Where do the critters live?

Objective
Participants will determine where ocean critters might be based on ocean temperatures.

Correlations
National Science Education Standards
Grades 5-8: A, C
Grades 9-12: A, C

California State Science Education Standards
Grade 6: 5b, e, 6b
Grade 7: 2a, d, e, 7b
Grades 9-12: Life Sciences 6a-g, 7d

Ocean Literacy Principles and Fundamental Concepts

Introduction
Any aspect of the physical environment that affects living organisms is called a "physical factor". Aquatic organisms are greatly affected by various physical factors such as temperature, salinity, dissolved oxygen, depth, and several others. In the open coastal ocean, temperature can be a strong determinate of animal distribution. This is a web-based activity that uses ocean temperatures to understand where various ocean organisms could be found. Students are asked to answer a series of questions about the potential location of organisms. They will use links that provide water monitoring data for various locations. The real-time data will then be compared to the optimal temperature of each organism. From this comparison, students can determine the potential location of each organism.

Procedure
1. Study the table below containing the optimal temperature ranges for these ocean organisms.

Critter name	Critter optimal temperature (°C)	Potential Location
Kelp Bass	16-20	_____
California Halibut	10-25	_____
California Sheephead	10-26	_____
CA Spiny Lobster	8-14	_____

White Seabass	16-20	_____
Yellowtail	20-30	_____
Eelgrass	0-25	_____
Giant Kelp	15-20	_____

2. Go to the NOAA National Buoy Data Center website: http://www.ndbc.noaa.gov

3. Retrieve water temperatures at several offshore sites from Diablo Canyon, CA to Imperial Beach, CA and record below. Use the station ID codes to locate the buoys. Record your findings in the table below. Remember: (°F - 32) x 5/9 = °C

4. Match each organism in the table above with the locations listed below where they could be found living. Write the name of the corresponding location(s) next to each organism's name.

Location	**Temperature °C**
Diablo Canyon (46215)	_____
Goleta Point (46216)	_____
Los Angeles (OHBC1)	_____
Oceanside Offshore (46224)	_____
Imperial Beach (46235)	_____

Suggested questions

1. Which organisms would you expect to find off the coast of Los Angeles at this time?

2. Which organisms would you expect to find close to Diablo Canyon at this time?

3. Which organisms would you expect to find near Imperial Beach at this time?

4. Are there any organisms that might live anywhere from Diablo Canyon to Imperial Beach?

References

National Science Education Standards
http://www.nap.edu/openbook.php?record_id=4962

Temperature ranges for fish
http://www.saltwatersportsman.com/article.jsp?ID=21011164

Temperature for California Spiny Lobster
http://www.ingentaconnect.com/content/els/01657836/2003/00000065/00000001/art00239

Temperature range for Giant Kelp
http://sanctuaries.noaa.gov/about/ecosystems/kelpdesc.html

Temperature range and more information on eelgrass
http://www.city.newport-beach.ca.us/HBR/Eelgrass Update 8-03.pdf

Converting °F to °C and back
http://www.manuelsweb.com/temp.htm

$$(°F - 32) \times 5/9 = °C$$

$$°C \times 9/5 + 32 = °F$$