



Maine
Department of
Education

GRADE

8

Maine Science Assessment
Released Items (2025)
Teacher Version



New Meridian

Included in this document are items and their associated stimuli that were operationally administered on the Maine Science Assessment. 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. The number of points the item is worth is provided, as well as the answer key.

Use the information from Ice Roads to answer **questions 1–5**.

Ice Roads

Every winter, Mason enjoys visiting his cousin Clara in Bayfield, Wisconsin. He loves when they drive across frozen Lake Superior on an ice road to reach Madeline Island.



The ice road between Bayfield and Madeline Island in Lake Superior in 2015

This ice road is special to Mason because there is no ice road near his home in Torr Head, which is along the Irish Sea in Northern Ireland.



Bayfield, Wisconsin, is 14 km across Lake Superior from Madeline Island.



Torr Head, Northern Ireland, is 19 km across the Irish Sea from Mull of Kintyre.

But when Mason visited Bayfield last winter, there was less ice and no ice road. He wonders if there will ever be an ice road again.

1. Mason and Clara decide to design an investigation to learn more about the ice road and Lake Superior historically (in the past) and recently. They use trays with water of different temperatures to represent Lake Superior and place the trays inside containers with different air temperatures to represent the air above Lake Superior. Then these containers are both placed in a freezer for two hours to represent what happens in the winter.

Which investigation setup and predicted results would best represent historical conditions in Lake Superior, and which setup and predicted results would represent recent conditions in Lake Superior? Write the letter of the setup and predicted results into the table.

	Historical Lake Superior	Recent Lake Superior
Setup before placed in freezer	A <input type="checkbox"/>	B <input type="checkbox"/>
Predicted results	C <input type="checkbox"/>	D <input type="checkbox"/>

Setup:

- A. Cold water tray in cold container
- B. Warm water tray in warm container

Predicted Results:

- C. 90% ice after 2 hours
- D. 50% ice after 2 hours

1 point for whole table correct

Standards Alignment

Discipline: Earth and Space Science
 NGSS Topic: Weather and Climate

DCI: ESS2.C

The complex patterns of the changes and the movement of water in the atmosphere, determined by winds, landforms, and ocean temperatures and currents, are major determinants of local weather patterns.

SEP3: Planning and Carrying out Investigations

CCC7: Stability and Change

2. Mason wonders about temperatures in other locations and finds the information in the following table.

Year	Washington, D.C. (USA)	Los Angeles, California (USA)	Frankfurt, Germany	Seoul, South Korea
1975	4.4°C	15.3°C	8.3°C	3.3°C
1995	5.3°C	14.0°C	9.4°C	7.2°C
2015	10.3°C	16.6°C	10.5°C	11.1°C

Mason thinks this table shows a pattern of climate change. What evidence supports his claim?

- (A) Temperatures are not the same from city to city.
- (B) Temperatures in the cities represent only local variations in weather.
- (C) Temperatures in the cities are gradually increasing over time.
- (D) Temperatures have consistently decreased and then increased over time.

1 point

Standards Alignment

Discipline: Earth and Space Science
NGSS Topic: Weather and Climate

DCI: ESS2.D

Weather and climate are influenced by interactions involving Sunlight, the ocean, the atmosphere, ice, landforms, and living things. These interactions vary with latitude, altitude, and local and regional geography, all of which can affect oceanic and atmospheric flow patterns.

SEP4: Analyzing and Interpreting Data

CCC7: Stability and Change

3. Mason and Clara find the average temperatures for four different locations around the world. They record the temperatures for three different years.

Average Temperature in Different Global Locations in November				
Year	Washington, D.C. (USA)	Los Angeles, California (USA)	Frankfurt, Germany	Seoul, South Korea
1975	4.4°C	15.3°C	8.3°C	3.3°C
1995	5.3°C	14.0°C	9.4°C	7.2°C
2015	10.3°C	16.6°C	10.5°C	11.1°C

Part A

Which activity that is supported by evidence is the **most** relevant to causing these differences in global temperature? 1 point

- (A) Natural changes in local weather.
- (B) Natural changes in global climate.
- (C) People using gasoline-powered cars for transportation.
- (D) People using solar-powered heating and cooling systems.

Part B

Which question will **best** help Mason and Clara find additional evidence about how changes in temperature are related to human activities? 1 point

- (A) How many people live in urban areas today compared to 1975?
- (B) How many more cars are being driven in the world today compared to 1975?
- (C) How can people reduce their consumption of nonrenewable natural resources?
- (D) Do people now prefer solar-powered home heating and cooling systems compared to 1975?

See next page for standards alignment

Standards Alignment for item 3

Discipline: Earth and Space Science

NGSS Topic: Weather and Climate

DCI: ESS3.D Human activities, such as the release of greenhouse gases from burning fossil fuels, are major factors in the current rise in Earth's mean surface temperature (global warming). Reducing the level of climate change and reducing human vulnerability to whatever climate changes do occur depend on the understanding of climate science, engineering capabilities, and other kinds of knowledge, such as understanding of human behavior, and on applying that knowledge wisely in decisions and activities.

SEP1: Asking Questions and Defining Problems

CCC7: Stability and Change

4. Mason wishes Torr Head had ice and an ice road in winter. He looks at maps and notices that he and Clara both live on coasts very close to nearby islands or peninsulas. He wonders what other similarities and differences exist between their two locations and how these affect whether or not there is ice and ice roads. They make the following table comparing their locations.

Local Data for Bayfield, Wisconsin, and Torr Head, Northern Ireland					
	Average High Temp in Jan.	Average Low Temp in Jan.	Elevation	Latitude and Longitude	Population
Bayfield	21°F (-6.1°C)	3°F (-16.1°C)	271 m	47° N, 91° W	588 people
Torr Head	44°F (6.7°C)	37°F (2.8°C)	258 m	55° N, 6° W	150 people

As they try to understand why Torr Head winters are different than Bayfield winters, what part of this table is **most likely** to surprise Mason and Clara?

- A Torr Head is farther north than Bayfield.
- B Torr Head has fewer people than Bayfield.
- C Torr Head and Bayfield have similar elevations.
- D Torr Head and Bayfield are both on an eastern coast.

1 point

Standards Alignment

Discipline: Earth and Space Science

NGSS Topic: Weather and Climate

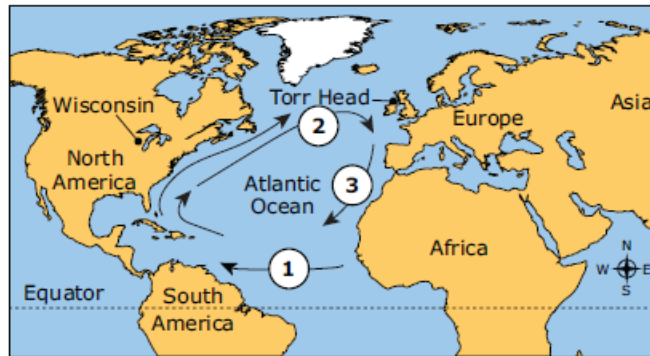
DCI: ESS2.D

Weather and climate are influenced by interactions involving Sunlight, the ocean, the atmosphere, ice, landforms, and living things. These interactions vary with latitude, altitude, and local and regional geography, all of which can affect oceanic and atmospheric flow patterns.

SEP4: Analyzing and Interpreting Data

CCC: Patterns

5. Mason and Clara realize Torr Head is near the ocean and wonder if surface ocean currents have something to do with the differences between Bayfield and Torr Head.



Part A

What are the water current temperatures at the different locations on the map above? Write the letter of the labels into the table below to select water temperatures and the reasoning for each selection.

Location	Water Temperature	Reasoning
1	A <input type="checkbox"/>	D <input type="checkbox"/>
2	A <input type="checkbox"/>	E <input type="checkbox"/>
3	B <input type="checkbox"/>	C <input type="checkbox"/>

1 point for table correct

Water Temperature:

- A. Warm current
- B. Cool current

Reasoning:

- C. Water is moving towards the equator.
- D. More direct sunlight warms water.
- E. Water is moving away from the equator.

Part B

The ocean current that travels toward Torr Head cools.

Why does the ocean water cool?

1 point

- (A) Energy disappears.
- (B) Energy becomes light.
- (C) Energy becomes water.
- (D) Energy is redistributed.

See next page for standards alignment

Standards Alignment for item 5

Discipline: Earth and Space Science

NGSS Topic: Weather and Climate

DCI: ESS2.D

The ocean exerts a major influence on weather and climate by absorbing energy from the Sun, releasing it over time, and globally redistributing it through ocean currents.

SEP2: Developing and Using Models

CCC5: Energy and Matter: Flows, Cycles, and Conservation