

Mussel Walk Activity



AIS Game Show

Help to share your knowledge of aquatic invasive species with your peers!

◆ Grade Level(s)

Middle School

◆ Subject Areas

Life Science, Environmental Science, Ecology, and Human Impacts

◆ Key Topics

Aquatic Invasive Species (AIS), invasive zebra and quagga mussels

◆ Duration

Preparation Time: 20 min

Activity Time: 15 min

◆ Setting

Outside or inside (Groups)

◆ Skills

Communicating information

◆ Standards

NGSS & MT Science Std.:

MS-LS2-2: Construct and explanation that predicts patterns of interactions among organisms across ecosystems.

ESS3.C: Interdependent Relationships in Ecosystems

CROSSCUTTING CONCEPT(S):

Patterns

SCIENTIFIC & ENGINEERING

PRACTICE(S):

Constructing Explanations and Designing Solutions

Overview

Students will test their knowledge about aquatic invasive species (AIS) in an interactive game show activity.

Objectives

Students will be able to:

- answer questions about common AIS traits, local AIS threats, and invasive mussels.

Materials

Warm Up / Activity / Wrap Up

- Timer
- Game show questions (Teacher Resources #1-17)
- 6 small white boards, 6 dry erase markers, 6 erasers
- 2 plastic containers with ~20,000 and ~1,000,000 quinoa grains
- 2L, 1L, and 0.5L plastic bottles
- Photo or display of quagga mussels growing on a pipe
- 1 teacher table and 3-6 student tables (see Advanced Preparation notes below)
- *Optional: prizes for the winning teams*

Advanced Preparation

- Make arrangements to reserve and pick up the Mussel Walk Trunk with the materials above from FLBS.
 - Call (406) 872-4500 or make a request on the FLBS website: <https://flbs.umt.edu/newflbs/outreach/k-12-education/>
- Laminate or place Game Show Questions in plastic sheets
- Prior to the activity, set up 6 student game show stations.
 - Set up a small instructor table with 6 student tables or work areas placed in a semi-circle in front of the instructor table. *Alternatively, set up 3 large tables with a student station at each end.*
 - Place a small whiteboard, dry erase pen, and eraser on each table or student work area
 - Place the game show questions, quinoa containers, and 3 plastic bottles on the instructor table.



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AIS Game Show

Procedure

◆ Activity (13 minutes)

- Divide the students into 5-6 groups and ask them to stand at the game show stations.
- Explain that they will be working in their groups to participate in an AIS Game Show Activity.
 - For each question, hold it up and read it to the students. Students get 1 minute to record their answer on their whiteboard (hiding it until ready). After one minute, students share their answers. The teacher assigns points and the students record the points on their whiteboard.
- Use the following materials and answer key to assign the points:
 - #1: What are three things all aquatic invasive species have in common? (grow fast, reproduce quickly, spread easily, out-compete native species)
 - #2: What year did zebra mussels arrive in the United States? (1986)
 - #3: How many eggs can one adult female zebra mussel produce in one cycle? **Hold up the smaller quinoa container and have them guess.** (~40,000)
 - #4: How many eggs can one adult female zebra mussel produce each year (25 cycles)? **Hold up the larger quinoa container and have them guess.** (~1 million)
 - #5: How many liters of water can one adult zebra mussel filter in one day? **Hold up the 0.5L, 1L, and 2L bottle as choices to choose from.** (1L/day)
 - #6: How many months did it take for the mussels to grow this much? **Show the FLBS quagga mussel display or hold up the photo (Teacher Resources #7) as an example?** (6 months)
 - #7: What are two differences between a native and an invasive mussel? (Invasive mussels have planktonic larvae and byssal threads; Native mussels have glochidia and need a fish host)
Bonus: Name a native mussel of Montana. (Western Pearlshell, Giant Floater, or Fatmucket)
 - #8: What are two aquatic invasive species currently found in the Flathead Basin watershed? (Ex. Flowering rush and curly-leaf pondweed in Flathead Lake, Eurasian milfoil in Beaver Lake and Clark Fork River)
 - #9: What are two native fish that could be impacted by a mussel invasion? (Bull Trout and Westslope Cutthroat Trout)
 - #10: What are three businesses that could be impacted by a mussel invasion? (Ex. any local restaurant, hotel, resort, lake or river fishing guides, river rafting companies, etc.)

TIE BREAKER QUESTIONS:

- #11: What are three states that currently do not have invasive zebra/quagga mussels? (Idaho, Oregon, Washington, Hawaii, Alaska, Florida)
- #12: What is the last major U.S. watershed that has NOT been invaded by mussels? (Columbia River Basin)
- #13: Where did the zebra mussels come from specifically? (Caspian, Black, and Azov Seas)
- #14: How long does a zebra mussel larvae stay planktonic? (~1 month)
- #15: How long can a zebra mussel live? (~5-6 years)
- #16: How can you get rid of invasive mussels? (molluscicide or water draw down)

◆ Wrap Up (2 minutes)

- Ask student to count up points, conduct tie breaker if needed, and pass out prizes to winning group.

Acknowledgements

Many thanks to Hilary Devlin for her contributions to this lesson.



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What are three
things all aquatic
invasive species
have in common?

15 points

What year did
zebra mussels
arrive in the United
States?

5 points

How many eggs
can one adult
female produce in
one cycle?

5 points

How many eggs can
one adult female
produce each year?

Hint: Up to 25 cycles

5 points

How many liters of
water can one
adult zebra mussel
filter in one day?

5 points

How many months
did it take for the
mussels to grow
this much?

5 points



What are 2 differences
between a native and
an invasive mussel?

Bonus:

Name a native mussel of MT

10 points



What are 2 aquatic
invasive species
currently found the
Flathead Basin
watershed?
10 points

What are 2 native
fish that could be
impacted by a
mussel invasion?
10 points

**What are 3
businesses that
could be impacted by
a mussel invasion?**

15 points

What are 3 states that
currently don't have
invasive
zebra/quagga
mussels?
15 points

What is the last major
U.S. watershed that
has NOT been
invaded by mussels?

15 points

Where did the
zebra mussels
come from
SPECIFICALLY?

5 points

How long does an
invasive mussel
larvae stay
planktonic?

5 points

How long can
a zebra mussel
live?

5 points

How can you get rid of invasive mussels?

5 points