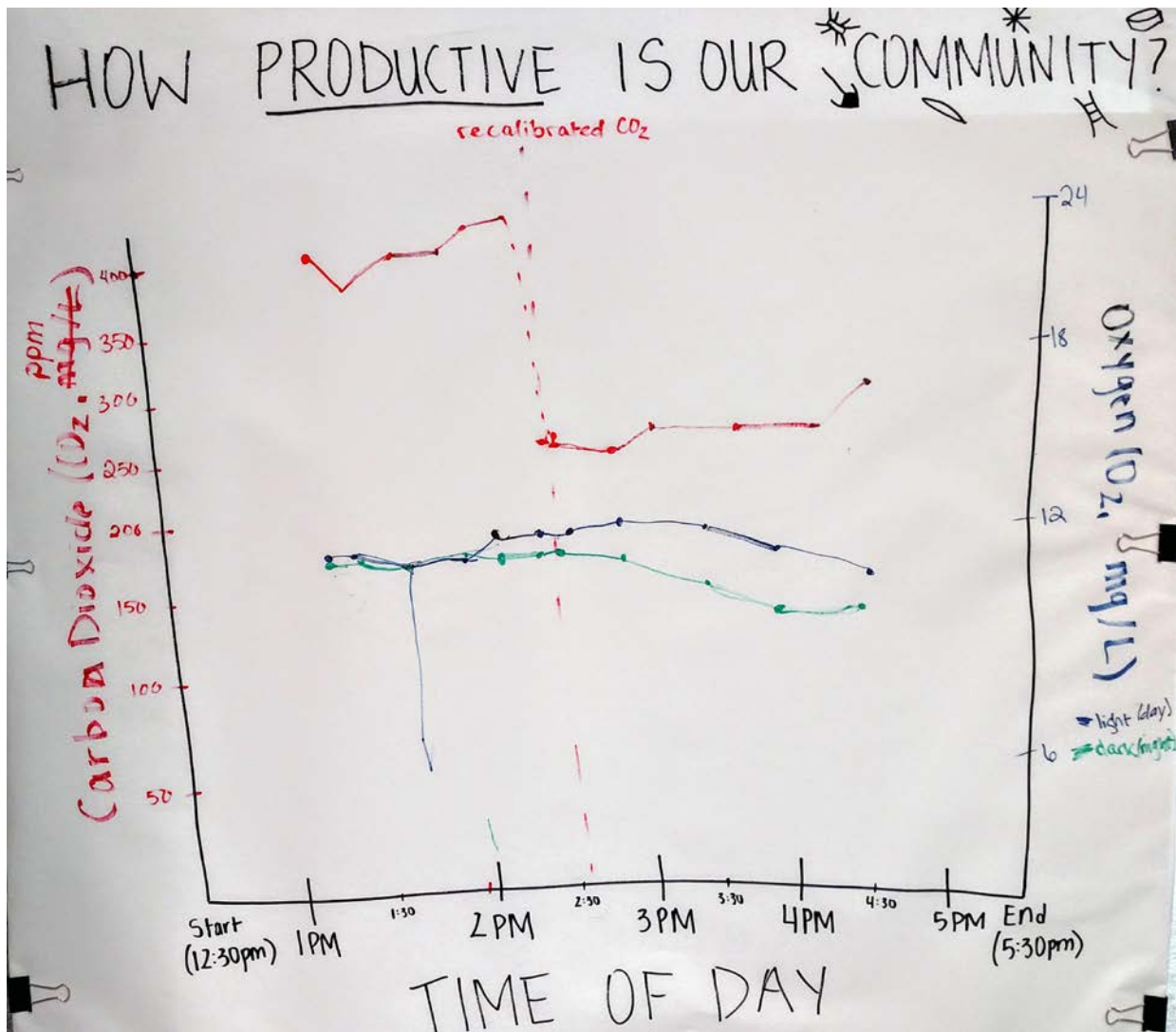


## How do microscopic algae change water chemistry?

Phytoplankton, or single-celled algae, consume carbon dioxide and release oxygen in the process of photosynthesis, in the presence of sunlight. In the dark, they respire, taking up oxygen and giving off carbon dioxide just as we do.



This plot shows the change in the amount of carbon dioxide (CO<sub>2</sub>) and oxygen (O<sub>2</sub>) in flasks filled with water containing phytoplankton, over the course of Discovery Day (4 hours). CO<sub>2</sub> was actually increasing over time and O<sub>2</sub> began to decrease over time, even in the daylight bottle. Both of these were unexpected results\*. O<sub>2</sub> in the dark bottle also decreased over time, but that was expected.

\*The unexpected results could be explained by the following: the CO<sub>2</sub> instrument had to be recalibrated midway through measurements; and scientists suspected that their plankton collections were too dense. When this happens, as in large plankton blooms in the ocean, there are not enough nutrients for all the plankton, and they start to die off. This actually consumes oxygen, leading to “dead zones” where no organisms can live. Malfunctioning equipment, sampling mistakes, and unexpected results are part of scientific research, which is why experiments are tested, refined and repeated until statistically significant results are obtained and then reviewed by other scientists before they are published and used by others. To see more typical results and more information on the role of phytoplankton in ocean chemistry from 2015 Discovery Day, click [here](#).