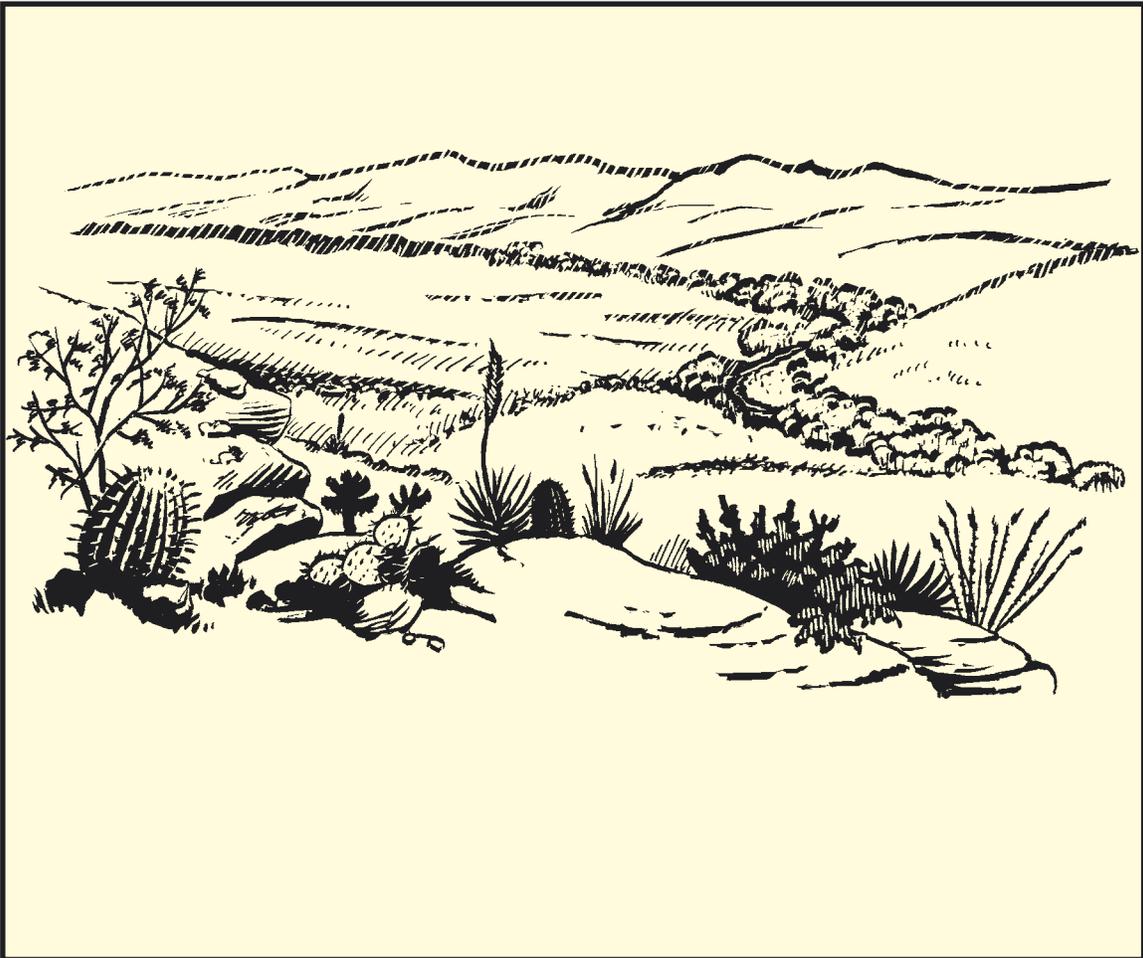


LESSON 4

RIVER ISSUES



Students will learn about specific issues relating to the Santa Cruz River, assert their opinion about each, and participate in a debate using knowledge gained.

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LESSON OVERVIEW

Students will learn about specific issues relating to the Santa Cruz River, assert their opinion about each, and participate in a debate using knowledge gained.

Subjects

Reading, Science, Social Studies

Standards

Science in Personal and Social Perspectives, Life Science, Earth Science

Objectives

Students will:

1. Read about issues currently affecting the Santa Cruz River.
2. Summarize and present the contents of a reading assignment.
3. Discuss and evaluate current issues.
4. Present and defend their position on a current issue.

Preparation

Make copies: 1) **Master Pages 4.3 - 4.4**, either one per two students, or cut them out to make cards, 2) **Master Page 4.5**, one for each student, 3) five of **Master Page 4.6**

Time

One to two 50 minute sessions.

Vocabulary

ATV, interpretation, littering, pollution, riparian

RIVER ISSUES

Part 1 - The Issues

1. Review the information on **Master Pages 4.3 - 4.6** as teacher background before proceeding with the lesson.
2. Review and discuss each of the following four issues affecting the river: As much as possible, try to present each issue without biasing or influencing the students.

Water

ATVs

Littering

Pollution

3. Divide students into groups of two or three and hand out a copy of the Jigsaw readings on **Master Pages 4.3 - 4.4** (see preparation) to each group. Consider reading abilities when selecting groups.
4. Assign a reading to each group and explain that they will need to summarize the content and present it to the rest of the class.
5. Have each reading group present their summary to the class.

Part 2 -

What Do You Think

1. Hand out a copy of **What Do You Think?** on **Master Page 4.5** to each student and ask students to complete the worksheet, based on what they learned from the reading.
2. Upon completion of the worksheet, discuss each of the four issues allowing students to interject their personal opinions. Use the following questions as guidelines:

WATER

What will happen if the Santa Cruz River Valley gets as big as Tucson?
Is there enough water for housing, recreation, agriculture, and the river?

ATVs

Should ATVs (All Terrain Vehicles) be allowed along the Santa Cruz River? If not, is there somewhere else they could go?

LESSON 4 - RIVER ISSUES

LITTERING

Is trash bad or dangerous? Why? How can trash be controlled?

POLLUTION

In what ways does pollution affect us individually or as a community?

Part 3 - Preparing for the Debate

1. Introduce the groups listed below and discuss how each group might want to use the Santa Cruz River:

Off-road vehicle users

Developers

Picnickers

Hikers

Birders

2. Divide the class into five working groups. Assign each group to represent one of the user groups on **Master Page 4.6**. Give students a copy.

3. Explain that each student is to pretend that they are members of their assigned club or special interest group. The goal of the meeting is to prepare for a public hearing about the future of the Santa Cruz River.

4. In their own group, ask students to write answers to the following questions:

What kind of people are in the group? Do they share any common interests? Does the culture of the members have anything to do with the group? How do they use the river? How often do they go there? Do they help the river or its environment in any way? Do they hurt it?

5. Have students prepare for the upcoming debate by creating a small presentation (a speech or an advertisement) to convince others that your group's activities at the river are important. Speak out for the cause!

6. Discuss the following with the class:

What are the other groups' views about the river? How do they use the river? From your group's point of view, are they helping or hurting? Is your group on good terms with them? Will they support you in a debate? How can you work together so that everyone is happy?

Part 4 - The Debate

1. Once each group is ready, call the whole class together for a public hearing. Have each group present their position to the other groups. Allow some time for questions after each presentation. Upon completion of all group presentations, open the floor to debate.

Enrichments

- Plan a field trip to the Santa Cruz River, the Nogales Wash, or Nogales Wastewater Treatment Plant.
- Bring in a representative from the Friends of the Santa Cruz River, Anza Trail Coalition or other group associated with the river to speak with your class.

LESSON 4 - RIVER ISSUES

<p>1) Water is the most important thing in the Santa Cruz River Valley. Without it, animals couldn't survive, plants wouldn't grow and people couldn't live here. There were few people and plenty of water, before today.</p>	<p>2) In the 1880s things changed during a drought (a time of little rain). Also came big cattle drives, larger farms and the railroad (that allowed ranchers to transport the cows to other parts of the country). All this affected the water.</p>	<p>3) The invention of a new water pump in the 1940s allowed farmers to easily take the water out of the aquifer (a lake under the ground) in different areas along the river. The biggest aquifer is under Tucson with smaller ones between Green Valley and Mexico.</p>
<p>4) In Tucson, more and more people came, built houses and the water supply dropped. To control flooding, river banks were cemented or changed. The water that normally goes back into the water table was moved out of the area.</p>	<p>5) By 1970 the river was pretty much dry on the surface and we were using up more water than was returning into the ground. Then in 1972, many large farms left and they opened the International Wastewater Treatment Plant in Rio Rico.</p>	<p>6) Today, thanks to the recycled water from the treatment plant and better management, the water is put back in the river and it flows year-round between Rio Rico and Amado. Both animals and people use and enjoy the flowing river.</p>
<p>7) But what happens as more and more people move to the Santa Cruz River Valley? Large developments in Rio Rico and Green Valley Nogales are adding new houses every day. Stores and warehouses are built to support goods from Mexico.</p>	<p>8) What will happen if the area becomes as populated as Tucson? Is there enough water? How can we ensure that there will be?</p>	<p>9) One of the main problems along the river is trash. Picnickers, hikers and other people drop litter. Tons of litter is left when trash from Nogales is carried downstream and deposited along the river after a heavy rain.</p>

<p>10) Trash that ends up in the river includes trash from Ambos Nogales (both sides of the border). An estimated 300,000 people live in Nogales, Sonora! Can we work together to educate people in both Mexico and the United States?</p>	<p>11) Pollution is a problem that involves all of the other issues (water, littering and ATVs). The most serious thing is health. Do you know that Nogales, Arizona, has one of the highest rates of lupus disease in the country?</p>	<p>12) Experts believe that groundwater or air pollution are the causes of lupus and other health problems. Poor management in Nogales, Mexico allows factories to dump their waste and toxic chemical spills which cause many problems.</p>
<p>13) With 25,000 people in Nogales, Arizona, and an estimated 300,000 people in Nogales, Mexico, more air pollution is made from uncontrolled automobile and factory exhaust, smoke from fireplaces, and dust from unpaved roads.</p>	<p>14) Disposable diapers, chemical cleaners, soap, batteries and other household, factory and medical products are thrown in the Nogales Wash daily, from both sides of the border, and end up downstream. The chemicals also leak into the ground.</p>	<p>15) ATVs (All Terrain Vehicles) - include motorcycles, three-wheelers, dune buggies, etc. Many people love to drive them along and through the river. It's a lot of fun to race an ATV through the river with water splashing everywhere.</p>
<p>16) Not everyone likes ATVs though. Hikers and bird watchers are upset by the loud noise. ATV tracks make parts of the river look like a highway. Animals, fish and birds are disturbed by ATVs, which can destroy their homes and habitat.</p>	<p>17) As much fun as they are, ATVs can hurt the natural environment. Along the river private property owners have been unable to control ATVs. "No Trespassing" signs and fences are often torn down.</p>	<p>18) What do you think about ATVs? Is there a place for them along the river? Are there other areas that could be used for ATVs? Is there a way to control or limit their use?</p>

WHAT DO YOU THINK?

What do you think about the following issues that affect the Santa Cruz River? Study each of the issues below. In the blank space write down your opinions. Is it a good thing? Should it be managed? How?

ISSUES	WHAT DO YOU THINK?
<p>WATER</p> <p>Water is the most important resource in the Santa Cruz River Valley. Without it, animals couldn't survive, plants wouldn't grow and people couldn't live. People must manage the water very carefully. Do you think that there is enough water in the Santa Cruz River Valley? Would there be enough if the area had as many people as Tucson?</p>	
<p>ALL TERRAIN VEHICLES (ATVS)</p> <p>ATVs are a lot of fun to race through the water, water splashing everywhere, but they hurt the natural environment. Animals and birds are disturbed. Often their homes and habitat are destroyed. As much fun as they are, should they be allowed in and along the river? If not, where should they go? Should they be controlled? How?</p>	
<p>POLLUTION</p> <p>All living things require clean water and air. But what happens when people's septic tanks leak into the water? Factories and individual people sometimes dump harmful chemicals into the ground and the river and pollute the air. Is this right? Can the pollution be controlled?</p>	
<p>LITTERING</p> <p>One of the main problems along the river is trash. Picnickers, hikers and other people drop litter. Even more litter is left when trash from Nogales is carried downstream and deposited along the river after a heavy rain. An estimated 300,000 people inhabit Nogales, Sonora alone! Is trash bad or dangerous? Why? What can you do to help control litter?</p>	

SPECIAL INTEREST GROUPS USING THE RIVER

OFF ROAD VEHICLE USERS	DEVELOPERS	PICNICKERS	HIKERS	BIRDERS
<p>Use motorcycles and ATVs with unrestricted use. All other users are welcome.</p> <p><u>Problem</u> <i>Destroys habitat and natural beauty; causes noise and air pollution; disturbs others trying to enjoy the solitude of the river.</i></p>	<p>Primary goal is to make a housing development. Areas of the river will be preserved as part of the scheme. Others are welcome if they respect homeowners rights and rules.</p> <p><u>Problem</u> <i>Destroys habitat and natural beauty; access for others could become limited; may affect the water supply and its course.</i></p>	<p>Local families like to enjoy the river. Kids enjoy wading and playing while adults like to picnic or party. All others are welcome at the river.</p> <p><u>Problem</u> <i>Litter; possible water pollution; possible health and safety hazards.</i></p>	<p>The Anza Trail allows hikers to walk between Tubac and Tumacácori. They enjoy the trail while learning about the natural area. Everyone who respects the natural area is welcome.</p> <p><u>Problem</u> <i>Any group or activity that damages or disturbs the habitat and its natural beauty is not welcome.</i></p>	<p>The river provides some of the best bird-watching in Arizona. Because they need it quiet, a birder prefers the area to have limited or no access for other user groups except for quiet observers and researchers.</p> <p><u>Problem</u> <i>Because birders prefer a quiet environment, other “noisier” activities might be in conflict.</i></p>