

## **ENSO Research Report**

The ENSO Research Report is designed to demonstrate a working knowledge and understanding of the formation of El Niño and La Niña and their impacts on weather, climate, environment, and economies. Students will utilize information gathered from the Internet to predict possible occurrences of El Niño and La Niña in the future.

The ENSO Research Report consists of the following –

- Student Directions
- Information Collection Chart
- Extension Questions
- Rubric

This collection of materials can be used in part or as a whole. Modification may be made depending on level of student achievement. This project may be completed individually or in groups.

To allow students a better understanding of what is expected, teachers may choose to copy the rubric on the back of the Student Direction paper.

Suggested Websites:

<http://www.elnino.noaa.gov/>

<http://www.pmel.noaa.gov/tao/elnino/nino-home.html>

<http://earthobservatory.nasa.gov/Features/ElNino/elnino2.php>

<http://elnino.wr.usgs.gov/>

### **Georgia Performance Standards**

SM5. Students will differentiate the climates of Earth, how climate changes through time, and the theories regarding current climate change.

c. Evaluate the effects of El Nino-Southern Oscillation (ENSO) and the North Atlantic Oscillation (NAO) on climate.

d. Analyze current methods of climate prediction. (Predictions of ENSO, NAO, long-range outlooks, etc.)

Name \_\_\_\_\_

Class \_\_\_\_\_

**ENSO Research Report**  
**Student Directions**

Using the Internet, you are to research information pertaining to the El Nino Southern Oscillation phenomenon. Internet site suggestions are located below. Be certain to note which websites you take information from as you will create a bibliography.

Once your research is complete, you will compose a document that includes the following information –

- Conditions that produce El Niño and La Niña.
- Effects on weather, environment, and economies of areas surrounding the Pacific Ocean
- Correlation between El Niño and La Niña with the Earth's rotation and the Coriolis Effect
- Historic data
- Predictions on climatic effects

To complement the text, you will create either –

- PowerPoint Presentation of at least 6 slides (need to include at least 6 graphics/pictures/charts)
- Poster/ 3 Panel Poster of at least 6 graphics/pictures/charts with supporting textual documentation

To document the text, you will create a bibliography. See teacher for desired format.

To evaluate the work, a rubric has been developed. See teacher for copy.

**Georgia Performance Standards**

SM5. Students will differentiate the climates of Earth, how climate changes through time, and the theories regarding current climate change.

c. Evaluate the effects of El Nino-Southern Oscillation (ENSO) and the North Atlantic Oscillation (NAO) on climate.

d. Analyze current methods of climate prediction. (Predictions of ENSO, NAO, long-range outlooks, etc.)

## ENSO Information Collection

	El Niño Years	“Normal” Years	La Niña Years
Conditions in immediate area			
Environmental effects in immediate area			
Weather effects in immediate area			
Conditions in region			
Environmental effects in region			
Weather effects in region			
Economical effects in region			
Effects in North America			
Effects in Asia			
Effects in Australia			
Effects on North Atlantic hurricane activity			
Effects on Pacific cyclone/typhoon activity			

## Extension Questions

El Niño and La Niña occur only in the Pacific. Explain in detail why this is so.

How does the occurrence of El Niño and La Niña affect the formation of hurricanes in the Atlantic Ocean?

How does El Niño and La Niña correlate with the Earth's rotation? the Coriolis Effect?

Which state (El Niño, La Niña, "normal") are we currently experiencing? Explain your answer.

Research the dates of the most recent El Niño, La Niña, and "normal" episodes and write them below. A few have been filled in.

El Niño	"normal"	La Niña
2009-2010		
	2001-2002	
		1988-1989

Based on this information, which state do you expect in 2 years? Explain.

Based on this information, which state do you expect in 5 years? Explain.

Based on this information, which state do you expect in 10 years? Explain.

Describe the climatic history behind El Niño and La Niña.

Describe the most well known El Niño year and explain its notoriety.

How accurate are scientists able to predict the time and severity of El Niño or La Niña? Describe.

Explain if there will ever be a time to accurately predict the exact nature and affects of an El Niño or La Niña on future climates. Clarify.

Suggested Websites:

<http://www.elnino.noaa.gov/>

<http://www.pmel.noaa.gov/tao/elnino/nino-home.html>

<http://earthobservatory.nasa.gov/Features/ElNino/elnino2.php>

<http://elnino.wr.usgs.gov/>

# Research Report : ENSO

Student Name: \_\_\_\_\_

Date: \_\_\_\_\_ Class: \_\_\_\_\_

CATEGORY	4	3	2	1
<b>Research Paper - Quality of Information</b>	Information clearly relates to the main topic. It includes several supporting details and/or examples.	Information clearly relates to the main topic. It provides 1-2 supporting details and/or examples.	Information clearly relates to the main topic. No details and/or examples are given.	Information has little or nothing to do with the main topic.
<b>Research Paper - Amount of Information</b>	All topics are addressed and all questions answered with at least 2 sentences about each.	All topics are addressed and most questions answered with at least 2 sentences about each.	All topics are addressed, and most questions answered with 1 sentence about each.	One or more topics were not addressed.
<b>Research Paper - Sources</b>	All sources (information and graphics) are accurately documented in the desired format.	All sources (information and graphics) are accurately documented, but a few are not in the desired format.	All sources (information and graphics) are accurately documented, but many are not in the desired format.	Some sources are not accurately documented.
<b>PowerPoint/Poster - Mechanics</b>	No grammatical, spelling or punctuation errors.	Almost no grammatical, spelling or punctuation errors	A few grammatical spelling, or punctuation errors.	Many grammatical, spelling, or punctuation errors.
<b>Research Paper - Internet Use</b>	Successfully uses suggested internet links to find information and navigates within these sites easily without assistance.	Usually able to use suggested internet links to find information and navigates within these sites easily without assistance.	Occasionally able to use suggested internet links to find information and navigates within these sites easily without assistance.	Needs assistance or supervision to use suggested internet links and/or to navigate within these sites.
<b>PowerPoint/Poster - Content</b>	Diagrams and illustrations are neat, accurate and add to the reader's understanding of the topic.	Diagrams and illustrations are accurate and add to the reader's understanding of the topic.	Diagrams and illustrations are neat and accurate and sometimes add to the reader's understanding of the topic.	Diagrams and illustrations are not accurate OR do not add to the reader's understanding of the topic.
<b>PowerPoint/Poster - Mechanics</b>	No grammatical, spelling or punctuation errors.	Almost no grammatical, spelling or punctuation errors	A few grammatical spelling, or punctuation errors.	Many grammatical, spelling, or punctuation errors.
<b>PowerPoint/Poster - Organization and Neatness</b>	Information is very organized and neatly arranged; fonts/lettering are appealing and legible; decorations are quite tasteful and relate to topic	Information is organized and neatly arranged; fonts/lettering are appealing and legible; decorations are tasteful and relate to topic	Information is somewhat organized and somewhat arranged; fonts/lettering are fairly appealing and legible; decorations are tasteful and relate to topic	Information is very unorganized and is not neatly arranged; fonts/lettering are not appealing and not legible; decorations are not tasteful and do not relate to topic

Points \_\_\_\_\_ out of \_\_\_\_\_ GRADE \_\_\_\_\_ %

Comments \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_