# How To - Examine the Aral Sea

## Language Objectives

- The student will identify vocabulary associated with human-environment interaction and the Aral Sea.
- The student will participate in group work, discussions, and create a product based on the lesson’s vocabulary.

## Metacognitive Objectives

- The students will make predictions and draw conclusions based on information presented in the lesson. The students will be able to analyze the effects of the alteration to the flow of rivers.
- The student will be able to explain the effects caused by the lowering of the water level of the Aral Sea.

## Materials:

- Handout – Aral Sea Vocabulary
- Handout – Reading on the Aral Sea
- Handout – Maps of the Aral Sea (1960-2010)
- Handouts – Charts on the Aral Sea with questions
- Handout – Graphic Organizer – Cause leading to multiple effects
- Handouts – You are There (Extension)

## Prep:

- Before the lesson, have the vocabulary from the Aral Sea posted on your word wall. For maximum effectiveness, make each word interactive by folding a piece of card stock in half, writing the vocabulary term on the front, drawing an example right next to the word, and in the inside flap, write the definition of the word.
- Prepare sufficient amounts of handouts for the lesson.

## Hook:

- On the board or overhead, write “The Gulf of Mexico” and then circle it.
- Have students create a webbing diagram with several features branching off of it.
- Ask students to describe things that we get from the Gulf of Mexico. Write their responses in the webbing diagram.
- Ask students to describe the different types of businesses that depend on the Gulf of Mexico. Write their responses in the webbing diagram.
- Ask students to describe the water of the Gulf of Mexico and write their responses in the webbing diagram.
- Have students copy the completed diagram in their notes.
- Underneath their diagrams, have the students answer the following questions:
  - What would happen to the coastal wildlife if the water became saltier?
  - How would the coastal economy be impacted if the water became saltier?
- Explain to students that they are going to examine a place where this happened!
How To - Examine the Aral Sea

Guided Practice:
- Have students copy the words that are going to be used in this lesson into their notes.
- In groups of four, have the students define each word.
- Have the students create a new visual for each of the words.
- Have groups share their visuals and definitions.
- Discuss with the students their answers from the two previous questions. Ensure that the students understand the cause and effect relationship between the conditions of the Gulf of Mexico and how people and the wildlife depend on it.
- In their groups, students are to look at the three large maps of the Aral Sea.
- Have students discuss how the three maps are different and write their responses in their notebooks.
- Have students decide on how the changes demonstrated in the maps may have occurred. Have them write their reflections in their notes.
- Have students look at assorted pictures of the Aral Sea. (Do an image search using http://images.google.com)
- Ask students about the pictures that show ships stranded on dry land and how the ships ended up like that.
- As a group have students read the passage on the Aral Sea.
- Have students take turns examining the 6 Maps of the Aral Sea as a gallery walk and have them record their observations.
- Have students write out the cause of the shrinking of the Aral Sea, Also have them reflect on the multiple effects of the shrinking Aral Sea.
- Hand out the charts to each group with the corresponding questions.
- As a group students are to answer the questions in their notes.
- Discuss with each group their findings.
- Discuss with the entire class the concept of human-environment interaction.
  - Highlight that people will either adapt to their environment or change it.
  - Have students reflect on how people in the community have changed the surrounding environment.
  - Discuss whether or not there have been negative consequences with the changing of the surrounding environment.

Independent Practice:
- Hand out the graphic organizer to each student. They are to fill out the effects of the irrigation ditches on the Aral Sea.
- Each group member is to pick one of the effects and create either a hand motion to reflect the effect or role-play a characteristic of an effect.

Extension:
- Students use You are There and What are you Going to Do? Handouts and give an oral presentation as a persuasive speech.
- Students can further use the Google Image Search engine to find other examples of human-environment interaction. They can create an original PowerPoint show demonstrating what they have learned and apply it to another example. (Rain Forest/Desertification...
<table>
<thead>
<tr>
<th>What?</th>
<th>Explain It!</th>
<th>Draw It!</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raw Materials</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Irrigation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human-Environment Interaction</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
It was more than forty years ago that the former Soviet Union decided to begin the building of irrigation ditches. These ditches diverted water from the Amu-Darya and the Syr-Darya Rivers. The water was used to provide water for millions of acres of farmland. More than 60% of the water that flowed down the rivers was used for irrigation.

It was not until after the construction of the irrigation ditches were completed that problems began to occur. The Amu-Darya and the Syr-Darya Rivers also provide water for the Aral Sea. With the loss of the water flow to the Aral Sea, the water level began to drop. The Aral Sea was once the fourth largest sea in the world. Now, it is only one-third of its original size.

The Aral Sea is made of salt water. In the 1960’s the amount of salt in the water was 1%. It jumped to almost 5% by 2002. The Aral Sea was once full of fish and many types of water plants. Today, the fishing industry is gone. Almost 200 tons of salt has been left on the shores. The left over salt gets blown around by the wind. Tuberculosis and throat cancer cases have risen. Many people have died because of these diseases.
Chart #1 – Aral Sea: Water Volume and Water Surface

Chart #2 – Aral Sea: Salt Content in the Aral Sea
Vocabulary

Directions: Using the charts and your knowledge of social studies, answer the following questions.

Chart #1

1. What was the approximate water volume in the year 1980?

2. In which year was the water surface and water volume the closest after 1960?

3. How many years did it take for the water surface to drop 60% of its original level?

Chart #2

1. During what year was the salt content at 3%?

2. How many percentage points did the salt content increase from 1970 to 1990?

3. During which years was the increase in salt content the least?

Chart #1 and Chart #2

1. What connection do you see between the water level and the salt content of the Aral Sea?
The Aral Sea (1980)

Source: [http://commons.wikimedia.org/wiki/File:Aralsee.gif](http://commons.wikimedia.org/wiki/File:Aralsee.gif) - Permission granted under Creative Commons Attribution-Share-Alike 3.0
The Aral Sea (2000)

Source: http://commons.wikimedia.org/wiki/File:Aralsee.gif - Permission granted under Creative Commons Attribution-Share-Alike 3.0
The Aral Sea (2010)

Source: http://commons.wikimedia.org/wiki/File:Aralsee.gif - Permission granted under Creative Commons Attribution-Share-Alive 3.0
You are the ruler of a large country.

Over the past ten years, the economy has gotten worse. More and more people in your country are becoming unemployed. One of your advisors proposes to begin building irrigation ditches along two major rivers to create new farms. These new farms would grow cotton and other raw materials that can make money for your country.

The rivers that the irrigation ditches are to be built on both flow into a very large sea. Many people who live around the sea depend on the fishing and shipping industries the sea provides.

The nation is waiting for your decision on whether or not to build the irrigation ditches on the two rivers that flow into the sea.

Assignment: In your own words, issue a formal speech that will either begin the construction of the irrigation ditches or talk about another plan that you may have to save your nation’s economy. Use what you have learned to support your argument.