

What's in Your Water?

Ganges River Pollution

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Published by *K20 Center*

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Grade Level	6th – 7th Grade	**Time Frame**	60 minutes
Subject	Social Studies	**Duration**	1-2 class period(s)
Course	World Geography		

Essential Question

Does clean water impact more than just our personal use?

Summary

In this lesson on the importance of clean water as a natural resource, students will begin by observing a polluted water source within a United States community. Next, students will explore the significance of the Ganges River and the political and religious issues that impact the ongoing struggle to maintain this important water resource for the people of India. Then, students will watch a video interview to learn how clean water issues relate to state and local communities before extending their learning with a writing activity to connect the importance of clean water to their personal lives. This lesson includes optional modifications for distance learning. Resources for use in Google Classroom are included.

Snapshot

Engage

Students examine a picture of pollution trash surrounding Lake Arcadia in Oklahoma.

Explore

Using the It's OPTIC-al and Gallery Walk strategies, students analyze several photos of pollution in and around the Ganges River in India.

Explain

Students determine how the Ganges River is used in India and what types of pollution affect the use of the river.

Extend

Students write a Two-Minute Paper about their own contributions to water pollution, then watch an interview with the president of the Oklahoma Water Resources Board (OWRB).

Evaluate

Students formulate ideas about how they can support water conservation and clean-up efforts.

Standards

ACT College and Career Readiness Standards - Reading (6-12)

CLR301: Locate simple details at the sentence and paragraph level in somewhat challenging passages
CLR302: Draw simple logical conclusions in somewhat challenging passages
CLR401: Locate important details in somewhat challenging passages

ACT College and Career Readiness Standards - Writing (6-12)

I&A 201: Understanding the task and writing with purpose. A score in this range indicates that the writer is able to: -Generate a thesis that is unclear or not entirely related to the given issue -Respond weakly to other perspectives on the issue
D&S 301: Building and strengthening the argument. A score in this range indicates that the writer is able to: -Make use of mostly relevant reasoning and examples to support the thesis and arrive at a general or simplistic understanding of the issue -Offer a rationale that largely clarifies the argument -Provide elaboration of ideas and analysis that is somewhat repetitive or imprecise

Oklahoma Academic Standards (Social Studies Practices (7th Grade))

6.4.6: Describe the role of citizens as responsible stewards of natural resources and the environment.

Oklahoma Academic Standards (Social Studies Practices (7th Grade))

7.4.4: Evaluate the effects of human modification of and adaptation to the natural environment through transformation caused by agriculture, the use of modern irrigation methods, industry, demand for energy, and urbanization.
7.4.6: Describe the role of citizens as responsible stewards of natural resources and the environment.

Attachments

- Ganges River Facts Reading—What's in Your Water - Spanish.docx
- Ganges River Facts Reading—What's in Your Water - Spanish.pdf
- Ganges River Facts Reading—What's in Your Water.docx
- Ganges River Facts Reading—What's in Your Water.pdf
- Ganges River Images—What's in Your Water.docx
- Ganges River Images—What's in Your Water.pdf
- It's Optical Graphic Organizer—What's in Your Water - Spanish.docx
- It's Optical Graphic Organizer—What's in Your Water - Spanish.pdf
- It's Optical Graphic Organizer—What's in Your Water.docx
- It's Optical Graphic Organizer—What's in Your Water.pdf
- Lesson Slides—What's In Your Water.pptx

Materials

- Lesson Slides (attached)
- It's Optical Graphic Organizer (attached, one per student)
- Ganges River Facts Reading (attached, one per student)
- Ganges River Images (attached, one set printed in color)
- Highlighters (one per student)
- Chart tablet or poster paper (six, one per image)
- Notebook paper (one per student)

Engage

Teacher's Note: Photo Preparation

This lesson uses a variety of photos to illustrate the different ways in which the Ganges River is polluted. Before beginning the lesson, print the first six pages of the **Ganges River Images** handout.

Print these pictures in color and as large as possible. Place the six prepared pictures of pollution of the Ganges River around the room with a large piece of poster paper next to each picture. Number the posters one through six. Spell out “OPTIC” vertically down the side of the posters.

Use the attached **Lesson Slides** to guide the lesson. Display **slide 2** and introduce the lesson, then continue to **slide 3** and read the essential question for the lesson. Tell students they should think about this question as they look at pictures and gather information about specific water sources. On **slide 4**, discuss the learning objectives the lesson will cover. Display **slide 5** and show the picture of pollution and trash in and near a lake. Ask students to observe all the details of this picture and draw a conclusion about what is going on.

Teacher's Note: Discussion Notes

Have students pay attention to the color of the water, the different pieces of trash they are seeing, other debris, etc. To encourage students to observe the picture details, facilitating questions might include: "*What debris on the shore is man-made? What is natural to the environment? How might all this debris affect the water or water quality? What can you infer about the water or water quality from the picture?*"

Invite students to share their thoughts with an Elbow Partner for 1–2 minutes, and then ask partners to share what they are seeing with the whole class. Ask students to determine the photo's location. Share with the students that the picture is of Lake Arcadia, just north of Oklahoma City, Oklahoma. Then, ask students to think for about 30 seconds about the importance of clean water and how it might impact them. Have them share their thoughts with their partner, allowing 1–2 minutes, and then ask for volunteers to share ideas with the class.

Give students about 6–8 minutes for the entire activity.

Teacher's Note: Lake Arcadia Discussion

For students who don't know where Lake Arcadia is located, explain that it is a lake north of Oklahoma City, near Edmond. This lake has many functions. It is used for flood control in the Deep Fork river basin, provides habitat to fish and wildlife, is used for recreation by the community, and supplies water to the city of Edmond. The point of this lesson is for students to understand the importance of water resources and how water pollution has far-reaching consequences. This lesson will use the Ganges River, a vital water resource in India, to demonstrate the impact of water resources on people. Guide student conversation toward understanding that water quality does not only impacts us personally, but also affects the environment, economy, and daily life.

Optional Modification for Distance Learning

You can substitute the activities in this lesson with a website such as VoiceThread. With VoiceThread, you can upload pictures to the site beforehand. Then, students can choose whether they would like to make a quick video, a voice memo, or a written note to give feedback. For brainstorming and share outs use the web app Padlet. Here students can collaborate with others by posting notes to a digital bulletin board. Download all attachments to use this lesson in Google Classroom or your LMS.

Explore

Introduce students to the focus of the lesson: the Ganges River. Ask students to recall the essential question as they look at pictures and gather information about water pollution and its impact. Number students one through six, or assign them into six working groups. Pass out a copy of the attached **It's Optical Graphic Organizer** to each student. Introduce the It's OPTIC-AL strategy on **slide 6.** Display **slide 7**, have each group report to their corresponding numbered poster. Ask groups to observe the assigned picture in detail as they did previously and fill out the chart paper next to the picture together.

Teacher's Note: Explaining "It's OPTIC-al"

If students haven't completed this strategy before, help them understand what the parts of OPTIC mean and what to look for in the picture. You may want to use the Lake Arcadia picture to explain the strategy. Keep **slide 6** displayed as a reference for the student groups as they work.

Once each group is done with their first poster, display **slide 8** and introduce the Gallery Walk/Carousel strategy. Invite student groups to rotate clockwise to another picture and fill out the OPTIC notes for the new picture. They can also add notes to the poster board about anything they observe in the picture that was not addressed.

Once all groups have rotated to every picture and completed their notes, have them return to seats, but remain with their group. Allow time for everyone to review their notes and ask questions or clear up confusion about any of the pictures.

Display **slide 9**, each group should discuss the question in the Painting a Picture strategy section of their graphic organizer. As a group, have students come to a consensus and draw a conclusion about what these pictures mean for this geographic region (i.e., Northern India), the present-day impact of the water situation there, and the future issues that may arise. Ask a few groups to share their conclusions with the class.

Teacher's Note: Points of Reference

You may wish for students to use their textbook, atlas, or Google Earth to locate the Ganges River in India as a point of reference.

Explain

Display **slide 10**. Distribute highlighters and the attached **Ganges River Facts Reading** about the river and its use to each student. As students read, have them use the Why-Lighting strategy to analyze the reading, looking for information that could help them respond to the following questions: *What is contributing to the pollution of the Ganges River? What efforts have been made to clean up the Ganges River?* Instruct students to explain why they chose to highlight specific information in the margins of the reading.

Once students have finished reading and highlighting show **slide 11**, have them share what they highlighted with an Elbow Partner, then ask a few pairs to share their answers with the class.

Possible Student Responses to the Why-Lighting Activity

Based on the reading, students should highlight information that answers each question. **What is contributing to the pollution of the Ganges River?** *Possible answers: Hindu people bathing in the river; immersing cremated ashes in the river; the 400 million people who live close to the river; tourist activities that put people and machines in the water; industrial waste; religious offerings wrapped in plastic; raw sewage; toxic metals and pesticides from industrial pollution; dumping tanning chemicals; and people's daily use of the river for bathing, washing clothes, agricultural purposes, and the resulting waste.* **What efforts have been made to clean up the pollution?** *Possible answers: Setting up programs to reduce industrial waste and building sewage treatment plants.*

If there is any information you feel the students still need to know, or if you feel that they didn't get the necessary information from the pictures and the reading, inform them about the pollution of the Ganges in more depth. Tell students that what they see happening with the Ganges River isn't unique to India, but that water pollution is an international and national concern. Like they saw with Lake Arcadia in Oklahoma, it is also a state and local concern.

Highlight the lack of accountability, government oversight, and the corruption by government officials; the difficulty in garnering local support for conservation; and the fact that local and state governments have not been able to handle the magnitude of the work. The Hindu spiritual belief that the Ganges can heal itself also hinders efforts.

Extend

Display **slide 12**. Pass out a sheet of notebook paper to each student. Ask students to think back to the picture of Lake Arcadia and consider the questions: *"What role do you play in water conservation and water pollution?"* and *"What impact does water conservation and water pollution have on more than just our personal use?"* Have students answer these two questions with a Two-Minute Paper strategy on notebook paper. Use the two minute timer on the slide to help students keep track of their time.

After their two minutes of writing, tell students they will watch an interview with the president of the Oklahoma Water Resources Board (OWRB), Julie Cunningham. Go to **slide 13** to play the video, titled "ICAP - What's in Your Water?" In the video, Cunningham addresses some of our state's water conservation and pollution issues, as well as ways the Oklahoma Water Resource Board works to clean up and conserve water.

Embedded video
https://youtube.com/watch?v=P4BAvdIznV4

Teacher's Note: Global and Local Connections

It is important for students to make the connection between the effects of pollution in the Ganges River and our own state's water protection and water conservation efforts. Discuss how water pollution is both a global and a local problem.

Evaluate

Display **slide 14**. After showing the video of the OWRB interview, discuss how we can support efforts to clean, protect, and conserve water. Have students add additional information to their Two-Minute Paper discussing how they can support efforts to clean, protect, and conserve water based upon any information they picked up from the video.

Teacher's Note: Possible Assessment Opportunity

Consider using the It's OPTIC-al as a formative assessment to check for student understanding. Additionally the Two-Minute Paper can be used to assess student understanding of the connection of human impact on water, different uses of water, and how to conserve and protect water.

Resources

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