

**New Meridian**

Maine Science Assessment Released Items  
(2022)  
Grade 5

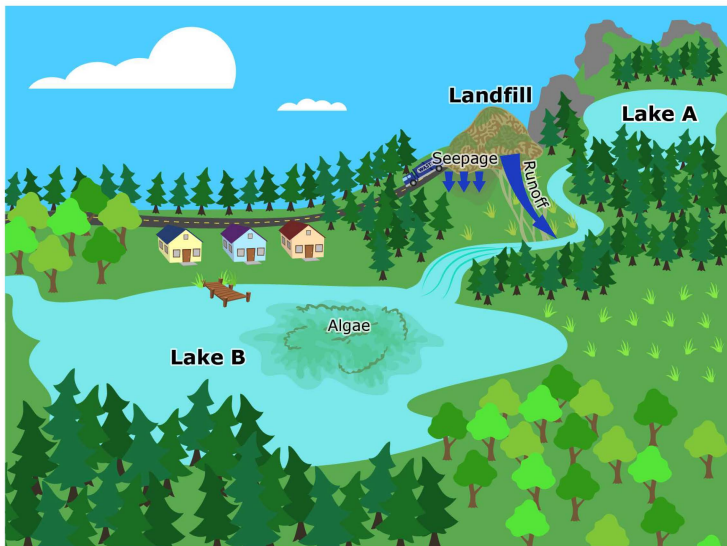
Included in this document are items and their associated stimuli that were operationally administered on the Maine Science Assessment. The stimulus is on the left, and the item is on the right, consistent with how the information is presented online in ADAM. For each item, the correct answer is provided, along with the Next Generation Science Standards (NGSS) to which it aligns. This includes the disciplinary core idea (DCI), science and engineering practice (SEP), and cross-cutting concept (CCC). In some cases, one of these dimensions may not apply.

**A note on achievement levels:** An achievement level of either Well Below State Expectations, Below State Expectations, At State Expectations, or Above State Expectations is associated with the earned scaled score for entire assessment for each student. For example, for the Grade 5 assessment, a scaled score of 42 would be associated with the achievement level of At State Expectations.

Each of these released items has an achievement level listed with it. This simply represents where in the range of scores that particular item fell. It can be used as an example of what a student performing at that particular level can do. However, it is the sum of the performance of the student on the entirety of the assessment that determines their achievement level, not just one particular item.

# Algae Bloom

Clair and Rashaun want to swim in Lake B near their homes, but it is covered with algae. However, Lake A, a few kilometers away, has clear water. Clair learns that pollutants from landfills can seep through the soil to reach the groundwater and also enter nearby streams as runoff.



Clair and Rashaun hope to find a solution to the algae problem. They listed their solutions in a table.

| Solution        | Image |
|-----------------|-------|
| Raised Barrier  |       |
| Plastic Liner   |       |
| Shallow Channel |       |

1. Rashaun claims that the landfill is the most likely cause of the algae growth.

Which evidence supports this claim?

- A The landfill has polluted the vegetation around Lake B.
- B The landfill has polluted a stream that flows into Lake A.
- C The landfill has polluted the stream that flows into Lake B.
- D The landfill has polluted the groundwater that seeps into Lake A.

1 point

## Standards Alignment

Discipline: Earth and Space Science  
 NGSS Topic: Earth's Systems

DCI: ESS3.C

Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth's resources and environments.

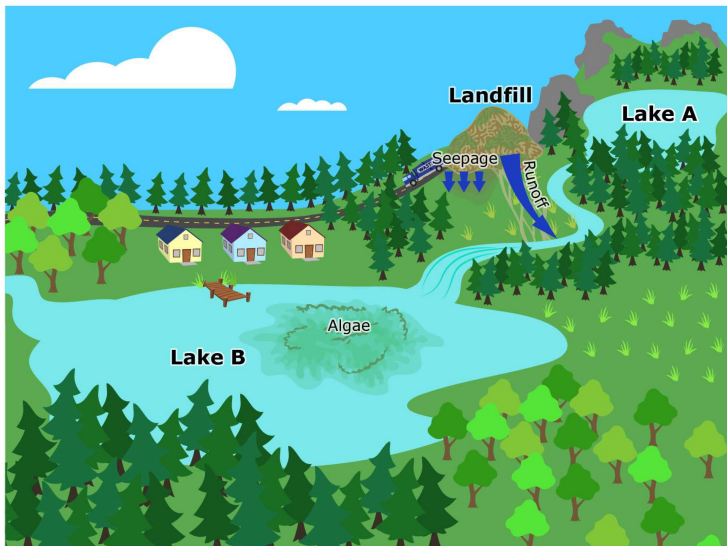
SEP2: Developing and using models

CCC4: Systems and system models

Achievement Level: Well Below State Expectations

# Algae Bloom

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| <b>Shallow Channel</b> |       |

2. After determining how the pollution gets to Lake B, Clair wonders why pollution causes algae in the lake.

Which statement best describes why there are algae in Lake B?

- A** Algae feed on the waste from human activities that pollute Lake B.
- B** Lake A has less water and cannot hold as much pollution as Lake B.
- C** Algae feed on the air pollution from the landfill that is blown into Lake B.
- D** Lake A receives less pollution because it is further from the landfill than Lake B.

**1 point**

## Standards Alignment

**Discipline:** Life Science

**NGSS Topic:** Matter and Energy in Organisms and Ecosystems

**DCI:** LS2.B

Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die. Organisms obtain gases and water from the environment and release waste matter (gas, liquid, or solid) back into the environment.

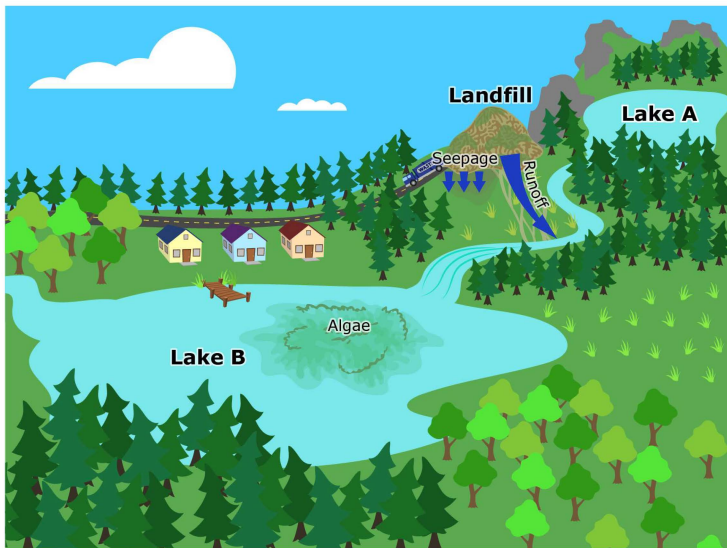
**SEP2:** Developing and using models

**CCC4:** Systems and system models

**Achievement Level:** At State Expectations

# Algae Bloom

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| Plastic Liner   |       |
| Shallow Channel |       |

3. Clair and Rashaun decide to model how the pollutants make their way from the landfill to the lake.

What is the correct path that the pollutants take? Enter 1, 2, 3, or 4 into each box to show the order of steps in the path, with 1 being the first step and 4 the last.

- |                             |   |  |
|-----------------------------|---|--|
| Lake B                      | 4 | <b>1 point for all four in the correct order</b> |
| Runoff                      | 2 |  |
| Stream                      | 3 |  |
| Waste from human activities | 1 |  |

## Standards Alignment

Discipline: Earth and Space Science  
 NGSS Topic: Earth's Systems

### DCI: ESS3.C

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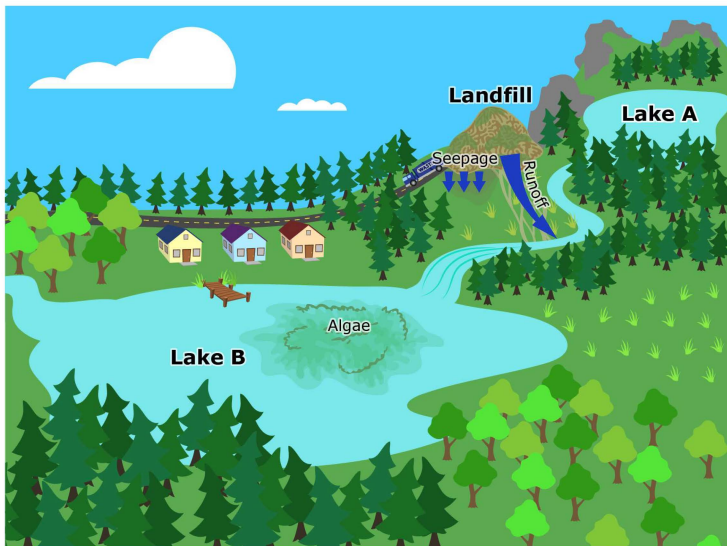
SEP2: Developing and using models

CCC4: Systems and system models

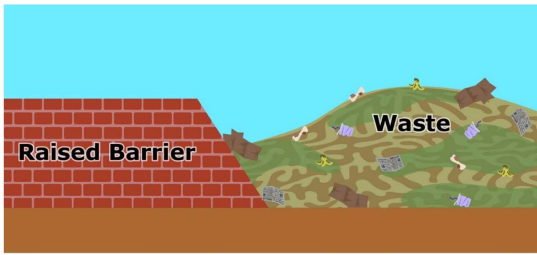
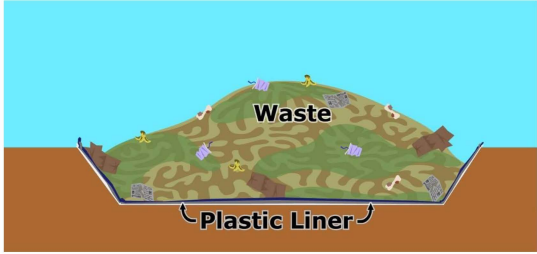

Achievement Level: Below State Expectations

## Algae Bloom

Clair and Rashaun want to swim in Lake B near their homes, but it is covered with algae. However, Lake A, a few kilometers away, has clear water. Clair learns that pollutants from landfills can seep through the soil to reach the groundwater and also enter nearby streams as runoff.



Clair and Rashaun hope to find a solution to the algae problem. They listed their solutions in a table.

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| Plastic Liner   |  |
| Shallow Channel |  |

4. After considering the different solutions to the problem, Clair decides that using a raised barrier will best prevent pollutants from the landfill from reaching Lake B.

Which statement best states whether this solution will work?

- A The solution will work because a raised barrier reduces runoff.
- B The solution will work because a raised barrier reduces seepage.
- C The solution will not work because a raised barrier will not reduce runoff.
- D The solution will not work because a raised barrier will not reduce seepage.

1 point

### Standards Alignment

Discipline: Earth and Space Science  
NGSS Topic: Earth's Systems

#### DCI: ESS3.C

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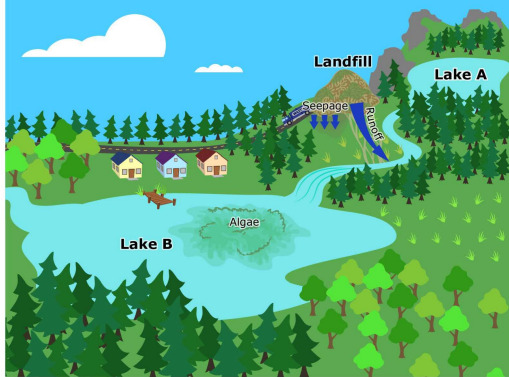
SEP2: Developing and using models

CCC6: Structure and Function

Achievement Level: Above State Expectations

# Algae Bloom

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Clair and Rashaun hope to find a solution to the algae problem. They listed their solutions in a table.

| Solution               | Image   |
|------------------------|---|
| <b>Raised Barrier</b>  | A cross-section diagram showing a brick wall labeled 'Raised Barrier' separating a hill of 'Waste' from a body of water.      |
| <b>Plastic Liner</b>   | A cross-section diagram showing a hill of 'Waste' with a 'Plastic Liner' underneath it, preventing seepage into the ground.   |
| <b>Shallow Channel</b> | A cross-section diagram showing a 'Shallow channel' between a hill of 'Waste' and a body of water, intended to divert runoff. |

5. Clair and Rashaun researched different solutions to prevent the pollution in the landfill from reaching Lake B.

Which solution from the table is the best solution to prevent algae from growing in Lake B? Identify a method and explain how this would prevent algae growth in Lake B.

**B**   *I*   U   |   ☰   ☰

2 points possible, can earn partial credit

See next page for rubric.

## Standards Alignment

Discipline: Earth and Space Science

NGSS Topic: Earth's Systems

DCI: ESS3.C

Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth's resources and environments.

SEP2: Developing and using models

CCC6: Structure and function

Achievement Level:

1 point = Below State Expectations

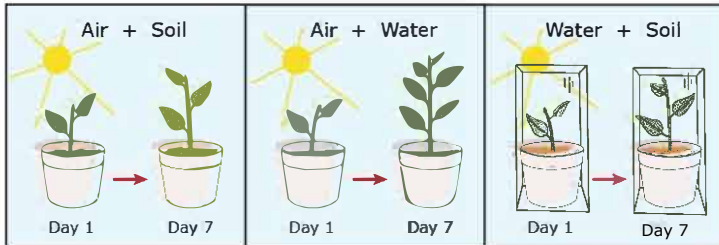
2 points = At State Expectations

| Points | Qualities of the Student Response   |
|--------|---|
| 2      | <p>The response must identify the plastic liner as the best solution to prevent algae growth and explain that the plastic liner is an impermeable barrier that will help prevent pollutants from entering the groundwater that could feed into the creek or lake B.</p> <p><b><u>Example Student Response:</u></b></p> <p>The plastic liner because the pollutants cannot penetrate it and enter the water around lake B.</p> |
| 1      | <p>The response demonstrates a partial understanding of the prompt. The response must include only one of the following:</p> <ul style="list-style-type: none"><li>• identifies the plastic liner but does not provide an explanation.</li><li>• provides an explanation but does not specifically identify the plastic liner</li></ul>   |
| 0      | <p>The response demonstrates minimal understanding of the prompt. The response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.</p>  |



Keaton's family has many plants inside their house and outside in their garden. Keaton sees that some plants grow faster and look healthier than others. This causes Keaton to wonder which factors affect plant growth. He decides to perform an investigation. He places three similar plants in similar pots on the same windowsill. However, he changes some of the conditions under which the plants will grow for the next seven days.

Keaton makes a poster showing the results after seven days.



6. Keaton uses the data from his investigation to identify the factors that help plants grow.

Which two factors help plants grow the most? Choose two.

- A air
- B soil
- C sunlight
- D water

**1 point for both correct factors**

### **Standards Alignment**

**Discipline: Life Science**

**NGSS Topic: Matter and Energy in Organisms and Ecosystems**

**DCI: LS1.C**

**Plants acquire their material for growth chiefly from air and water.**

**SEP4: Analyzing and interpreting data**

**No CCC**

**Achievement Level: Below State Expectations**