

4: A Closer Look at Eelgrass, Seaweed, and Land Plants

Summary: Students observe the differences between simple algae, land plants, and eelgrass under the microscope.

Materials:

- eelgrass
- kelp, rockweed or other seaweed
- terrestrial flowering plant leaves.
- dissecting knives
- microscopes
- science journals

Background: Seagrasses are very different from seaweeds which also grow under water. The main difference is that seagrasses evolved from land plants and have specialized tissues, while seaweeds are algae: simply structured without specialized tissues. Seagrasses have true roots for extracting nutrients and minerals from the sediment (which are transported to the rest of the plant by xylem and phloem), but algae's hold fast is only used to anchor it to rock, and the whole plant can absorb nutrients by diffusion. Seagrasses' chloroplasts occur only in their leaves, but every cell of seaweed is capable of performing photosynthesis.

Seagrasses are also different from terrestrial angiosperms (flowering plants). Eelgrass leaves have no stomates (holes), which would weaken the plant under water. The interior of the leaves has regularly arranged air spaces, which help the leaves float up to reach more light. See what differences you can find with your students. Look at where the chloroplasts are located, and find differences in the reproductive structures. For a guide to terrestrial plant tissues: visit this site: <http://users.rcn.com/jkimball.ma.ultranet/BiologyPages/P/PlantTissues.html>.

Activity:

1. In their science journals or the following handouts, students draw the seaweed, eelgrass, and land plants, and label different structures they see.
2. Next they shave off thin pieces of different parts of the plants, and draw what they see in the microscope, making sure to label where each shaving came from on their drawings.
3. They shave off different layers of eelgrass leaves, labeling the chloroplasts in their drawings. They should notice that chloroplasts are only in the outer layer of the leaves, or epidermis in eelgrass, but they are in the inner part of the leaves of terrestrial angiosperms.

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A Closer Look at Eelgrass, Seaweed, and Land Plants

1. Observe the eelgrass, seaweed, and flowering land plant, and make simple sketches of the three plants in your science journal or in the space below, labeling the different structures you observe.

Write three differences for each plant that makes it different from the others.

Eelgrass: 1. _____
2. _____
3. _____

Seaweed: 1. _____
2. _____
3. _____

Land plant: 1. _____
2. _____
3. _____

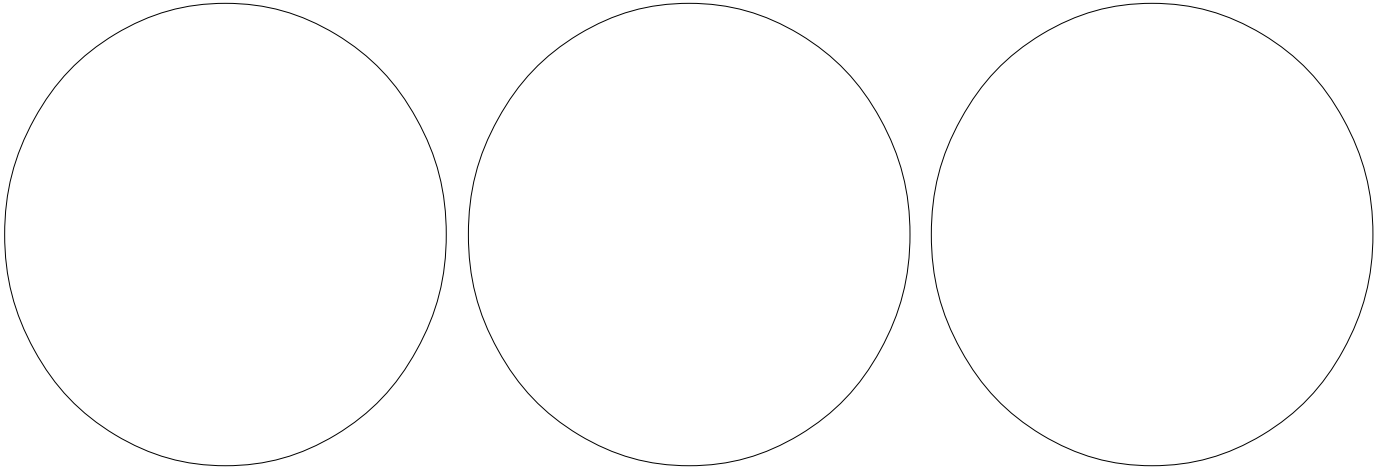
Next you will look at the plants under the microscope and discuss the differences you observe between them.



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Class: _____
Name: _____
Date: _____

Look at sliver of root or rootlike parts of each plant under the microscope and sketch what you see:



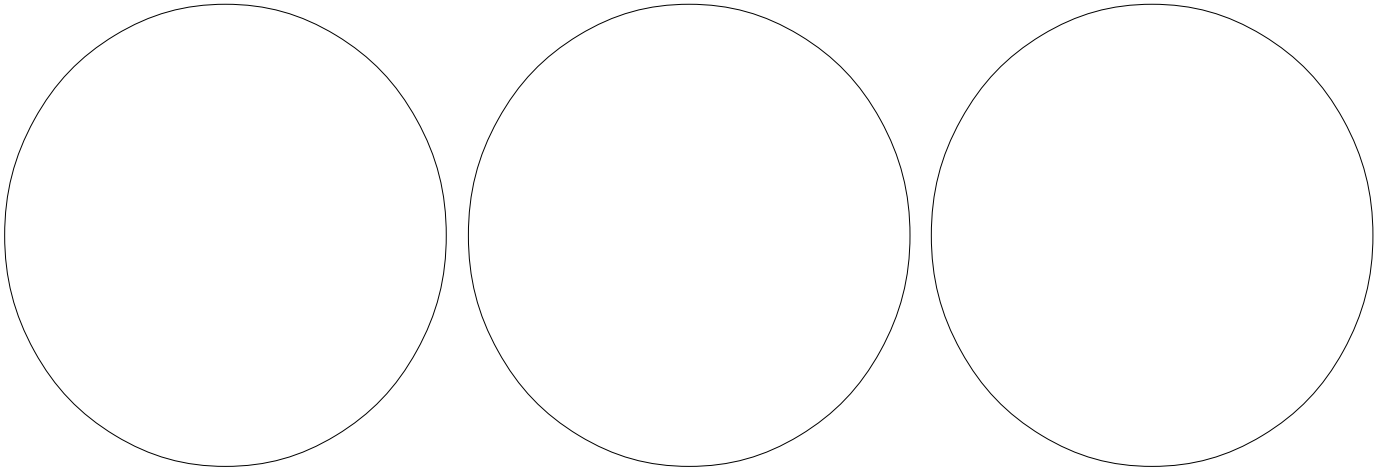
Plant: _____ Plant: _____ Plant: _____

Name three ways each is different from the others:

- | | | |
|----------|----------|----------|
| 1. _____ | 1. _____ | 1. _____ |
| 2. _____ | 2. _____ | 2. _____ |
| 3. _____ | 3. _____ | 3. _____ |

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Now look at a sliver of the outer layer of a leaf of each plant under the microscope and sketch what you see:



Plant: _____

Plant: _____

Plant: _____

Name three ways each is different from the others:

1. _____

1. _____

1. _____

2. _____

2. _____

2. _____

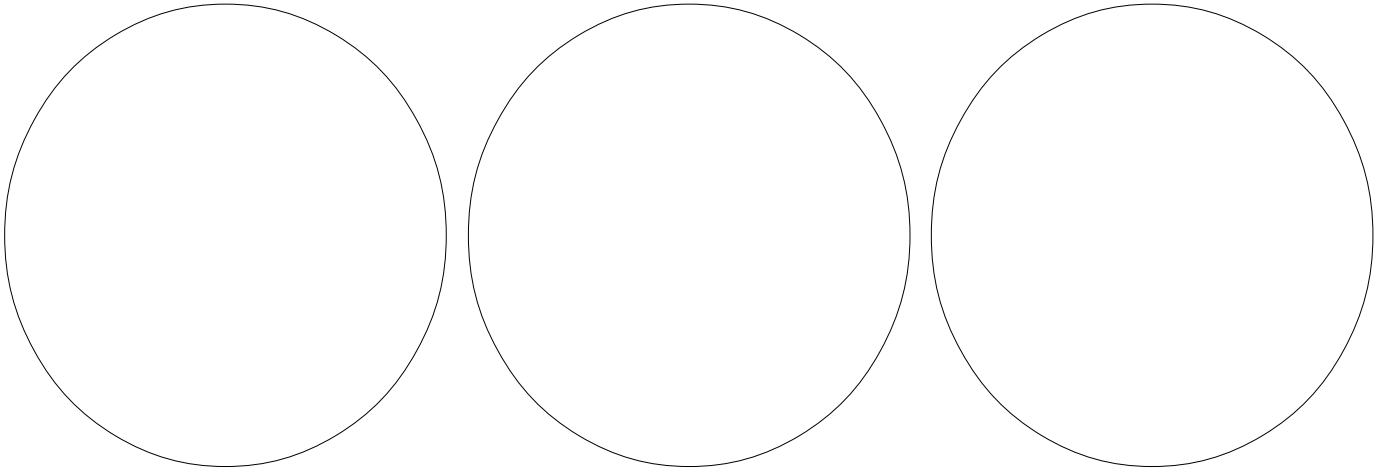
3. _____

3. _____

3. _____

Class: _____
Name: _____
Date: _____

Now shave off a thin piece from a deeper layer of the leaf from each plant. Look at it under the microscope and sketch what you see:



Plant: _____ Plant: _____ Plant: _____

Name three ways each is different from the others:

- | | | |
|----------|----------|----------|
| 1. _____ | 1. _____ | 1. _____ |
| 2. _____ | 2. _____ | 2. _____ |
| 3. _____ | 3. _____ | 3. _____ |

Questions:

1. Were there many differences between the seaweed cells from different parts of the plant?

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2. Are the rootlike parts of seaweed roots? What do you think this part of the plant is used for? How do each of these plants get nutrients?

3. Did you notice air bubbles in the eelgrass plants? Why do you think those are useful? Bonus: When might this be a problem?

4. Were you able to find chloroplasts, the green organelles, which look like green bubbles in the photo below? Was there a difference in where they were located? Why might this be?

