

Investigation: How does sea surface temperature change with latitude?**INTRODUCTION:**

The following table shows Advanced High Resolution Radiometer (AVHRR) satellite Sea Surface Temperature (SST) measurements taken in July 1997 for several different latitudes along 135° West Longitude, in the Pacific Ocean.

DATA:**Sea Surface Temperature at 135° West**

<u>Latitude</u>	<u>SST</u>
50 ° South	10.9 °C
40 ° South	12.4 °C
30 ° South	18.9 °C
20 ° South	25.5 °C
10 ° South	27.4 °C
0 ° (the equator)	28.8 °C
10 ° North	27.9 °C
20 ° North	23.4 °C
30 ° North	21.6 °C
40 ° North	16.8 °C
50 ° North	12.9 °C

PROCEDURES:

Make a line graph of the data using a full sheet of graph paper. Calibrate the y-axis “SST in Degrees Celsius,” running from 0°C up to 35°C. Calibrate the x-axis “Degrees of Latitude,” from 90°S to 90°N (don’t forget the 0° point in the middle, representing the Equator).

ANALYSIS:

A. Describe the general shape of your graph.

B. Summarize the meaning of the graph in your own words.

C. a. What is the *actual* range of SST’s in the southern hemisphere (from 0° to 50°S)? b. Calculate the *actual* average rate of SST change per 10° of latitude.

D. Extrapolate both ends of your graph to meet the north and south poles, 90°N to 90°S. Fill in the *predicted* SST’s for the following latitudes:

- | | |
|----------|----------|
| a. 60° S | e. 60° N |
| b. 70° S | f. 70° N |
| c. 80° S | g. 80° N |
| d. 90° S | h. 90° N |

E. a. What is the *predicted* range of SST’s in the southern hemisphere (from 0° to 90°S) ? b. Calculate the *predicted* average rate of SST change per 10° of latitude.

F. How do your calculations for the actual and predicted rates of SST change per 10° of latitude compare?

G. San Francisco is at 38°N, and San Diego is at 32°N latitude. If the SST at San Diego was 20°C, predict the SST for San Francisco. Show your work. Did you use your actual or predicted rate of SST change? Why?

CREDITS:

Adapted from “Physical Oceanography from Space,” JPL-PODAAC, <http://podaac-www.jpl.nasa.gov/kids/index.html>

TEACHER'S GUIDE

SST v Latitude (@ 135N)

