

Algae in A Bottle Teacher's Guide

Timing Considerations

This activity takes one day to set up, plus intermittent time for students to collect data, then time at the end to analyze the data and draw conclusions. Overall, the experiment takes about 2 weeks, but only one whole class period at the beginning, and one at the end.

There are few recommended options for timing:

- **Option 1:** Start the experiment right after Activity 1, and then check in with the results as time goes on. This has the benefit of helping students understand what they are setting up. However, students won't get results until later in the module.
- **Option 2:** Start the experiment in advance of the module so they will be able to draw conclusions by the time you get to this Activity. This has the advantage of providing results earlier, but students won't really understand why they are setting up the experiment.
- **Option 3:** Start one set of algae bottles in advance so that students can see the results earlier, then have them start their own experiments during the module. This way students can see results earlier, and also know why they are setting up the experiment. The downside to this is that students will know what happens in the experiment before their own bottles are done.

All three options have benefits and drawbacks. Choose the option that works best for you and your students.

Materials

Bottles: The experiment calls for 4 bottles or jars per group of students. The bottles should ideally be the same within a group, but they can be different for different groups. Consider having students bring in bottles or jars from home to use. If absolutely necessary, you can buy packs of water and use the bottles. The amounts for this experiment are based on 500ml bottles.

Fertilizers: The experiment calls for high nitrate and high phosphate fertilizers. You can find a variety of different fertilizers at local garden stores and online. For example, Amazon sells the two fertilizers below. You may be able to get a local garden store to donate them. Look for fertilizers that only have one of the two ingredients (nitrate or phosphate) to make the results more clear.

- Nitrogen fertilizer: Easy Peasy Plants Urea Nitrogen Fertilizer
- Phosphorus fertilizer: Easy Peasy Plants Triple Super Phosphate

Water: If you have nearby access to a pond or slow-moving stream that likely has algae in it, this is the easiest source. If you don't have access to either of these, you can likely get aquarium water from a local pet store that sells fish. You can also order blue-green algae from science suppliers such as Carolina. Make sure to get enough water for all your student groups.

Dissolved oxygen test kit: There are a variety of commercially available dissolved oxygen test kits that vary by price, accuracy, and ease of use. Generally speaking, the more accurate kits are more expensive, though not necessarily more difficult to use. Below are two suggested kits:

- Salifert [Dissolved Oxygen Test Kit](#) (less accurate, relatively easy, inexpensive)
- CHEMets [Dissolved Oxygen Visual Kit](#) (accurate, very easy, more expensive) – [refill kits are less expensive](#)