

FORMAL ASSESSMENT

Seasonal Swings

Each activity in the Estuaries 101 Middle School Curriculum is designed around specific performance tasks. A generalized set of scoring rubrics is provided to judge student progress against these performance tasks.

Distribute the attached Student Assessment handout. Use the performance assessment indicators in the table below along with the suggested answers in order to arrive at a score for each performance task.

Performance Tasks	Performance Assessment Indicators		
	Low - Basic	Medium - Proficient	High- Advanced
The student integrated data (air temperature, water temperature, and latitude) from three locations to characterize estuaries in the National Estuarine Research Reserve System.	The response is partially correct. There is also evidence of inaccurate, incomplete, or inappropriate skills or knowledge.	The response is correct, and demonstrates accurate understanding of concepts. Minor inaccuracies may appear but there is no evidence of misconceptions.	Evidence of higher-level thinking and the application of the appropriate skills and prior knowledge. The response is correct and complete, and contains elaboration and extension. There is no evidence of misconceptions. Minor inaccuracies should not necessarily lower the score.
The student identified trends by comparing data for two reserves, one that experiences freezing winters and one that does not.			

Questions and Answers

- 1. Is the maximum air temperature recorded at each reserve at nearly the same latitude more or less similar to each other?**

The recorded temperatures are similar to one another. Students should see that air and water temperatures at the two Reserves located close to the same latitude are more similar to each other than either of them is to the third Reserve at a very different latitude.

- 2. The annual minimum air temperature for San Francisco and Chesapeake Bay differ by almost 17 points. What are other factors may influence air temperature besides latitude?**

Water temperature of the ocean or mountain ranges may impact the air temperature.

- 3. Is the maximum water temperature at each reserve at nearly the same latitude more or less similar to each other? Why or why not?**

No, there must be other factors that influence the temperature.

- 4. Which Reserve has the largest range of air temperature? Is that Reserve closer to the equator (i.e., lower latitude) than the other Reserves or farther away (i.e., higher latitude)?**

The Reserve with the largest range of air temperatures is likely to be the one located at the highest latitude (i.e., farthest from the equator).

Reflection Question

Estuaries have different geologic structures such as coastal plain, bar-shaped, or delta. What other factors make estuaries different from one another?

Estuaries can differ from each other because of the latitude they are located in, as well as such factors as air and water temperature.

STUDENT ASSESSMENT

Seasonal Swings

Your challenge is to compare and contrast air and water temperature at three estuaries to answer this question: “What factors can make one estuary different from another?”

Data: Air Temperature

	Reserve Name	Latitude	Annual Maximum Air Temp. (°C)	Annual Minimum Air Temp. (°C)	Annual Air Temp Range (°C)
Along the Same Latitude Line	San Francisco	38.19° N	40.0°C	-4.4°C	44.4°C
Along the Same Latitude Line	Chesapeake Bay	37.41° N	42.4°C	12.7°C	29.7°C
Different Latitude	Jobos Bay Puerto Rico	17.94° N	36.0°C	16.2°C	19.8°C

Data: Water Temperature

	Reserve Name	Latitude	Annual Maximum Water Temp.	Annual Minimum Water Temp.	Annual Water Temp Range °C
Along the Same Latitude Line	San Francisco	38.19° N	27.2°C	5.7°C	23.0°C
Along the Same Latitude Line	Chesapeake Bay	37.41° N	36.1°C	3.4°C	17.0°C
Different Latitude	Jobos Bay Puerto Rico	17.94° N	39.9°C	20.0°C	19.9°C

Questions

1. Is the maximum air temperature recorded for each reserve at nearly the same latitude more or less similar to each other?
2. The annual minimum air temperature for San Francisco and Chesapeake Bay differ by almost 17 points. What are other factors that may influence air temperature?
3. Is the maximum water temperature at each reserve at nearly the same latitude more or less similar to each other? Why or why not?
4. Which Reserve has the largest range of air temperature? Is that Reserve closer to the equator (i.e., lower latitude) than the other Reserves or farther away (i.e., higher latitude)?

Reflection Question

Estuaries have different geologic structures such as coastal plain, bar-shaped, or delta. What other factors make estuaries different from one another?