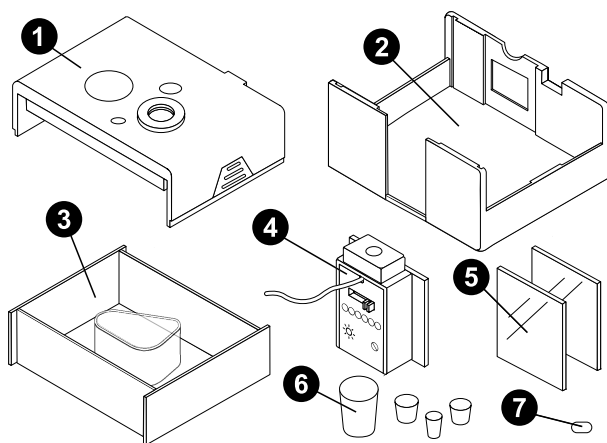# Photosynthesis Chamber
PS-3251

Introduction

The Photosynthesis Chamber allows you to study the behavior of an enclosed plant specimen during photosynthesis. The chamber includes both an inner chamber for holding the sample and an outer chamber for temperature control. The included LED light source can be set to emit red, green, blue, or white light. The LED light source and the included mirrors slot into the side openings of the chamber, ensuring that all emitted light remains in the chamber and that no external light can enter. The lid of the chamber features four holes which can hold various PASCO sensors, and which can be closed off with the included stoppers when not in use.

Components

Included equipment:

1. Chamber lid

2. Photosynthesis chamber

3. Transparent tank

4. LED light source with power supply

5. 2× mirrors

6. 4× stoppers

7. Bar magnet

8. Magnetic cross (not pictured)

Recommended equipment:

• Magnetic stirrer, such as the SE-7700

• PASCO Capstone or SPARKvue data collection software

• Wireless Temperature Sensor (PS-3201)

• Wireless Conductivity Sensor (PS-3210A)

• Wireless Optical Dissolved Oxygen Sensor (PS-3246)

• Any PASCO ion-selective electrode (ISE)

Get the software

You can use the chamber with SPARKvue or PASCO Capstone software. If you're not sure which to use, visit pasco.com/products/guides/software-comparison.

SPARKvue is available as a free app for Chromebook, iOS, and Android devices. We offer a free trial of SPARKvue and Capstone for Windows and Mac. To get the software, go to pasco.com/downloads or search for **SPARKvue** in your device's app store.

If you have installed the software previously, check that you have the latest update:

⊞ **SPARKvue:** Main Menu ▤ > Check for Updates

◆ **PASCO Capstone:** Help > Check for Updates

Setup

1. Place the transparent tank into the photosynthesis chamber.

2. Lower the chamber lid onto the photosynthesis chamber, as shown in Figure 1. The tab on the side of the lid ensures that the lid can only be inserted in a single orientation. Press inward on the lower portions of the lid and slide the lid down to secure it in place.
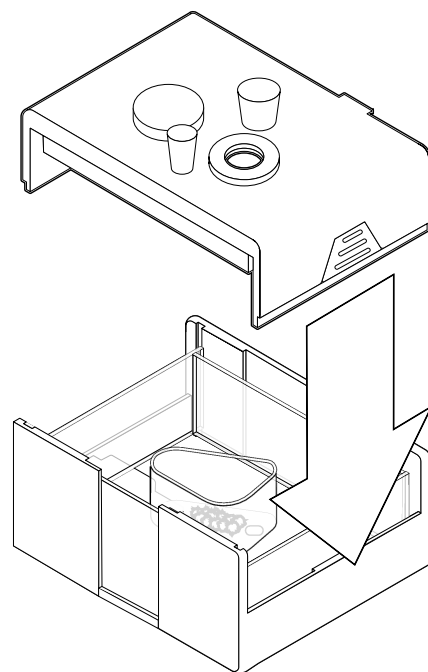

Figure 1. Secure the lid on top of the photosynthesis chamber.

⚠ **CAUTION:** When securing the lid, keep your fingers clear of the gap between the lid and the photosynthesis chamber! Failure to do so may result in your skin becoming pinched as the lid is lowered.

3. Insert one of the mirrors into the slot in the chamber with the smaller side opening. The mirrored side should face inward towards the chamber, as shown in Figure 2.

4. Insert the LED light source into the slot in the chamber with the larger side opening, as shown in Figure 2. To ensure that more of the light has a chance to be absorbed by the sample, align the light source so the threaded hole faces upwards.
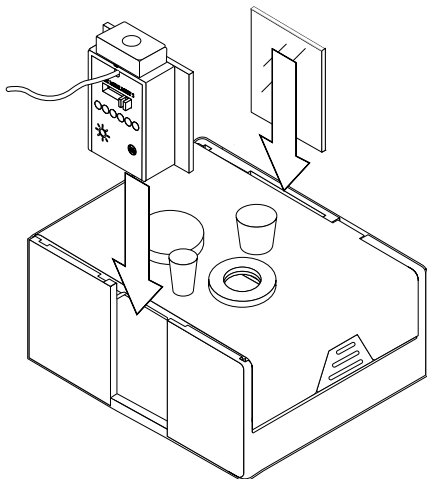

Figure 2. Insert the mirror and light.

5. Connect the LED light source to the provided power supply, then plug the power supply into a standard wall outlet.

6. *Optional:* For more consistent results, insert either the bar magnet or the magnetic cross into the inner chamber through one of the holes in the lid, then place the Photosynthesis Chamber onto a magnetic stirrer to be used during the experiment.

Sample procedure

The following steps outline a general sample procedure for measuring changes within a sample during photosynthesis.

> ✏ **NOTE:** Before using the Photosynthesis Chamber for the first time, make sure to wash the transparent tank, as well as the magnets (if you intend to use them).

1. Fill the outer chamber of the transparent tank with water or another liquid at the desired temperature for your sample. The fluid in this chamber will help control the sample's temperature during the experiment.

2. Place your chosen plant specimen, aquatic animal, or algal beads into the inner chamber, then fill the inner chamber with water.

3. Follow the equipment setup instructions listed under **Setup**.

4. Insert the probes of the appropriate sensors for your experiment into the properly-sized holes in the chamber lid. For experiments requiring minimal air exchange, ensure that the other holes in the lid are covered with stoppers.

5. Connect your chosen sensors to PASCO Capstone or SPARKvue, then set up the program to display readings of your chosen measurements. For more information on connecting the sensors and setting up an experiment, see the manuals for the sensors and the PASCO Capstone or SPARKvue online help.

6. Turn on the light by setting the switch to the desired color, then begin recording data in the program. Observe how your selected measurements change over time or in response to changes in conditions.

Software help

The SPARKvue and PASCO Capstone Help provide information on how to use this product with the software. You can access the help from within the software or online.

⊞ **SPARKvue**

Software: Main Menu > Help

Online: help.pasco.com/sparkvue

◆ **PASCO Capstone**

Software: Help > PASCO Capstone Help

Online: help.pasco.com/capstone

Experiment files

Download one of several student-ready activities from the PASCO Experiment Library. Experiments include editable student handouts and teacher notes. Visit pasco.com/freelabs/PS-3251.

Technical support

Need more help? Our knowledgeable and friendly Technical Support staff is ready to answer your questions or walk you through any issues.

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