



Maine  
Department of  
Education

**GRADE**

**5**

**Maine Science Assessment**  
Released Items (2023)



**New Meridian**

Use the information from Waves and Movement to answer questions 1-2.

### **Waves and Movement**

After every dance class, Kay and her friends notice that a few of the empty water bottles near the sound speakers have fallen over.

Kay decides to carry out an investigation. She places a line of empty water bottles in a straight row, all the same distance from the sound speakers.



When Kay plays a song for one minute at three different volumes, she observes the bottles to see how many fall over. She then records her results in a table.

Bottles at Three Different Volumes	
Volume	Number of Bottles that Fall Over
loud	7
moderate	6
soft	0

Kay does an additional investigation. She keeps the volume the same but plays a tone instead of a song. She sets up the water bottles the same as she did in her previous investigation and then plays a low-pitched tone through the speaker. She does this multiple times by changing the pitch each time and records her observations.

Bottles at Three Different Pitches	
Volume	Number of Bottles that Fall Over
high	3
medium	5
low	8

- Based on the results of **both** investigations, which property of sound can cause an object to move?
  - (A) pitch only
  - (B) volume only
  - (C) pitch and volume both
  - (D) neither pitch nor volume
- Which combination of volume and pitch is the **best** to make the highest number of water bottles fall over? Mark **one** combination of pitch and volume in the chart.

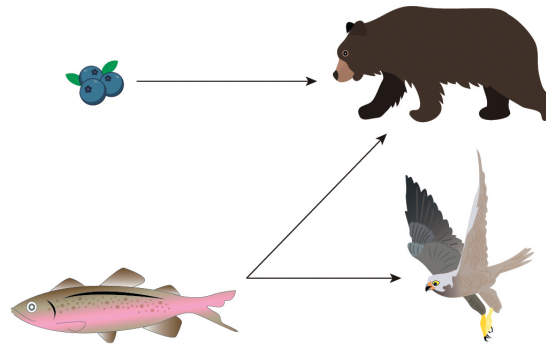
	Loud Volume	Moderate Volume	Soft Volume	Any Volume
High Pitch	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Medium Pitch	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Low Pitch	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Any Pitch	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Use the information from Effects of Building a Dam to answer questions 3-7.

### Effects of Building a Dam

Aaden is managing a large nature preserve. He is studying the relationships between the plants and animals in the area. He wants to understand how a dam in the nature preserve may have affected the population of bears. To better understand the effects of the dam on the bear population, he researches the role bears play in this ecosystem.

#### Food Chain

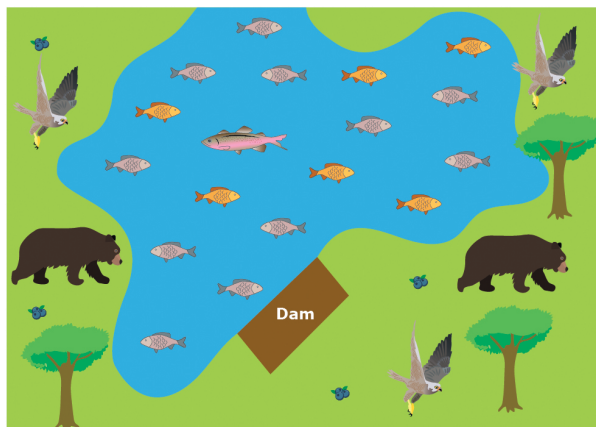


Aaden finds a map of the nature preserve before the dam was built.

#### Map Before the Dam



#### Map After the Dam



3. Which **two** factors are responsible for the change in the number of bears in this nature preserve due to the damming of the creek? Select **two** factors.
- (A) less habitat
  - (B) fewer eagles
  - (C) fewer large fish
  - (D) more small fish
  - (E) more blueberries

4. Aaden is studying maps of the area and wonders how building the dam has affected the bear population.

What effects does the dam have on the bear population? Write the letter of **three** observations in the correct place in the chart.

Positive Effects	Negative Effects

- A. Bears have less habitat.
- B. Bears have less food to eat.
- C. There are no negatives.
- D. There are no positives.
- E. Bears have less competition.

5. Aaden wants to figure out whether building the dam was good or bad for the bears.

Was building the dam a positive change for the bear population? Use details from **both** maps to explain your answer.

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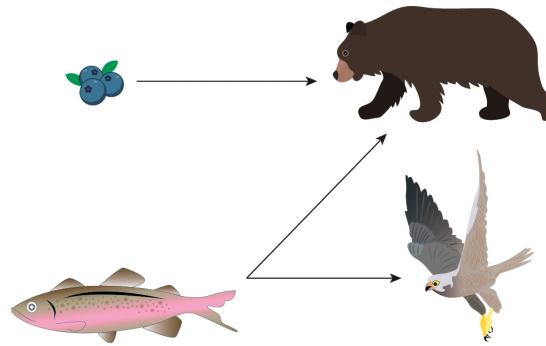
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## Effects of Building a Dam

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### Food Chain

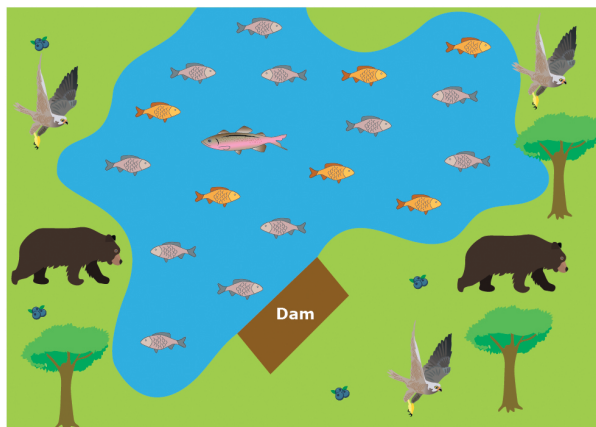


Aaden finds a map of the nature preserve before the dam was built.

### Map Before the Dam



### Map After the Dam



6. Aaden wants to consider how he could increase the population of bears in the nature preserve.

Would each solution be likely to increase the bear population? Mark **Yes** or **No** for each solution.

	<b>Yes</b>	<b>No</b>
Plant more blueberry bushes near the lake.	<input type="radio"/>	<input type="radio"/>
Drain the lake and restore the creek.	<input type="radio"/>	<input type="radio"/>
Plant more trees near the lake.	<input type="radio"/>	<input type="radio"/>
Stock the lake by adding large fish.	<input type="radio"/>	<input type="radio"/>
Stock the lake by adding small fish.	<input type="radio"/>	<input type="radio"/>

7. Another nature preserve in the same area and with similar organisms wants to know how a dam might affect their ecosystem. Select **all** that apply.

Which effects might this preserve expect to see in their ecosystem?

- (A) decrease in large fish population
- (B) less habitat for organisms that live on land
- (C) more shelter for the organisms that live on land
- (D) increase in population of organisms that live on land
- (E) fewer food resources for many of the organisms that live on land

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