

ACTIVITY TWO:

LOOKING AT THE ZEBRA MUSSEL MENACE

TIME:	(2) 45-minute lessons
SCIENCE PROCESS SKILL:	Observing, measuring, and communicating
SCIENCE CONCEPTS:	Zebra mussels have identifiable and observable characteristics. Zebra mussel history and concerns can be identified from a video.
BENCHMARKS:	Students should: Know that changes in an organism's habitat are sometimes beneficial to it and sometimes harmful. Judge whether measurements and computations of quantities such as length, area, volume, weight, or time are reasonable in a familiar context by comparing them to typical values.
OBJECTIVE:	Students will record observations of the zebra mussel. Students will be able to describe concerns about the zebra mussel's arrival in North America.

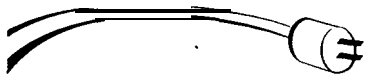
WHAT YOU OUGHT TO KNOW



A zebra mussel is a bivalve mollusk. It is a fingernail-sized clam with yellowish or brownish shells marked in wavy bands. Female zebra mussels can produce 30,000 to 1,000,000 eggs per year. These eggs develop into free-swimming larvae (called veligers) that quickly begin to form shells. After approximately three weeks, zebra mussels attach to hard surfaces called substrates. These are surfaces such as rocks, gravel, metal, crayfish, native mussels, and each other. They attach to these surfaces by using their byssal threads. Byssal threads have a strong adhesive that will dry under water and even adhere to Teflon.

Zebra mussels filter plankton from the water. Adult mussels can filter up to one liter of water per day. Diving ducks and freshwater drum eat zebra mussels. However, zebra mussels reproduce at such a rapid rate they cannot be controlled by this method alone.

The activities in Day 1 allow students to observe the characteristics of the zebra mussel. Observations are made by using the five senses. Some observations are: shiny inside, two shells per mussel, and 2 cm in length. Caution students not to make inferences, such as meat is inside the shell, unless they can see it. During Day 2 students will identify some of the environmental, recreational, and industrial problems caused by zebra mussels.



(11)

(11)

WHAT'S THE CONNECTION??

TO LANGUAGE:

Write letters to request information about zebra mussels from organizations listed on the Agencies and Officials sheet, page 12. You and the students will need this information for use in Activity Ten.

Write a physical description of the zebra mussel in the journal.

TO MATHEMATICS:

Estimate the number of zebra mussels that will occupy a 100 ml space.

TO ART

Construct a mosaic of the zebra mussel by using construction paper.

TO SOCIAL STUDIES:

Using a world map, trace the spread of zebra mussels over time.



WORDS OF WISDOM

Ballast, byssal threads, bivalve, ecosystem, exotic, molluscicides, salinity, substrate, veliger (see also glossary on page 7)

RESOURCES AT THE READY

Videos (combined onto one tape) -

“Mussel Menace...Zebra Mussels and You” (15:35)

“Zebra Mussels” (30:00)

“Help Save America’s Pearly Mussels” (30:00)

Newsprint sheets

Zebra mussel journal

For each working group:

Metric ruler

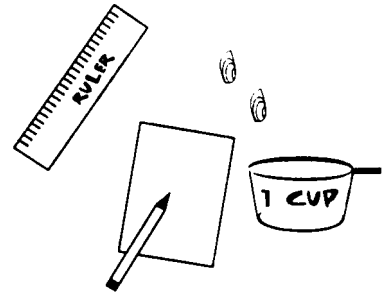
Zebra mussel shells (100 ml)

Measuring cup

Zebra Mussel Observation Sheet 2.1

Zebra Mussel Menace Record Sheet 2.2

Group folder



GETTING YOUR ACT TOGETHER



Prepare the materials in a folder for each cooperative group. On newsprint, make up a summary sheet for each of the day’s activities. The summary sheets should be titled “Zebra Mussel Observation Sheet” and “Zebra Mussel Menace Record Sheet.” Preview the first two videos described in the resources section.

TIME TO EXPERIENCE ZEBRA MUSSEL MANIA!!

DAY 1

1. Show the video "Mussel Menace...Zebra Mussels and You." The second video, "Zebra Mussels," is a PBS program that can be shown on this day or at a later time in the curriculum.
2. Divide students into cooperative learning groups.
3. Have each group measure 100 ml of zebra mussels.
(If necessary, you could have these measured out in advance.)
Before the shells are observed by the groups, have them estimate the number of mussels in the sample. Record this on the Zebra Mussel Observation Sheet 2.1.
4. Observe mussels and record observations on the Zebra Mussel Observation Sheet 2.1. You will want to support the students' observations by offering clues to the groups as needed. Some suggestions are:

What are the color variations?

Ask questions about shell symmetry and bivalve construction.

How is feel related to a particular surface that is touched?

One side will feel sharp, another smooth.

How many actual mussels were counted?

(Record this on the data sheet.)

Sound is not easy to observe. In order to observe sound, something must be done to the mussels.

An obvious smell is present. Does it change when the mussels are wet?

5. Record each group's data on your newsprint sheets. Are differences apparent? Discuss the data.



DAY 2

6. Hand out Zebra Mussel Menace Record Sheet 2.2 to each student.
7. View video again so students may complete the sheet.
8. Have the reporters summarize the data on a class chart.
9. Write group-generated answers for each question on newsprint charts.
10. Discuss and summarize the results. Each student should copy this summarized data in his/her journal.

WHAT DID YOU LEARN??

Use the group charts to generate discussion based on observations made. The students' senses should have been used to observe zebra mussel characteristics. Taking measurements of length, width, and mass also should have helped students to identify physical aspects of zebra mussels. While watching the video, did each student make notes and contribute to the total information produced by their group? Each group member should be able to answer questions based on physical observations of zebra mussels and information gained from the video. Can they answer your questions?

WAIT, THERE'S MORE. . .

Use information from the chart to have the class draw conclusions from the following questions:

1. Why are zebra mussels considered a menace?
2. How do zebra mussels affect you?
3. How did zebra mussels travel from Europe to North America?
4. How are zebra mussels transported throughout the United States?
5. What are some ways to prevent zebra mussel spread?