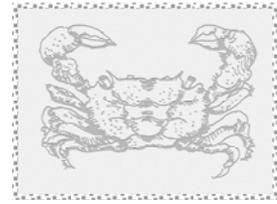


FIELD LESSONS



BUILDING A WATERSHED

Overview

Students will learn components of a watershed through an interactive activity.

Materials

- Watershed Poster
- Watershed Story (one copy per instructor, pages 50 - 51)
- Watershed Story game pieces
- Watershed Discussion Topics (pages 52 – 53)
- Explorer Journal

Procedure

1. Provide each explorer with a game piece that is a part of your watershed.

2. **Ask each student** to place their item in the watershed model when they hear the bolded words on their piece.

3. Tell students that at the bottom of their item there are instructions that tell them where to place the item in the watershed poster.

4. At the end of the story, each student will be asked to answer the following questions on page 8:

- What item will you be putting in the watershed?
- Is your item a natural part of the watershed? Explain.
- What role does your item have in the watershed? Explain.

5. With the class read the *Watershed Story* provided *I am a drop of water...*

6. Go over discussion topics with students to check for comprehension and to help students answer their questions. If time allows, you can lengthen your discussion after students have answered their questions.

7. Ask students to complete the *Building a Watershed Field Trip* page in their journals on page 8.



ACTIVITY: Building a Watershed

Date: _____

INSTRUCTIONS: Each explorer in your group will be given an item that is a part of your watershed. With the group, listen to the story being read. Your leader will ask you to place the item in the watershed model when you hear about it in the story. (On the back of your item there are instructions that tell you where to place the item in the watershed.)

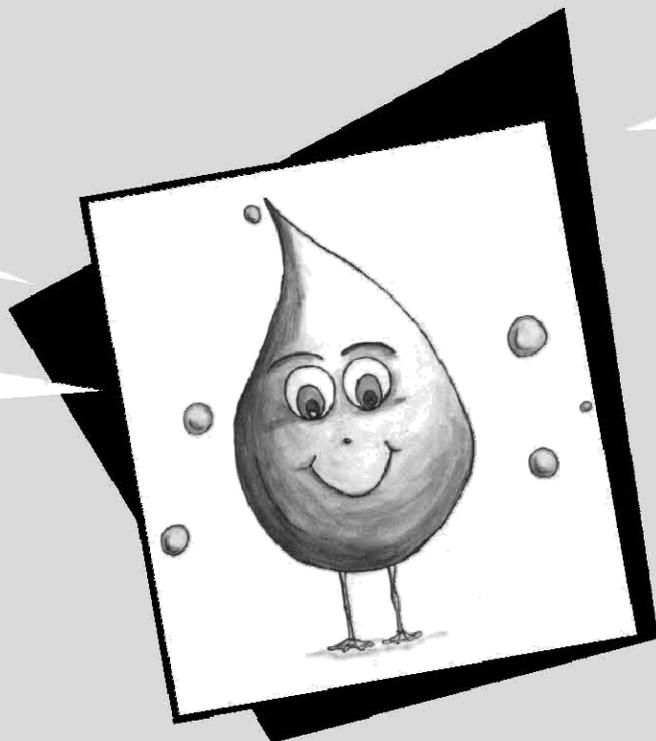
What item did you put into the watershed?

Is your item a natural part of the watershed?

What role does your item have in the watershed? Explain.

8

WATERSHED STORY



I am a drop of water...

A watershed is my home. It starts at the mountains where the snow melts, becoming water, and enters a river or stream. The river or stream, sometimes called a waterway, flows downhill. Often a few streams or rivers will join at points along the watershed creating one waterway. The water continues to flow through different habitats and towns, finding its way to the coast and ocean. Along the way, water may be added from rain or run-off the land. The watershed starts as freshwater at the top of the mountains and eventually mixes with the saltwater of the ocean when it reaches the coast.

I am a drop of water that has been here since the beginning of time. Millions of other drops of water, mountains, rivers, creeks and the ocean that form my watershed keep me company.

I have watched this landscape change. Once there were roaming dinosaurs and dense forest for miles. Today there are over 4 million people living in and around my home – the Tijuana River watershed.

As I travel the creeks of southeastern San Diego County, Tecate, and Tijuana I see many different habitats that are home to a diversity of animals and plants. Year after year, I make my way to the ocean through forests, alongside the chaparral and coastal sage scrub, through the riparian corridors and wetlands, and back again to the ocean.

The plants of these habitats are critical to my survival. They help hold the soil in place along the watershed. The plants help to filter out pollutants that have become a big problem for all of us in the watershed. Without the plants, the rivers I travel in would fill up with soil and pollutants.

Along the way I have watched animals come and go. Many decades ago, I remember a large bird with enormous wings and a bald red head that would soar along my watershed. I have heard humans call it a condor. Its shadow once was seen casting down over the rivers and streams as it soared along the wind currents. I have not seen these birds for quite some time.

As I fall from the sky with the other droplets of rain, hail, or snow, I can see below the many changes made by humans to the watershed and the land. Unfortunately, humans do not always see how the changes they make will affect the future of the watershed and their freshwater. Only 2.8% of the water on this earth is freshwater that is recycled over and over through many watersheds. The natural soils, rocks, sands, and plants have worked together over time to purify water by filtering out the minerals and salts as the water passes through the watershed. When humans change or remove these natural filters, the little freshwater we have becomes threatened along with all the things that depend on it to survive.

During the last century, I have watched people damage and pollute the watershed, often not knowing it!

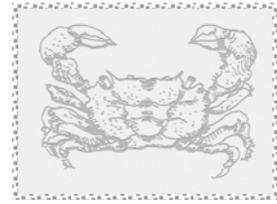
All the storm drains on the streets empty into my home. Leftover paint, engine oil, and chemicals washed into the storm drains lead into the watershed, polluting the water, harming and killing animals, and making it unsafe to swim. Many times a year, beaches in San Diego are closed down because of polluted water that comes from our watersheds.

I have also seen humans develop new areas along the watershed, forgetting the importance of the natural filters and plants that keep the soil from eroding and keep our water free of salts and minerals. When areas are built in this way, it becomes harder and harder for me to stay clean and pure, as freshwater should be.

I am a little drop of water that with your help can continue to be an important part of your watershed.

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FIELD LESSONS



BUILDING A WATERSHED

Discussion Topics

1. Where does the watershed begin?

- Answer: It starts as fresh water at the top of the mountains.

2. How and where does water flow through a watershed?

- Answer: HOW? It starts at the mountains where snow melts, becoming water, enters a river or stream that makes its way all the way to the ocean as it flows downhill with gravity.
- Answer: WHERE? It starts in the mountains and flows downhill through forests, alongside the chaparral and coastal sage scrub, through the riparian corridors and wetlands and back again to the ocean.

3. Why has the drop of water been around since the beginning of time?

- Answer: water cycle discussion (evaporation, condensation, precipitation)

4. What are some of the habitats found within the Tijuana River Watershed?

- Answer: forests, chaparral, coastal sage scrub, riparian, wetlands, ocean, dunes
What is a habitat? (See vocabulary list on pages 26 - 27)

5. Why are plants important for the watershed?

- Answer: They help hold the soil in place
- Answer: They help to filter out pollutants

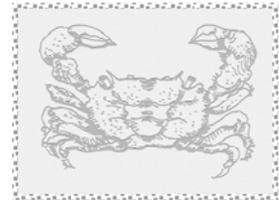
6. Who remembers the item that we took out of the watershed?

- Answer: The condor

Why did we take out the condor?

- Answer: To symbolize it is an endangered species. In the story it says, "Its shadow once was seen casting down over the rivers and streams as it soared along the wind currents. I have not seen these birds for quite some time."
- Answer: In 1983, there were only 25 remaining California Condors in the wild. In 1987, the remaining 8 condors were captured and taken to the San Diego Zoo (Wild Animal Park) and the Los Angeles Zoo where they are being captive bred.
- Answer: In 1992, the first captive-bred condors were reintroduced into the wild. As of May 1, 2002, the total population of condors reached 197, and the free-flying population reached 68. For population number updates, see the California Condor Recovery Program website:
http://www.sandiegozooglobal.org/success_stories/condors
<http://cacondorconservation.org>
- Answer: Reasons why condors are endangered – loss of habitat, poaching, and lead poisoning. California condors, who scavenge for carcasses left behind by hunters, unintentionally eat lead fragments from bullets. These fragments can lead to serious illness or even death for the condor. Lead works by attacking the nervous system. Some early effects of lead poisoning in condors are loss of balance and inability to fly. Later effects are generally a result of damage to nerves that control the digestive system. Loss of appetite and associated weight loss can occur rapidly. If not treated quickly, the damage to the nervous system is irreversible and leads to a slow and agonizing death.
- Answer: What are some other threatened and endangered species at the Reserve? (See page 76 for a list of endangered and threatened birds at the Reserve)

FIELD LESSONS



BUILDING A WATERSHED

Discussion Topics continued

7. How much of the water on earth is fresh water?

- Answer: 2.8%

8. What are some ways that people damage the watershed?

- Answer: Leftover paint, engine oil, chemicals, etc wash into the storm drains that lead into the watershed.
- Answer: Building and development removes plants and trees, which lead to erosion and dirty freshwater (plants help to filter out pollutants and help keep soil in place). Erosion happens when there are no plants to hold the soil, then when it rains the soil washes away and into the watershed, the soil or sediment can fill in wetlands and dirty our limited supply of freshwater.

9. How can you help the watershed stay clean?

- Answer: Have students brainstorm ideas such as:
 - * Dispose of your trash properly. Recycle!
 - * Keep motor oil, animal waste, fertilizers, pesticides, and even yard clippings out of the gutter.
 - * Choose products that are earth-friendly and can be recycled.
 - * Make good decisions about how you get from one place to another. Ride a bike or walk when you can.
 - * Teach these smart habits to your friends and family.

10. How is a watershed like a large community?

- Answer: It is geographical region, so instead of a map being divided up into counties or states, it could easily be divided into watersheds.
- Answer: We all live in a watershed.
- Answer: What someone does upstream in the watershed affects everything and everyone that lives downstream.

