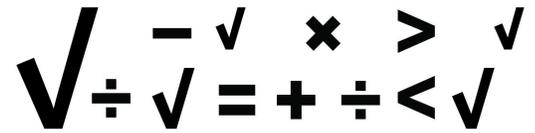


# 9-12 MATH

## PERFORMANCE TASK

### STUDENT INSTRUCTIONS



## TASK TITLE

The Perfect Storm (Name): Gale vs. Gail

## INTRODUCTION

Does the name of a hurricane indicate its strength? You will defend or refute the argument that *female named hurricanes are more dangerous* using a valid, well-constructed statistical argument. You will choose how to both creatively present and substantiate your claim.

## SCORING CRITERIA <sup>1 and 2</sup>

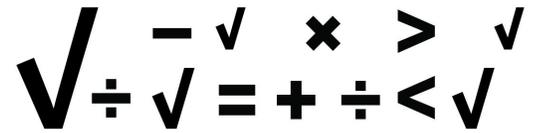
PERFORMANCE INDICATOR	BEGINNING	DEVELOPING	PROFICIENT	EXPANDING
<p>#6 Data, Statistics, and Probability: A</p> <p>Summarize, represent, and interpret data. (HS.S-ID.A, B, C)</p>	<p>Construct a representation of data and identify a distribution or pattern of the data.</p>	<p>Construct a representation of data, identify the distribution or pattern of the data, and communicate the meaning of the data.</p>	<p>Construct an appropriate representation of data, describe the distribution or pattern of the data, and communicate the meaning of the data.</p>	<p>Construct and use appropriate representation(s) of data to make predictions and justify conclusions.</p>
<p>#1 Mathematical Reasoning and Communication: B</p> <p>Select strategies and appropriate tools to develop and implement a plan to solve a problem. (MP1, 5)</p>	<p>Identify strategies and/or tools that could be used to solve a problem.</p>	<p>Select strategies and tools to solve a problem and apply initial strategies to attempt to solve a problem.</p>	<p>Design and implement a plan, including appropriate tools and strategies, to solve a problem.</p>	<p>Design, implement, and refine a plan including appropriate tools and strategies, to solve a problem.</p>



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<p>#1 Mathematical Reasoning and Communication: E</p> <p>Precisely communicate mathematical understandings and connections using a variety of representations. (MP1)</p>	<p>Communicate understanding using language and representations.</p>	<p>Communicate mathematical understanding and connections using mathematical language and representation(s).</p>	<p>Clearly and logically communicate mathematical understanding and connections using technical mathematical language and appropriate representation(s).</p>	<p>Enhance communication through the intentional sequencing and presentation of ideas and the strategic selection and use of representations.</p>
<p>Communication: 3</p> <p>Choose and apply an appropriate communication strategy according to audience and purpose.</p>	<p><b>Identify</b> audience and purpose of communication.</p> <p><b>Use</b> a method of communication (e.g., written, oral, visual, graphic, audio, and/or interactive) to present ideas.</p>	<p><b>Use some appropriate</b> aspects of style, tone and language to <b>partially address</b> the needs of the audience and purpose.</p> <p><b>Select and use</b> a method of communication (e.g., written, oral, visual, graphic, audio, and/or interactive) to present ideas.</p>	<p><b>Use appropriate style, tone, and language</b> to address intended audience and purpose.</p> <p><b>Select and use</b> a method of communication (e.g., written, oral, visual, graphic, audio, and/or interactive) that fits the audience and purpose.</p>	<p><b>Use strategic, engaging, and creative</b> style, tone, and language to effectively address the intended audience and purpose.</p> <p><b>Select and use</b> a strategic method of communication (e.g., written, oral, visual, graphic, audio, and/or interactive) that effectively addresses the audience and purpose.</p>

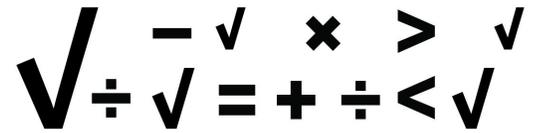
<sup>1</sup> The scoring team did not use the cross curricular scoring criteria *Communication (3. Choose and apply an appropriate communication strategy according to audience and purpose)* during their calibration session since they did not witness the student presentations.

When scoring they considered the other criteria in this order:

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- #1 Mathematical Reasoning and Communication: B
- #1 Mathematical Reasoning and Communication: E
- #6 Data, Statistics, and Probability: A

**2** Modifications were made to the Scoring Criteria after the task was administered. These modifications were based on those made to the Performance Indicators. The modified versions are shown below.

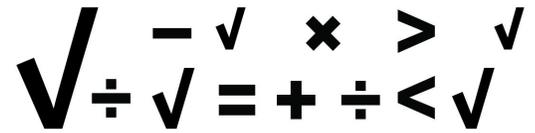
If the decision is made to use this task, we advise using the modified Scoring Criteria. This may require the user to make adaptations to the task before administering it to students.

PERFORMANCE INDICATOR	BEGINNING	DEVELOPING	PROFICIENT	EXPANDING
#1 Mathematical Reasoning and Communication: B  Select strategies and appropriate tools to develop and implement a plan to solve problems. (MP1, 5)	Identify strategies and/or tools that could be used to solve problems.	Select strategies and tools to solve a problem and apply initial strategies to attempt to solve problems.	Select strategies and appropriate tools to develop and implement a plan to solve problems.	Design, implement, and refine a plan including appropriate tools and strategies, to solve problems.
#1E Precisely communicate mathematical understandings and connections using a variety of representations. (MP1, 3, 6)	Communicate understandings or connections using at least one representation.	Communicate understandings and connections using appropriate representation(s).	Precisely communicate mathematical understandings and connections using a variety of representations.	Precisely communicate mathematical understandings and connections in an organized way using appropriate mathematical language and a

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## PERFORMANCE TASK

### STUDENT INSTRUCTIONS



				variety of representations.
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## STUDENT DIRECTIONS AND MATERIALS

### TASK DIRECTIONS<sup>3</sup>

Does the name of a hurricane indicate its strength? You will be presented with a set of data, in its original form, comprised of both male and female named United States hurricanes from the years 1950-2012. You will determine an appropriate method to organize the data, graph the data, describe the data, and eventually interpret the data. Based upon your findings, you will defend or refute the argument that female named hurricanes are more powerful using a valid, well-constructed statistical argument. You will choose both how to creatively present and substantiate your claim through the creation of a personal choice artifact or product. Throughout the entire project, self reflection is a crucial component. *Note: "Powerful" in this context is measured by the number of fatalities.*

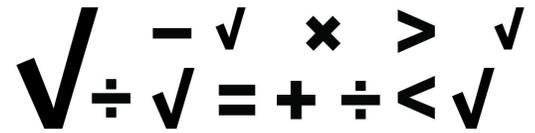
1. Inspect the [hurricane data](#) provided and make a plan to analyze if the name (by gender) has any association with the severity of the hurricane (severity as measured by the number of fatalities).
2. Organize the data, create a graph, and perform calculations to support your claim that the name does or does not have an association with the severity of the storms shown (severity as measured by the number of fatalities).
3. Self-reflect on your process and products using the [Student self-assessment](#) form. Make adjustments as needed.
4. Choose a final product form to defend your claim. Provide a rationale for your choice. Create and present it!
5. Reflect on your learning.

<sup>3</sup>The team felt it is important that students should be responsible for digitizing their final products. There should be a specific effort for developing a protocol or executable way that teachers can have their students put their work in one

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### STUDENT INSTRUCTIONS



location. This will facilitate the scoring process and eventual analysis. Guidance and additional scaffolds for some students should be considered.

#### MATERIALS

- [Hurricane Data Sheet](#)
- [4 Quadrant Math Problem](#) planning sheet
- [Student self-assessment](#) form
- Colored pencils and paper
- Graph paper( if desired)
- Optional technology (graphing calculator/spreadsheet program if applicable, Minitab, or MS Excel)
- Access to resources to create chosen type of project (youTube, news production, movie production software/app, etc.)
- Lined paper
- Small whiteboard (optional)

#### NOTE

#### CHECKLIST

Your product must include:

- Student planning sheet
- Self-assessment sheet
- Representation of the data
- Supporting calculations
- Written summary of your claim
- Final presentation product
- Reflection

## STUDENT REFLECTION AND/OR GOAL SETTING

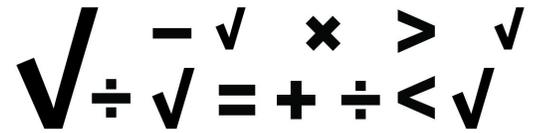
Now that you have completed your task, take some time to reflect on your learning by completing an exit ticket comprised of the following questions:

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## PERFORMANCE TASK

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1. What was the most valuable statistical measure to defend your claim? Why?
2. How could you have improved your final product?
3. Did the results of your project match with your initial predictions?
4. What strategies did you use to analyze the data and communicate your findings? Which strategies were most effective? Why?
5. What challenges did you encounter in working on this problem? How did you address or overcome those challenges?
6. Why did you select the form of the final product that you did? How could you have improved your final product?

#### Possible Extensions:

What does the research say about your claim? Is it in agreement with your results?

Upon completion of this project, you may choose to participate in a community service project where you design and carry out a project to aid victims of a hurricane or other natural disaster.

Gather data from hurricanes from 2013-present. Does your claim hold true? Statistically justify your response. [How Are Hurricanes Named?](#) may be a helpful resource.