

## Default Question Block

### Grade 5 - Form A Task #1 Lake Bubbles

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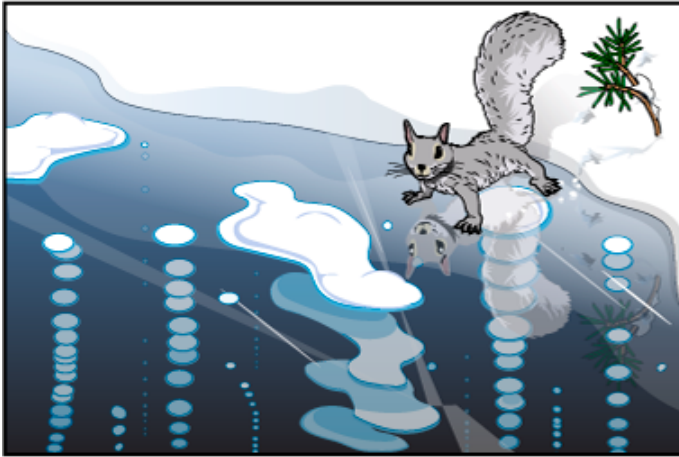
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State Student ID

Use the information provided in any part of this task to answer the questions.

While walking across a frozen lake, a hiker discovered something unusual in the ice. It looked like bubbles were frozen in the ice. The hiker had not seen this in other frozen lakes. The hiker wanted to figure out what was causing these bubbles in the ice.

Lake Ice with Bubbles



Normal Lake Ice



### Question 1

The hiker drilled a hole in the ice and discovered there was gas trapped in the bubbles. She collected some gas from the bubbles and tested it. The test results were compared to known gases.

#### Lake Gas Test Results

Gas	Dissolves in Water	Color	Odor	Flame Test
lake gas	no	colorless	odorless	burns

#### Other Gas Test Results

Gas	Dissolves in Water	Color	Odor	Flame Test
oxygen	yes	colorless	odorless	does not burn
carbon dioxide	yes	colorless	odorless	does not burn
methane	no	colorless	odorless	burns
nitrogen	no	colorless	odorless	does not burn

Use the tables to determine which gas is found in the lake bubbles.





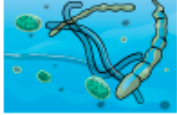
- A) oxygen  
 B) carbon dioxide  
 C) methane

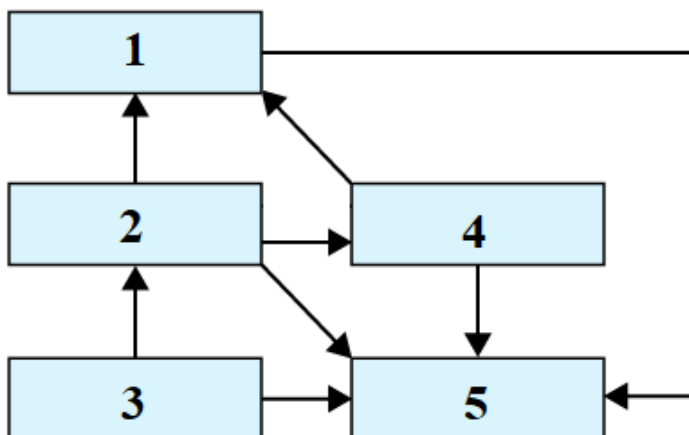
D) nitrogen

## Question 2

The hiker thought the methane bubbles could be caused by organisms living in the lake. The table shows five organisms in the lake and how they obtain energy.

Complete the model of the lake's ecosystem to explain how matter moves among these 5 organisms.

Organism	Picture	How it obtains matter and energy
Largemouth bass		eats sunfish and invertebrates
Sunfish		eats invertebrates
Water plants		energy from the sun and matter from the air and water
Invertebrates		from water plants
Bacteria		from dead organisms

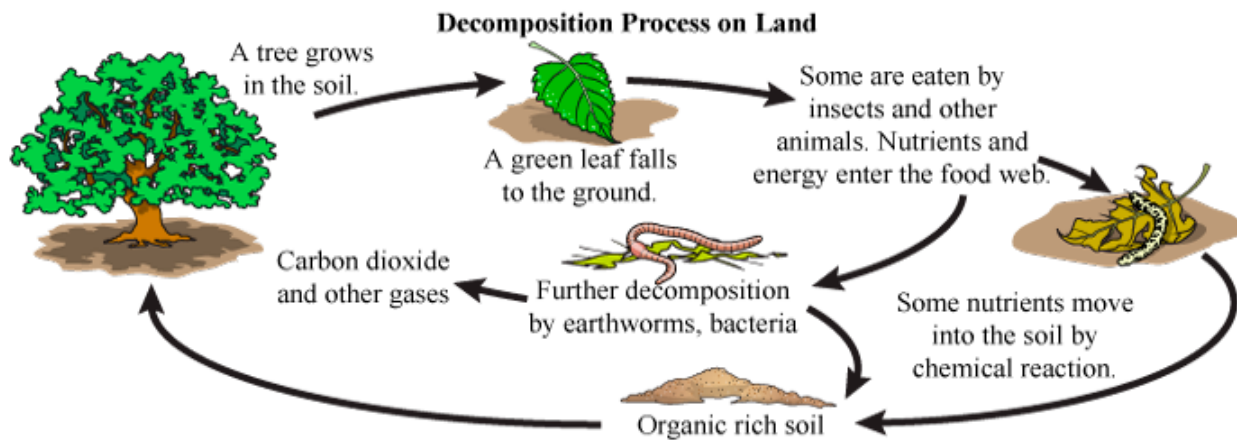


Enter the number of the box next to the organism that should be in that box.

- Bacteria
- Invertebrates
- Largemouth Bass
- Sunfish
- Water plants

### Question 3

All organisms produce waste products. To figure out which lake organism(s) produces methane as a waste product, the hiker investigates the decomposition process.



Use the model of the land decomposition process to identify which organism is producing methane gas in the lake.

- A) sunfish
- B) bacteria
- C) water plants
- D) invertebrates
- E) largemouth bass

Use the information provided in any part of this task to answer the questions.

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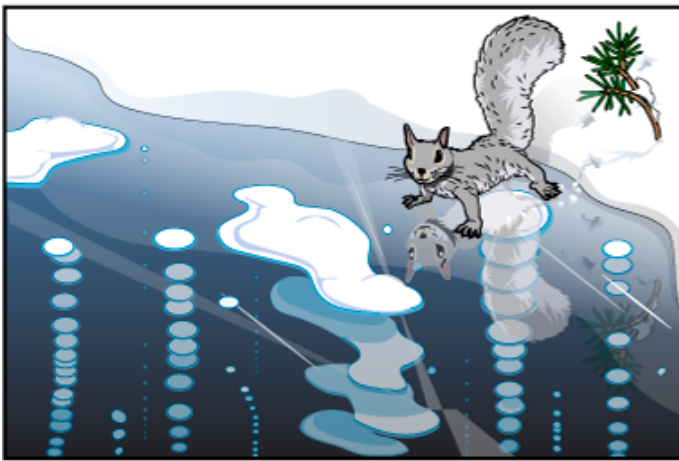
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While walking across a frozen lake, a hiker discovered something unusual in the ice. It looked like bubbles were frozen in the ice. The hiker had not seen this in other frozen lakes. The hiker wanted to figure out what was causing these bubbles in the ice.

**Lake Ice with Bubbles**

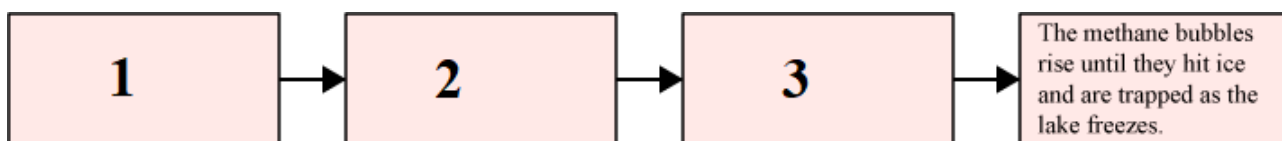


**Normal Lake Ice**



#### Question 4

Complete the model to explain how decomposition by bacteria is the cause of the methane bubbles in the lake. Move each statement to create the sequence of events that results in the methane bubbles.



Drag one item into each box that matches the numbers in the diagram.

#### Items

Methane is released as a waste product.

1

Methane dissolves in the water, making bubbles.

Bacteria in the lake consume the organisms.

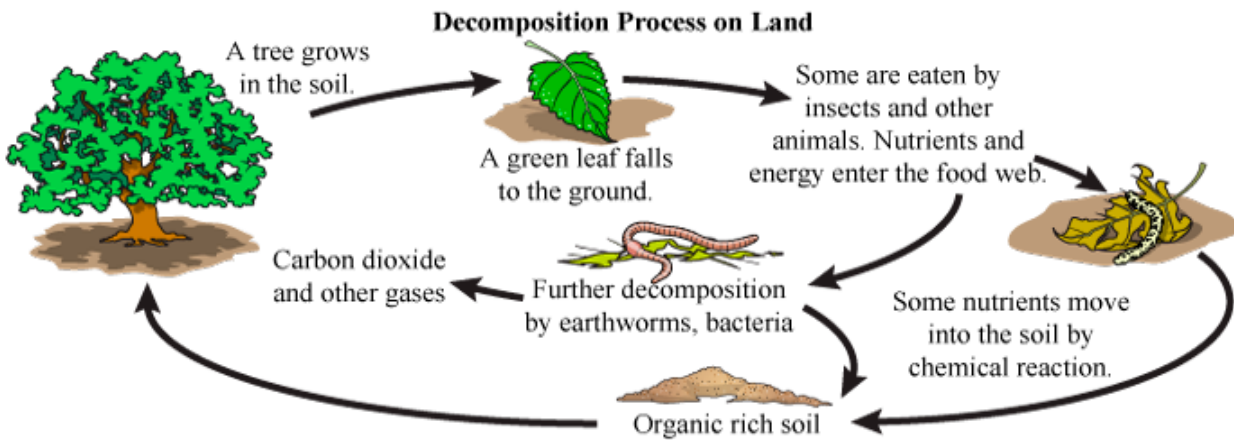
Bacteria release heat as they consume the organisms.

Organisms die and sink to the bottom of the lake.

As the organisms sink, water pressure forces methane out of them.

2

3



**Question 5**

Construct an explanation citing evidence from the text, table, and models to explain how the frozen lake bubbles are an example of an interaction between the biosphere and the atmosphere.



## Student Feedback

### Feedback Question #1

How interesting was the task you just completed?

1 star is not interesting and 5 stars is very interesting.

### Feedback Question #2

How difficult was the task as a whole?

1 star is not difficult and 5 stars is very difficult.

### Feedback Question #3

Please rate the difficulty **to understand how to respond to each question.**

1 star is not difficult and 5 stars is very difficult.

Question 1

Question 2

Question 3

Question 4

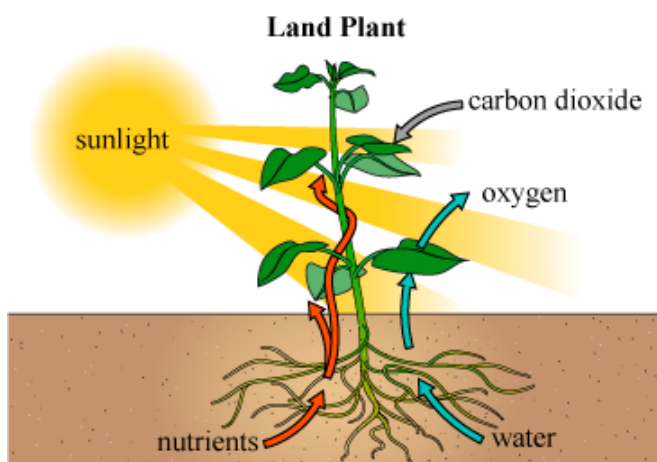
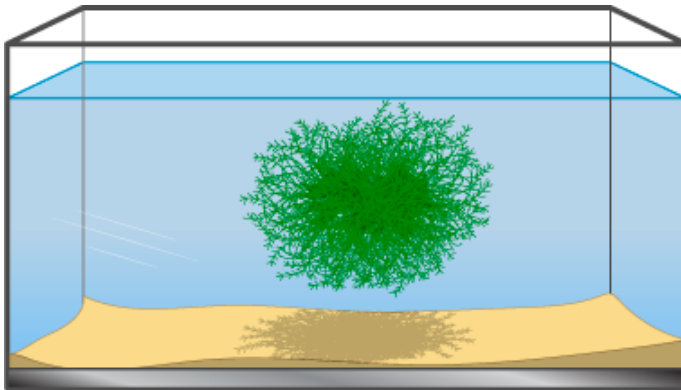
Question 5

## Grade 5 - Form A

### Task #2 Plant Problems

Use the information provided in any part of this task to answer the questions.

Java moss is a popular plant for aquariums because it is easy to grow. It also provides food to some species of fish and creates hiding places for small fish and shrimp. Java moss has no roots, and its leaves are very small. Java moss does not grow in the air. It can survive and grow completely underwater.



Land plants take in water and nutrients through their roots. Using their leaves, land plants take in carbon dioxide from the air and light from the sun to photosynthesize. The carbon dioxide and



water are chemically combined using sunlight as an energy source. The result is energy for the plant in the form of sugar. The plant can then use oxygen and the stored sugar for respiration to generate energy to grow.

### Question 1

**This question has two parts. Answer Part A, then answer Part B.**

#### Part A

Based on the text, what do land plants need to survive?

- A) soil, sunlight, and air
- B) water, soil, and sunlight
- C) water, nutrients, sunlight, and air
- D) soil, nutrients, sunlight, and water

#### Part B

Based on what you learned about what land plants need to survive, what questions are MOST relevant to figure out how the Java moss plant survives underwater?

Select each question you want to choose.

- A) Does the Java moss plant need air to survive?
- B) Does the Java moss plant need soil to survive?
- C) Does the Java moss plant need fish to survive?
- D) Does the Java moss plant need algae to survive?
- E) Does the Java moss plant need water to survive?
- F) Does the Java moss plant need sunlight to survive?

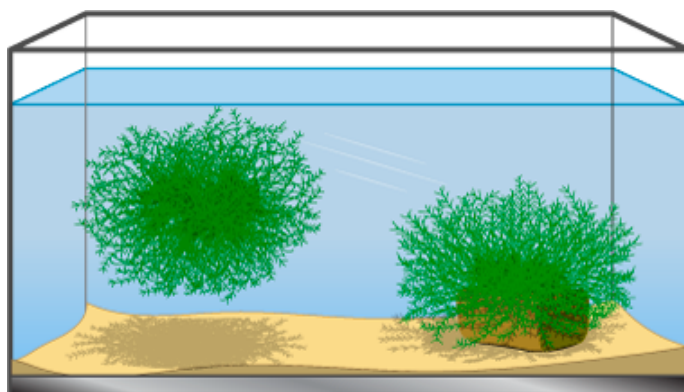
### Question 2

**This question has two parts. Answer Part A, then answer Part B.**

The student conducts an investigation to see if the Java moss plant needs soil to survive.

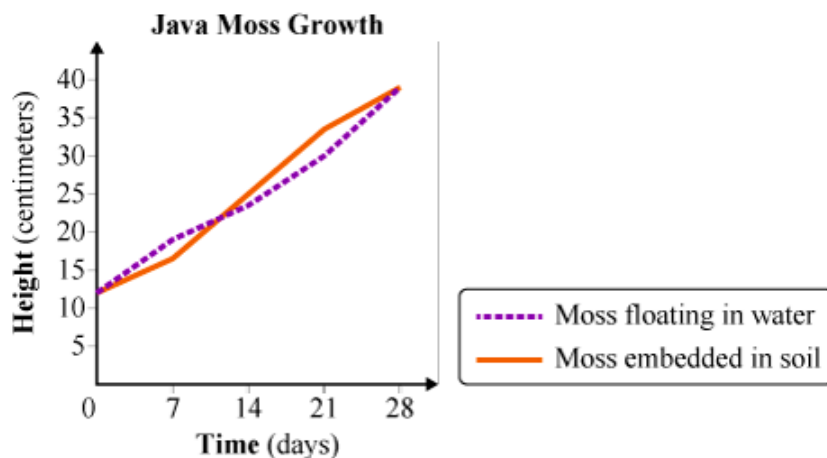
- Two Java moss plants that are the same length are used.
- One Java moss plant is planted in a pot with soil and placed at the bottom of an aquarium.
- The other Java moss plant is left floating in the aquarium.

- The plants are measured every Friday for 28 days.



Java moss  
floating

Java moss  
embedded in soil



### Part A

Which claim can be made using the data from this investigation?

- A) Java moss plants need soil to survive and grow.
- B) Java moss plants do not need soil to survive and grow.

### Part B

Which evidence supports the claim made in Part A?

- A) The Java moss plant embedded in soil grew faster than the Java moss plant floating in water.
- B) The Java moss plant embedded in soil grew slower than the Java moss plant floating in water.
- C) The Java moss plant embedded in soil and the Java moss plant floating in water grew at the same rate.
- D) The Java moss plant embedded in soil and the Java moss plant floating in water grew at different rates.

### Question 3

Read the text and select the evidence that explains where water plants like Java moss get nutrients to survive. Select a sentence you want to choose, then select "evidence".

Nutrients are needed for all plants to survive.

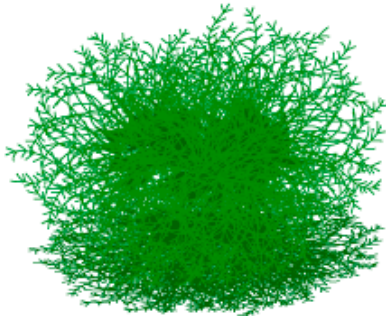
Land plants obtain nutrients from the soil.

Many water plants float in the water or on the surface, not in soil.

Java moss, a water plant commonly used in aquariums, is found in lakes with nutrient-rich water. It lives entirely underwater except for its small flowers.

Java moss's tiny, overlapping leaves are oval shaped.

### Question 4



Land plants need carbon dioxide from the air to survive. Using the information from the text and images, determine which claims can be made about water plants. Select all the claims that can be made.

- A) Water plants do not need oxygen to survive.
- B) Water plants need carbon dioxide to survive.
- C) Water plants do not need nutrients to survive.
- D) Water plants do not make sugar during photosynthesis.
- E) Water plants do not perform respiration to use their food.
- F) Water plants perform photosynthesis to make their food.
- G) Water plants use a source other than the sun for photosynthesis.

### Question 5

From this list, identify the resources that Java moss needs to survive and grow, even though it lives underwater.

- air
- soil
- water
- oxygen
- sunlight
- carbon dioxide

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Question 5

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