

# ALGAE IDENTIFICATION

## DETECTION, FILTRATION & MICROSCOPY PROTOCOL

1. Click a picture of the fresh water body.
2. Report the appearance of the algae in the lake.
3. Report the odor of the water body.
4. Collect the water sample.
5. Report the color of the water sample collected.
6. Record the pH of the water sample collected.
7. Filter water sample.
8. Data upload on the website.

See algal sample under foldscope

<https://www.youtube.com/watch?v=IcAl5cRxj3A>

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### 1. Click a picture of the fresh water body

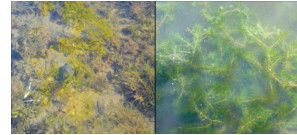
that you will monitor with your phone. Your Data point 1 will be a picture of the water body and later will be uploaded on the website. Example pictures :



### 2. Report the appearance of the algae in the lake.

Example

Rooted plants



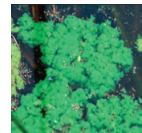
Soup/paint like



Floating plant like



Grass like



Filamentous algae



Other \_\_\_\_\_

### 3. Report the odor of the water body.

Neutral / No smell

Gasoline / Petrol like

Leafy

Septic

Musty or Rotting

Fishy

Other \_\_\_\_\_

### 4. Collect the water sample.

Collect water from the water body using a clean water bottle or disposable pipette to draw water out of the water body into your conical tube. If you feel that the algae is a really filamentous or rooted plant, floating or on rocks you can scrape and use your tweezer to pull out some and put it in the conical tube. Please do not touch algae with bare hands. Close the lid of the conical tube or water bottle and bring it back to your home or class.

### 5. Report the color of the water sample collected.

Take your conical tube with the water sample and look at it towards some light source (Do not look directly at the sun) and note down the closest color you see.

### 6. Record the pH of the water sample collected.

Dip pH paper in the water in the conical tube and record the pH with reference to the pH meter provided.

### 7. Filter water sample.

Take disposable pipette and to draw water out of the conical flask and pass it through the coarse filter attached to the other conical tube. The filtered water will be used to measure algal content with a spectrophotometer and leafy debris can be used to visualize algae under [Foldscope](#).

### 8. Data upload on the website.

All the images, videos acquired and observations noted will finally be uploaded on the website (details will be provided during sessions).

# MEASURING ALGAL BLOOM

## SPECTROPHOTOMETRY PROTOCOL

- Sample collection and filtration (as described in previous protocol).
- Spectrophotometer setup.
- Record algal content using a spectrophotometer.
- Data upload in the website on the website.

### 1. Sample collection and filtration.

Collect the sample as mentioned before and then filter out large leafy stuff and debris by transferring the content into another bottle using the metallic mesh provided in your kit. One can also use a sieve like a tea strainer.

### 2. Spectrophotometer setup.

It is best to set up the spectroscope indoors to maintain similar light conditions. Lay down a white sheet of paper on a flat surface and place the spectrophotometer on the top and mark the edges by a pen or pencil to make sure that spectrophotometer stays in that position throughout the course of measurements. Insert the phone upside down on the phone clips (shown in the image part 3) and make sure your phone's primary camera is aligned with the window for the camera (marked part 4 in the image). Open the color analyzer app on your cell phone.

### 3. Record algal content using a spectrophotometer.

(a) Fold the red color paper to make a tent (as in fig) and place it on the opposite side of the phone (shown in image). (b) Maximize Red value by moving the folded paper tent slowly towards or away from it. (c) Place an empty glass tube in the holder at the center of the spectroscope. Add 5 ml of the tap water (clean) in the tube with a reusable pipette. (d) Note R, G, B values for water and record it in the table. (e) Remove the test tube from the holder and keep it aside, this will be used again later. (f) Take another test tube in the holder and add 5 mls of the filtered sample. (g) Note R, G, B values for the sample as you did for the water. Remove the test tube with a sample and then keep it aside. (h) Repeat the above steps from (a) to (g), making the tent with Green and Blue papers.

### 4. Data upload on the website.

Write down all the R, G, B values in the table. This data will be uploaded later on the website (details will be provided during sessions).

| Sample name     | Paper color in front of instrument | R value | G value | B value |
|-----------------|------------------------------------|---------|---------|---------|
| Water only      | Red                                |         |         |         |
| Filtered sample | Red                                |         |         |         |
| Water only      | Green                              |         |         |         |
| Filtered sample | Green                              |         |         |         |
| Water only      | Blue                               |         |         |         |
| Filtered sample | Blue                               |         |         |         |

### How to set up the Carolina™ Spectroscopy Chamber

Item #653355

Watch the full video tutorial included with your purchase. See reverse side for details on how to access this valuable resource.

Download to your phone an RGB color analyzer app. Read the app's operating instructions online.



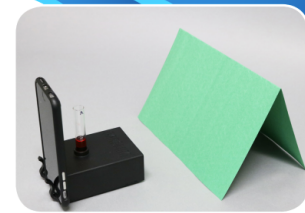
- Parts**
1. Test tube holder
  2. Alignment notch
  3. Clips for phone
  4. Window for camera



Select the complementary color of paper. Place it behind the chamber.

Calibrate with a blank before inserting test samples for transmittance readings.

**Additional materials needed:** Smartphone with RGB color analyzer app, test tubes (13 x 100 mm), construction paper (red, green, or blue), samples to be analyzed.



**CAROLINA™**  
www.carolina.com

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