Foldscope Activity - Exploring Seagrasses

LEADER'S GUIDE

Education is not the filling of a pail,
but the lighting of a fire.
- William Butler Yeats

Activity Description

Participants will explore seagrass samples. They will identify the different parts of a seagrass sample and observe the difference in cell structures.

Ages: 10+
Recommended Ratio: Variable, ideally 1 leader to 8-10 students
Time: approx 1 hour
Ocean Literacy Principles: 5 - The ocean supports a great diversity of life and ecosystems.

Materials

Foldscopes, slides and clear tape, seagrass(es), knife to cut samples, cutting surface, reference materials.

Optional Materials:
Light box for viewing, smart phone or tablet, additional references or internet for identification and information.

Options

- Seagrass samples can be brought into the classroom for participants to make slides.
- Participants can search for seagrass samples while walking on the beach.
- Slides can be pre-prepared if there is not enough time.

Risk Assessment

- Foldscopes should never be viewed looking into the sun or into direct, unfiltered light.
- Participants should be careful working with glass slides to avoid cuts.
- Caution should be used if knives are used to prepare samples.

LESSON STEPS	LEARNING OUTCOMES
1) The Leader should introduce seagrasses explaining what they are, their important role in the ecosystem, the causes of destruction of seagrass beds, and the names of the various parts of seagrasses and how to identify them.	Students should come away with a general knowledge about seagrasses such as that they are the only true plant to live entirely in the ocean, where they are found, their role in stabilising the seabed and absorbing CO_2, and their importance in providing food and habitat for many (local) species.
2) Ask students to examine their own seagrass specimens.	Students should be able to identify the various parts of their seagrass specimens and, if reference materials are available, the species.
3) The Leader should explain how to cut or scrape, if necessary, the parts of the seagrass, and how to fix a sample to the slide with clear tape or a plastic film cover.	Students should be able to prepare their own slides and view them. They should be encouraged to experiment with their methods to get the best results possible.
4) Students should work with the Foldscopes to correctly place the slides and focus on the samples. Depending on the thickness of their sample, they may need to vary the intensity of the light shining from behind/below the sample. They should draw on paper what they see through their Foldscopes.	Students should be able to draw what they view and indicate the presence and alignment of cell walls, the nuclei and or chloroplast, if visible, the difference between leaf and rhizome cells, etc. They should be encouraged to label their drawings and make notes.
Optional: If the Leader or students have smart phones or tablets, they can attach the magnet connector to their device and take photos of the samples.	Photos can be used for posts to www.microcosmos.foldscope.com, to share with classmates and family, and for other projects.

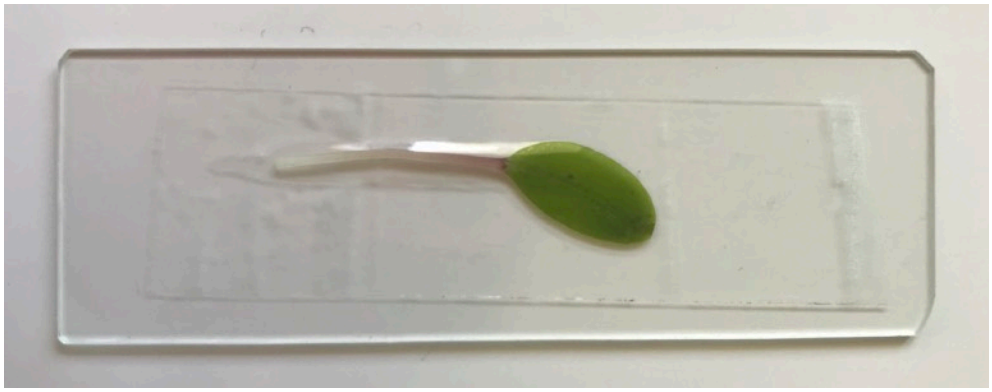
STEP 1

- Leaders are strongly encouraged to read the **free** "Seagrass Educators Handbook" (https://bit.ly/2GTJiR6)and *Module 2: Key Seagrass Species and How to Identify Them* from the "Seagrass Syllabus" (https://bit.ly/2Hy3Rjg) also available at www.seagrasswatch.org.

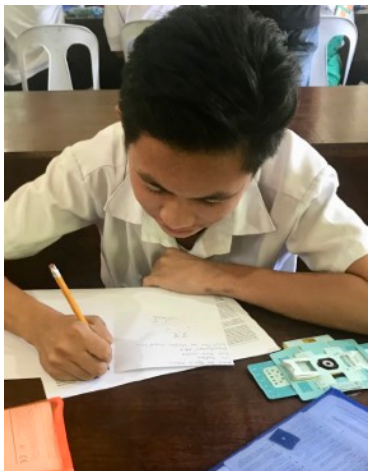
- We have made a 1-page handout for students for identification of seagrass parts with room for drawings available here: https://bit.ly/2IN2E7e

STEP 2 Examine specimens:

STEP 3 Students preparing slides with knives, cutting surface, tape, and slides:



STEP 4 Viewing and drawing:



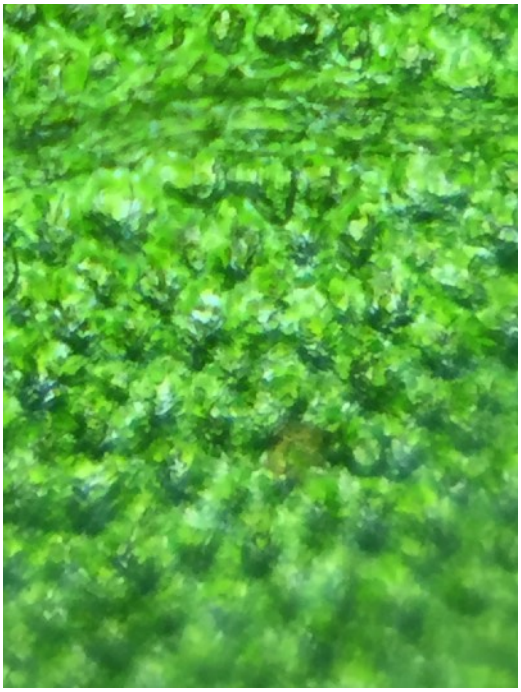
EXAMPLES

Photos taken with smart phone:

Foldscope lens only (x 140)

Halophilia sp.

Foldscope lens (x 140) plus x 5 zoom phone

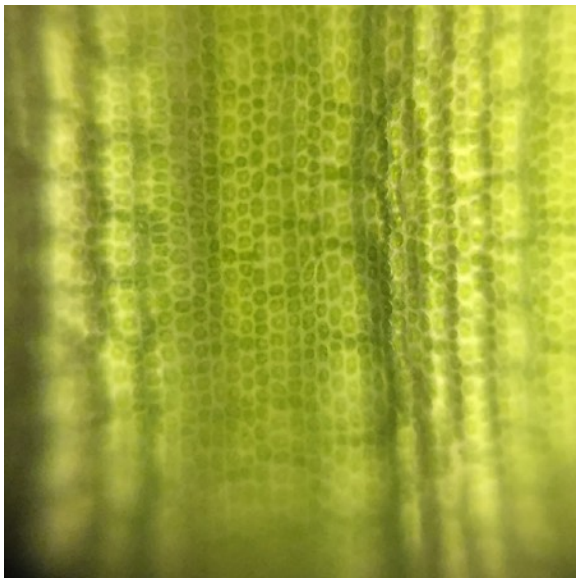


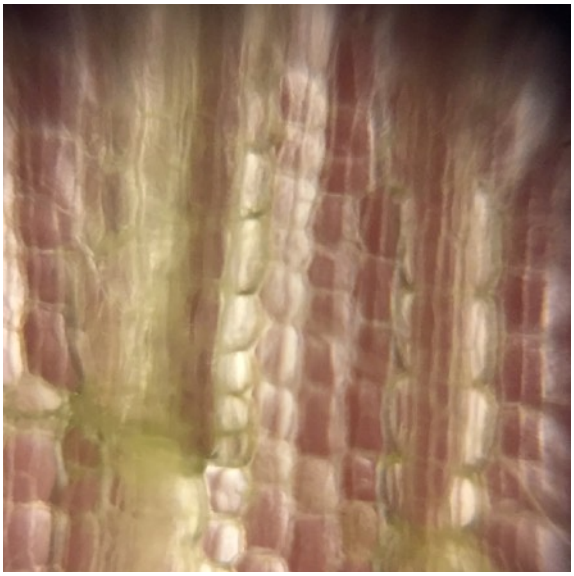
Halophilia sp.

Photos taken with smart phone, magnification unknown :

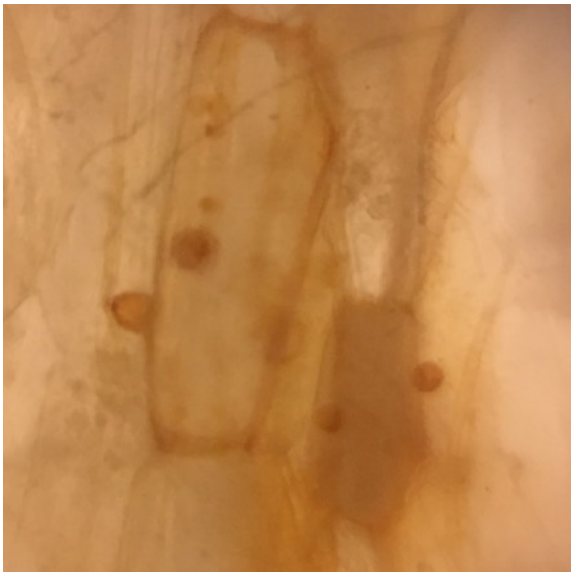
Halophilia sp.

Enhalus sp.





Enhalus sp. -white part of leaf



Rhizome of Enhalus sp.

ADDITIONAL ACTIVITIES

- Other seagrass activities for students can be found in the "Seagrass Activity Book for Secondary Students" (pdf document) available here https://bit.ly/2JI6OhF and at www.seagrasswatch.org .

- Check out www.microcosmos.foldscope.com for ideas for other Foldscope activities.

- A wide range of marine education and awareness resources for varying ages and different languages can be found on at www.bigbluenetwork.org .