

Argument Tool

Question

What is the question that you are investigating?

Has the quagga mussel had a positive or negative effect on the Lake Michigan ecosystem?

Claim A

What is a claim you could argue?

The quagga mussel has had a positive effect on the Lake Michigan ecosystem.

Claim B

What is a claim you could argue?

The quagga mussel has had a negative effect on the Lake Michigan ecosystem.

The evidence that supports this claim is . . .

Water clarity has increased from 16.4 ft average in the 1980's to 28.4 ft average in the 2000's. Zebra mussels have decreased from a high average population in 2000 of up to 100,000 m² to 0 in 2010.

The evidence that supports this claim is . . .

Diporeia (zooplankton) have decreased from 20,000/m² in 1994 to less than 3,000/ m² in 2010. Many fish (trout, salmon, Whitefish, etc) depend on the diporeia for food.

Scientific Reasoning: Evaluating the Evidence and Claim

Critique the quality and strength of the evidence that supports this claim.

An increase in water clarity might mean more plants would grow, but we have no data on this. Even though zebra mussels have decreased, that has not lead to an increase in plankton because the quagga mussels are eating the diporeia (even more than the zebra mussels were).

Critique the quality and strength of the evidence that supports this claim.

The plankton levels have decreased even more than when the zebra mussels invaded, and there are many fish that depend on this plankton for food. These fish populations have probably decreased due to the quagga mussels.

Argument Tool

Continued

Name _____

*SAMPLE STUDENT
RESPONSE*

Activity 4.5

Constructing a Scientific Argument

Decide which claim you think is best supported by the evidence and scientific reasoning. Using the criteria below and the information in the boxes you have completed, write a scientific argument that includes:

- The scientific question
- Your claim (that is best supported by evidence and reasoning)
- Relevant evidence that supports your claim
- Scientific reasoning that critiques the evidence and evaluates your claim

Scientific Argument

Has the quagga mussel had a positive or negative effect on the Lake Michigan ecosystem?

My claim is that the quagga mussel has had a negative effect on the Lake Michigan ecosystem. The evidence that supports this claim is that the diporeia population is much lower than it was before the quagga mussels were introduced from 20,000/m² in 1994 to less than 3000/m² in 2010, even lower than when the zebra mussel population was at its highest. The diporeia are important prey for many predators such as trout and salmon. My scientific reasoning is that the decrease in the diporeia population means that all predators that eat the diporeia, including salmon and trout, will therefore have less to eat and their populations will decline. Therefore, this is the claim that fits best with all of the data on quagga mussels and their effect on the Lake Michigan ecosystem.

Critique of the Rebuttal

Other people might claim _____. I think the problem with this argument is _____.

Other people might claim that the quagga mussel has had a positive effect on the Lake Michigan ecosystem because the water is clearer and there are fewer zebra mussels. I think the problem with this argument is that there are more negative than positive effects from the quagga mussel, like the decrease in Diporeia which many fish depend on for food.