



Upham Woods Grab and Go: D.O.T.S. Tool – Wi-Fi Microscope

Concept:

Learn how to use the Wifi Microscope to take a deeper look at nature and understand that living things are made of cells.

Age level:

4th-12th

Education Standards:

MS-LS2-5 MS-PS4-3 MS-ETS1-1.
MS-ETS1-2. MS-ETS1-3 MS-ETS1-4
MS-LS1-1.

Success Indicator:

Students will be able to conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.

Preparation

Time: 20-30 min

Space: Classroom

Materials:

Aven Mighty Scope and tablet
Paper
Pencils
Coloring pencils, crayons, or markers
Leaf
Organism

Background Information:

Technology has been integrated into virtually every facet of education. Through Digital Observation Technology Skills (DOTS) youth are able to experience and identify various aspects of nature through technology. One of the tools used to make these connections is the Aven Mighty Scope. It is a handheld microscope that uses the tablet as a screen for the whole group to see at the same time.

How- To:

1. Turn on the microscope by sliding the switch to the 'on' position.
2. Turn on the tablet.
3. Scroll to the 'Administrative' app and open it.
4. Open settings and click on the Wi-Fi.
5. When it appears, select the Wi-Fi named microscope and a number.
6. If prompted for a password enter 'uphamwoods'
7. Go back to the main screen of the tablet by pressing the circle button on the bottom of the tablet.
8. Open the app on the tablet named Wi-Viewer.
9. Press the 'On' button in the lower left of the tablet
10. Point the microscope towards an object and the image will appear on the tablet.
11. If the image is blurry, adjust the magnification by turning the yellow dial on the front of the microscope.
12. If it is too dark, adjust the light by turning the dial on the handle of the microscope.
13. To take a picture, either press the camera button on the front of the microscope or on the tablet.
14. Keep microscope steady than adjust the magnification for the best pictures.
15. When done, turn off the microscope and tablet.



Helpful Hints Prior to Activity:

- You can freeze an image to study it more carefully by pressing the 'freeze' button on the tablet.
- If the image is not appearing on the tablet, exit out of the Wi-Viewer app completely and re-open it.

Deeper Thinking Questions:

1. What differences did you notice between the top of the leaf and the bottom?
2. Why are leaves different on the top and bottom? (Purpose, function, gas exchange, photosynthesis, etc.)
3. What similarities did you notice?
4. What do you/did wonder about during this activity?
5. What do the different parts of the leaf remind you of?



Mapping Activity Instructions:

1. For this activity students will be learning how to use the handheld microscope to explore leaves and organisms.
2. Have all students begin with 1-2 pieces of blank paper, leaves, a pencil, and coloring utensils.
3. Ask students to discuss anything and everything they notice about the leaf in front of them. (Color, structure, type, where it came from, if they have seen it before and where, is there anything on it, etc.)
4. Ask them if they think there is more to the leaf that they cannot see, if yes ask them what and if no, ask why. Discuss
5. Show students how to connect the microscope or already have it connected and talk about what microscopes do.
6. Then have a student or the instructor focus the microscope on the top of the leaf until the image is clear.
7. Freeze the image on the tablet.
8. Have students or the instructor hold up the tablet for all to see.
9. Ask them to write top on one side of their paper and then draw what they are seeing. You can have them map the whole top of the leaf or a section.
10. Then have them write down observations on their paper next to their drawing.
11. Next, flip the leaf over and have yourself or a student focus the microscope until they have obtained a new clear image.
12. Freeze the image on the tablet.
13. Have students or the instructor hold up the tablet for all to see.
14. Ask them to write bottom on one side of their paper that is still blank. Then draw what they are seeing. You can have them map the whole bottom of the leaf or a section.
15. Have them write out their observations about the bottom side of the leaf next to the image they drew.
16. Lastly, break them into small groups of 3-6 students and as a group compare and contrast the tops of their leaf drawings to the drawings of the bottom. Discuss



Mix Up the Activity:

Another option for this activity is to look at other organisms. Depending on the amount of time it takes for the leaf mapping it is possible to do both. Find any organism that is living or was living. Macroinvertebrates work well but be careful not to injure whatever organisms chosen. Many small plants, algae, fungi are also great to study. Each student could be instructed to find their own organism to study that they are curious about.

REMEMBER The intention is to have students come to the conclusion that all living organisms are made of cells.