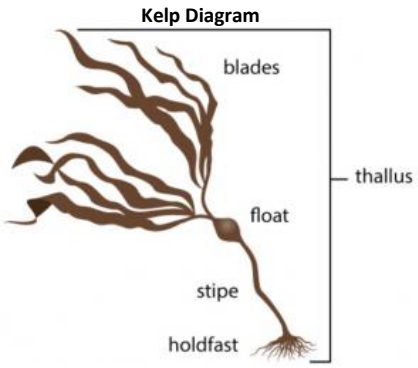
Science Bite
The Help with Kelp

Lauren Bell, UCSC researcher, just ended her kelp project this week. She began with 3 different types of algae - *Macrocystis pyrifera* (MP) and 2 different understory kelp including *Saccharina nigripes* (SN) . Each blade was trimmed to 10 cm measured from the holdfast to the stipe (see kelp diagram to the right). They were placed in containers that were controlled for temperature and pH. Her study is called a "factorial" study which means that algae was grown in 4 different conditions of current temperature and future temperature along with current pH and future pH. "Current" refers to 2020 values in Sitka Sound and "Future" refers to predicted 2100 values.



What are the 4 different conditions using combinations of temperatures and pH?
Use the table below to help identify the 4 combinations:

Conditions	Current temp: 7° C	Future temp: 11° C
Current pH: 7.8		
Future pH: 7.4		

The attached photos show 2 different types of algae (MP and SN) that were grown in current temperature and future temperature. She did not change the pH for these samples, all were grown in pH 7.8.

Using the photos provided, how much did the algae grow in 34 days?

MP current temp _____cm - 10 cm = _____cm
MP future temp _____cm - 10 cm = _____cm
SN current temp _____cm - 10 cm = _____cm
SN future temp _____cm - 10 cm = _____cm

What conclusions can you draw from this information?

How could Lauren test this hypothesis?

ANSWER KEY:

What are the 4 different conditions using combinations of temperatures and pH? The table below may help to identify the 4 combinations:

Conditions	Current temp: 7° C	Future temp: 11° C
Current pH: 7.8		
Future pH: 7.4		

ANSWER: current pH + current temperature, current pH + future temperature, future pH + current temperature, future pH + future temperature

The attached photos show 2 different types of algae (MP and SN) that were grown in current temperature and future temperature. She did not change the pH for these samples, all were grown in pH 7.8.

Using the photos provided, how much did the algae grow in 34 days?

ANSWERS:

MP current temp 18.3 cm - 10 cm = 8.3 cm
(23.0 - 3.7)

MP future temp 13.2 cm - 10 cm = 3.2 cm
(19.0 - 5.8)

SN current temp 19.8 cm - 10 cm = 9.8 cm
(24.8 - 5.0)

SN future temp 12.5 cm - 10 cm = 2.5 cm
(18.0 - 5.5)

What conclusions can you draw from this information?

Growth increases in colder temperature.

How could Lauren test this hypothesis?

Lauren could repeat her study with many more samples of current temperature (current pH) and future temperature (current pH) of just one type of algae to make sure that the trend stayed consistent.

She could conduct a study with colder temperatures than our current temperature.

Other ideas?