing the steps of how water and pollution are dealt with in the city.

Name _____ Date _____

Steps in the Process

After exploring the different aspects of the Blue Plains Waste Water Treatment Center, number each step.
Cut out each pipe (step). Place the pipes in the correct order. Label and paste them on a piece of paper.

STEP NO.

Organic material is collected in a sludge which is broken down by microbes. Solid waste is taken to farms for fertilizer.

STEP NO.

The purified water is then released back into the Potomac River or stored for use.

STEP NO.

Inorganic waste is separated and removed from the sludge. It is carried away and buried in a landfill.

STEP NO.

Large tanks gather the waste. Filters separate the organic materials from the inorganic materials.

STEP NO.

Water is treated with a form of bleach to sanitize it. A form of salt is added to offset the bleach.

STEP NO.

Polluted water washes into the sewer system and is eventually collected for treatment.

Name _____ Date_____

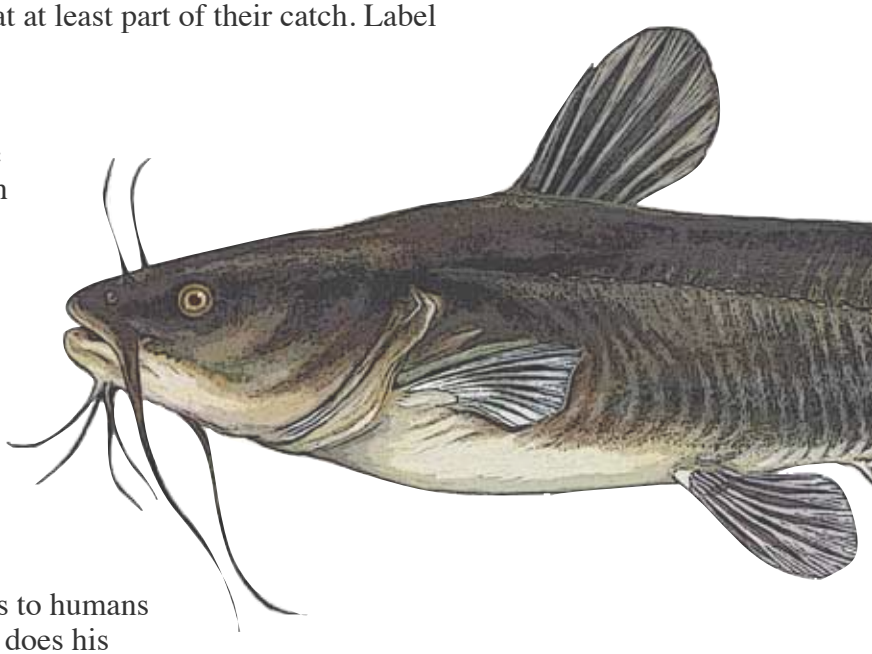
Warning: Catch and Release

On a pleasant day one can find anglers with their poles draping over the Anacostia River. Some are there for the pleasure of catching, then releasing the catfish and carp back into the stream. Others are seeking that evening's dinner for their families. Is there anything dangerous in this scene?

After reading "On Anacostia, some don't catch tainted-fish warning," answer the following questions.

1. *Post* writer Darryl Fears reports on a recent study. Who conducted the study? What is the title of the study?

2. How large is the group of anglers who were interviewed? Create a bar graph to illustrate the number of fishermen who say they often catch catfish. Draw a second graph to present the percentage of anglers who eat at least part of their catch. Label both graphs.



3. Fears provides a profile of the anglers who were interviewed. Create graphics to present the ethnic background, educational level and frequency with which they fished the Anacostia.

4. Name five sources of pollution of the Anacostia River.

5. Why does the D.C. Health Department warn against swimming in the Anacostia?

6. How do catfish, carp and eels become tainted in the Anacostia River?

7. What harm does biologist Fred Pinkney say exists to humans who eat fish caught in the Anacostia River? How does his quotation balance what Dottie Yunger states?

8. What are reasons that anglers do not heed the posted warnings?

9. Draw a poster that communicates a main idea presented in Fears' article.

10. If you could talk to one of the fishermen, what would you say to him?

Name _____ Date_____

A Riverkeeper Who Is a Guiding Light

Read "Potomac losing a guiding light: Riverkeeper retires after a decade of fighting pollution."

1. How many gallons of water are taken from the Potomac River basin daily for human use? Approximately how many people are depending on the water to be clean?

2. "Potomac losing a guiding light" is a profile of Ed Merrifield, a Potomac riverkeeper. What is the job of a riverkeeper?

3. Waterkeeper Alliance is an international organization.
   a. Who began the Waterkeeper Alliance in 1996?
   b. Who inspired these individuals to begin a concerted effort in New York?

4. The Patuxent riverkeeper said, "The work by its nature is adversarial." Why do people and groups get angry at riverkeepers?

5. Explain how the Public Trust Doctrine and the Clean Air Act impact the work of riverkeepers.

6. Why was Ed Merrifield a good choice to be a riverkeeper?

KATHERINE FREY/THE WASHINGTON POST

Potomac riverkeeper Ed Merrifield, reflected in a boat's windshield, surveys the river by the Memorial Bridge near Georgetown.

7. Were you surprised to learn that as the Potomac's riverkeeper Ed Merrifield had to raise money, and supervise a staff that he formed? What does this tell you about the Waterkeeper Alliance and individuals who are involved in its efforts?

8. Review Paul Gallay's list of requirements to be a riverkeeper. Which of these do you think is most important?

9. What are "weasel words," according to Mike Bollinder, the Anacostia riverkeeper?

10. Considering the example of Ed Merrifield, the quotations of knowledgeable individuals, and documents, do you have what it takes to be a riverkeeper? Support your answer with reasons.

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Think Like a Reporter

Write a Follow-up

Reporters cover many stories each month. Readers get the information they need to be informed, to be aware of happenings in their community and to make decisions. Some stories leave readers wanting to know more: Did the mayor act on the council's recommendations? What happened to the lottery winners or survivors of a fire? Was the water polluter fined? To answer the questions, reporters write follow-up stories.

POLITICS & T

Transocean agrees to pay $1.4 billion fine

Owner of drilling rig that exploded in gulf settles with Justice Dept.

BY BRAD PLUMER

The owner of the drilling rig that exploded and led to the massive 2010 oil spill in the Gulf of Mexico will pay $1.4 billion in criminal and civil penalties, the Justice Department said Thursday.

Transocean Ltd. agreed to accept some responsibility for its role in the gulf disaster which took place after its Deepwater Horizon rig caught fire, killing 11 people. The company will pay $1 billion to resolve civil claims and $400 million in criminal penalties, and will plead guilty to one misdemeanor violation of the Clean Water Act.

Yet Transocean's punishment was considerably smal

1. The headline and first paragraphs of a news story summarize the main news. They provide most, if not all, of the 5 Ws and H — Who, What, Where, When, Why and How. Fill in the information for the Transocean story.
   a. Who:

   b. What:

   c. Why:

2. Providing the source of information is called giving attribution. Underline the source of this news.

3. The settlement is for criminal and civil penalities. How are these divided in the Transocean Ltd. settlement?

e-Replica

4. Read the entire article. It is found at *http://thewashingtonpostnie.newspaperdirect.com/epaper/showlink.aspx?bookmarkid=23MYUKYK4AP8*. This is an example of a follow-up story. Many lives were affected by the 2010 oil spill in the Gulf of Mexico. Environmentalists, business owners, and concerned citizens are among the many who have questions: Were any individuals held responsible? What is water quality like now? Are the fish safe to eat? What are three questions you would ask regarding the aftermath of the oil spill?

a.

b.

c.

5. Reporters provide accurate information from which readers draw their own conclusions.
   a. Compare and contrast the criminal and civil penalties against BP and Transocean, Ltd.
   b. What do you conclude about the level of responsibility for the oil spill?

6. Documents and public statements are important sources of information.
   a. List three of these types of sources used by Brad Plumer.

   b. What do you conclude from these sources?

7. Is all legal action completed against Transocean and BP? Be specific in your answer.

8. Even if the initial news story was very prominent and extensively covered, a follow-up story should contain background information.
   a. In which paragraphs does writer Brad Plumer provide a reminder or summary of the events that began on April 20, 2010?

   b. Does Plumer provide enough information to explain why these companies have faced civil and criminal action?

9. The main focus of the news article has been on the Transocean Ltd. settlement with the Justice Department and the related BP settlement. In paragraph 15, a third company is mentioned. Why is Halliburton part of the story?

10. News reporters put information in descending order of importance. Read the last paragraph of the Transocean story.
   a. If you applied the cut-off test, would the news story change?

   b. In what way is stock market reaction related to the main news?

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More Than Letters

BMP Best Management Practice

CAFO Major pollution sources that discharge nitrogen, phosphorus and fecal bacteria into waterways. The CAFOs (concentrated animal feeding operations) can make waterways unsafe for swimming and trigger algae blooms.

CWA Began as the 1948 Federal Water Pollution Control Act; since 1972 known as the Clean Water Act. EPA implements pollution control programs and sets water quality standards.

EPA Environmental Protection Agency

NACWA National Association of Clean Water Agencies, founded in 1970, water quality protection in legislative and regulatory arenas

NPS Nonpoint Source

SDWA The Safe Drinking Water Act 1974 (amended 1996) ensures the quality of Americans' drinking water and its sources

TMDL Total Maximum Daily Load, a "pollution diet," sets pollution limits necessary to meet applicable water quality standards in the Bay and its tidal rivers

U.S. FISH & WILDLIFE SERVICE/EPA

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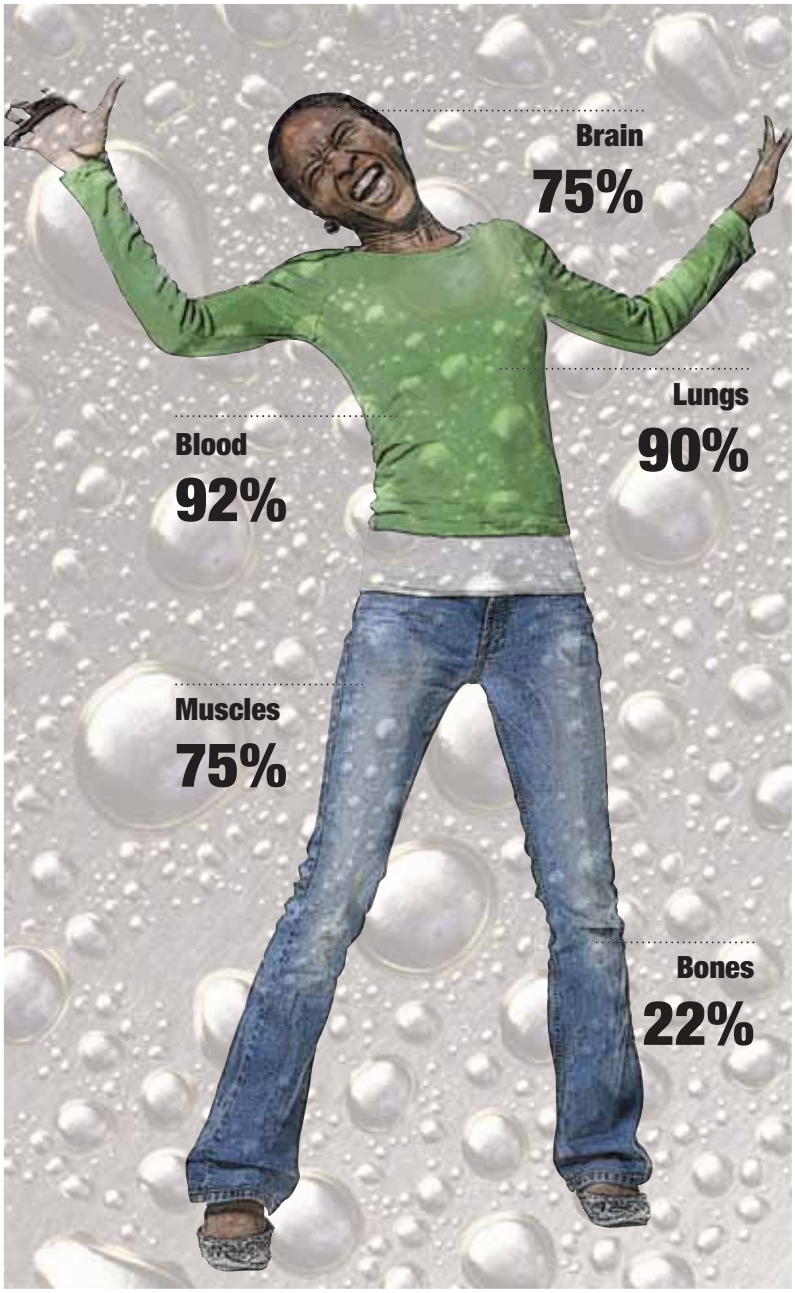
Water Within the Human Body

Babies are approximately 75% water. As you get older that percentage decreases to around 60%. The actual water content in the organs will vary between people. For example, women have a lower percentage of water making up their body.

Most sources agree on these approximate percentages of water composing the organs and body parts.



IMAGES PHOTODISK AND RUBBERBALL

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Drink Water. Lose Weight. Keep Healthy.

Water helps to maintain muscle tone. It reduces sodium buildup. Water helps your body eliminate waste and flush toxins out of vital organs. Water in your cells assists in the biological processes, dissolving essential nutrients, minerals and chemicals.

When you breathe, perspire and urinate daily, you lose water. When you exercise, you lose water in your sweat. You don't want to dehydrate because water is so important to staying healthy.

To keep up your energy, eat the right foods and drink water.

Remember: Fruits and vegetables contain water. Watermelon and tomatoes are 90 percent water. Orange juice and milk contain water and vitamins. Water is calorie-free. So fill 'er up and enjoy that clear, clean glass of water.

Conduct Great Thoughts

Chemists will tell you that water is a great conductor of electricity. This keeps your body functioning. Think of the brain neurons. They exchange information through electrochemical transmitters. When you have an idea, it's an electric experience.