



Maine
Department of
Education

GRADE

8

Maine Science Assessment
Released Items (2024)
Teacher Version



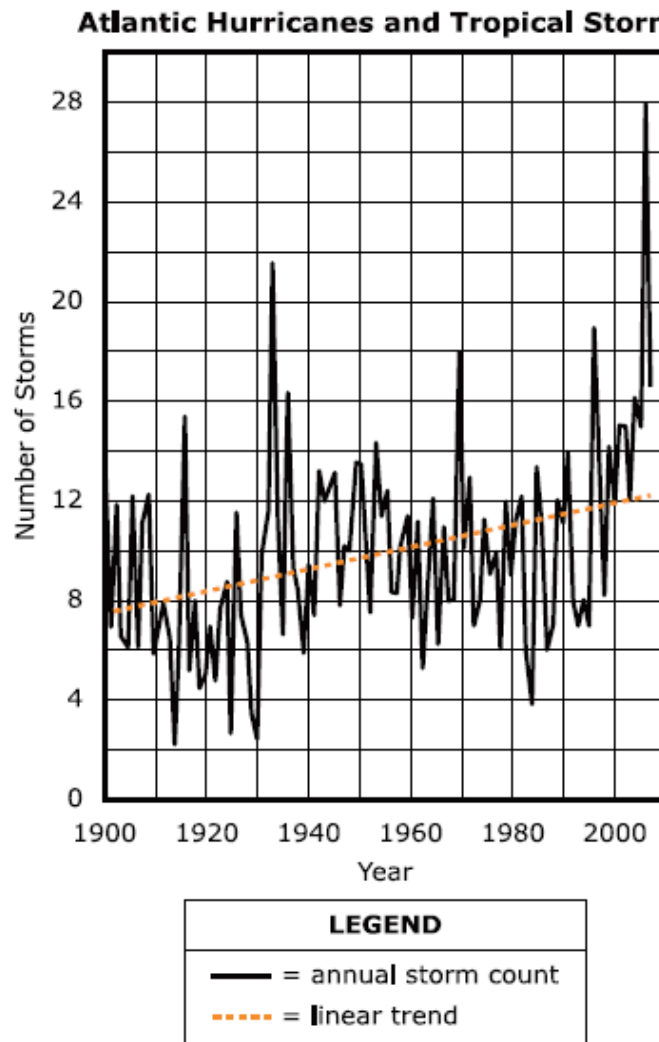
New Meridian

Included in this document are items and their associated stimuli that were 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 also provided, along with the correct answer.

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

Hurricanes

Courtney and Michael are in Miami, Florida, preparing their property for a hurricane. To protect their house from flooding, they place sandbags around the doors and board up the windows. Michael states that this is the most in any given year they have needed to prepare their property for hurricanes. They discuss Michael's observation and wonder if the increase in the number of hurricanes each year is related to global warming. They look for data and find this graph.



They discuss Michael's observation and wonder if the increase in the number of hurricanes each year is related to global warming.

1. There were 20 named hurricanes in 1933, which set the record for the most named storms in a season. Is this fact evidence against the increase of hurricanes associated with global warming? Write the letters for Yes or No and **one** reasoning statement in the table.

Is this evidence?	Reasoning Statement
B	C

Is this evidence?

A. Yes

B. No

1 point for both boxes correct

Reasoning Statements

C. The data indicates that this particular year is an outlier.
D. The data indicates that the pattern of hurricanes cycles every 40 years.
E. The data indicates that all the data points are within an expected range.
F. The data indicates that the number of hurricanes is random in any given year.

Standards Alignment

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.

SEP4: Analyzing and Interpreting Data

CCC1: Patterns

2. Courtney and Michael think that storms lower temperatures and that the average temperature for the area would become cooler if there were more storms. They investigate global warming to clarify their understanding and find that weather is different than climate.

What is the difference between weather and climate? Write your response in the space provided below.

See next page for rubric.

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DCI: ESS3.D

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SEP6: Constructing Explanations and Designing Solutions

CCC: None

Hurricanes Rubric

	Qualities of the Student Response
2	<p>The response must identify specific differences between weather and climate.</p> <p>The response must clearly state that weather describes short term conditions for a particular place (e.g., weather for today or weather for the week) and climate describes the variation of weather for the region during a longer interval (e.g., Winters in the Sierra Nevadas are generally cold and snowy, Hawaii is a hot and humid place.)</p> <p>Example Student Response: Weather refers to the day-to-day temperature and conditions in a specific place and climate refers to the average temperatures and conditions in a specific place over a longer period of time, such as years.</p> <p>Note: A 2pt response may not include any errors or flawed logic.</p>
1	<p>The response demonstrates a partial understanding of the prompt. The response must include a description of weather, climate, OR a general difference.</p> <p>Weather: Weather is the atmospheric conditions in a particular place at a particular time. Usually refers to temperature and type of precipitation for the day or week in a specific location (e.g., The weather for today in Portland, ME is high of 74, low of 65, scattered rain.) It can also include amount of cloud cover, amount of precipitation, type of storms, etc.</p> <p>Climate: Climate is the average conditions at a particular place during a longer given time. Climate is generally the average temperature, humidity, precipitation, sunshine, etc. over a long period of time, such as averages of several years, multiple decades.</p> <p>Difference Amount of time: States that there is a difference of time, but does not show understanding that climate refers to longer period of time (years) vs weather referring to shorter period of time (days, weeks).</p>
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>

3. Courtney and Michael look at the data for 1990–2006.
Which factor may be a contributing cause for the increasing number of storms between 1990–2006?
- (A) increased salinity of the ocean
 - (B) increased length of hurricane seasons
 - (C) increased strength of the Coriolis effect
 - (D) increased thermal energy in the atmosphere

1 point

Standards Alignment

Discipline: Earth and Space Science

NGSS Topic: Weather and Climate

DCI: ESS3.D

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SEP6: Constructing Explanations and Designing Solutions

CCC1: Patterns

4. Courtney and Michael understand that a storm's energy originates from the Sun.
Since there are increased number of storms, where does the additional energy come from?
- (A) the increased energy output of the Sun
 - (B) the increased kinetic energy of the ocean tides
 - (C) thermal energy of Earth's core being released at a faster rate
 - (D) more retained energy in Earth's atmosphere due to human activities

1 point

Standards Alignment

Same as item 3 except the CCC is CCC2: Cause and Effect

5. The table shows data generated from a simulation which models how gases interact with the amount of sunlight, and the sunlight's reflectivity off Earth's surface. The temperatures are that of Earth's atmosphere at the beginning and end of the simulation.

Trial 10 Sec.	Amount of Sunlight	Reflectivity	Carbon Dioxide ppm	Methane ppm	Sulfur Dioxide ppm	Nitrogen Dioxide ppm	Starting Temperature °C	Ending Temperature °C
Starting	Medium	Medium	200	200	200	200	14	13.6
#1	Medium	Medium	300	200	200	200	14	15.7
#2	Medium	Medium	200	300	200	200	14	15.9
#3	Medium	Medium	200	200	300	200	14	12.3
#4	Medium	Medium	200	200	200	300	14	13.6
#5	Medium	Medium	400	200	200	200	14	17.5
#6	Medium	Medium	200	400	200	200	14	16.9

Using the data table, which gas(es) are contributing to the rise in atmospheric temperature? Select **all** that apply.

- A Methane
- B Sulfur dioxide
- C Carbon dioxide
- D Nitrogen dioxide

1 point

Standards Alignment

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.

SEP4: Analyzing and Interpreting Data

CCC2: Cause and Effect