

Explanation Tool

Question

What is the scientific question you are investigating?

What is the long-term effect of zebra mussels on the factor you chose? (rotifers)

Evidence

What are the science observations or data that address your question?

Between 1990 and 2000 the zebra mussel population increased from zero to about 1300/m². The average rotifer population went from 409/L to 161/L. Between 2000 and 2013, the zebra mussel population decreased slightly to an average of 1085/m². The average rotifer population increased slightly to an average of 186/L.

Science Concepts

What science concepts are connected to the evidence and might help answer the question?

This is a predator/prey relationship. Zebra mussels are the predators and rotifers are the prey.

Scientific Reasoning

How do the science concepts connect to the evidence and to the question you are trying to answer?

Normally as the population of predators increases the population of prey will decrease, and as the predator population decreases the prey population increases. The evidence shows this happening with zebra mussels and rotifers.

Claim

What claim can you make based on the evidence and reasoning?

If the zebra mussel population increases, the rotifer population decreases, but if the zebra mussel population decreases the rotifer population will increase.

Explanation Tool

Continued

Name _____ **SAMPLE STUDENT
RESPONSE**
Activity 4.4

Construct a Scientific Explanation

Using the information in the boxes you have completed, write a scientific explanation that includes:

- The scientific question
- Your claim
- Relevant evidence that supports your claim
- Science concepts that are connected to the evidence
- Scientific reasoning that links the evidence and science concepts to the claim

Scientific Explanation

What is the long-term effect of zebra mussels on the factor you chose? (rotifers)

My claim is that if the zebra mussel increases, the rotifer population decreases, but if the zebra mussel decreases the rotifer population will increase. The evidence that supports my claim is that the patterns in the graph show that as the population average of zebra mussels increased (1990-2000), the population average of rotifers decreased. However, when the population of zebra mussels decreased (2000-2013), the rotifer population increased. Because zebra mussels are predators that prey on rotifers, a larger zebra mussel population will eat more rotifers, causing a decrease in the rotifer population. The reverse will happen if the predator population (zebra mussels) decreases: the prey population (rotifers) will increase. This is what normally happens in predator-prey relationships: when a predator population increases, it causes the prey population to decrease, and vice versa. This is an example of a cause and effect relationship.