

Name _____

Lab # _____

Hidden Microbes

Objectives: In this laboratory, you will engage in several activities designed to acquaint you with one-celled organisms, many belonging to the Protist Kingdom. It will help you understand how these organisms are adapted for carrying on life functions.

Part I:

Anton van Leeuwenhoek, the famous Dutch microscopist, was a careful observer of nature who provided volumes of vivid description of cells and organisms that can still be used and understood by modern biologists. Scientists must communicate observations clearly. The following passage is a translation of part of Leeuwenhoek's "letter on the Protozoa." Read the passage and draw the little "animalcule" he described to the best of your ability. Pay careful attention to details.

Of the first sort that I discovered in the said water, I saw, after diverse observations, that the bodies consisted of 5, 6, 7, or 8 very clear globules, but without being able to discern any membrane or skin that held these globules together, or in which they were enclosed. When these "animalcules" bestirred themselves, they sometimes stuck out two little horns, which were continually moved, after the fashion of a horse's ears. The part between these little horns was flat, their body else being roundish, save only that it ran somewhat to a point at the hind end; at which pointed end it had a tail, near four times as long as the whole body, and looking as thick, when viewed through my microscope, as a spider's web. At the end of this tail there was a pellet, of the bigness of one of the globules of the body ; and this tail I could not perceive to be used by them for their movements in very clear water. These little animals were the most wretched creatures that I have ever seen; for when, with the

pellet, they did but hit on any particles or little filaments (of which there are many in water, especially if it hath but stood some days), they stuck entangled in them ; and then pulled their body out into an oval, and did struggle, by strongly stretching themselves, to get their tail loose ; whereby their whole body then sprang back towards the pellet of the tail, and their tails then coiled up serpent- wise, after the fashion of a copper or iron wire that, having been wound close about a round stick, and then taken off, kept all its windings. This motion, of stretching out and pulling together the tail, continued; and I have seen several hundred animalcules, caught fast by one another in a few filaments, lying within the compass of a coarse grain of sand.

Analysis:

1. Draw what you think the Vorticella sp. looks like according to Leeuwenhoek's description.
2. What is the value of such a detailed description today?

3. Why was the word "animalcule" put in quotation marks?

Part II: Virtual pond dip

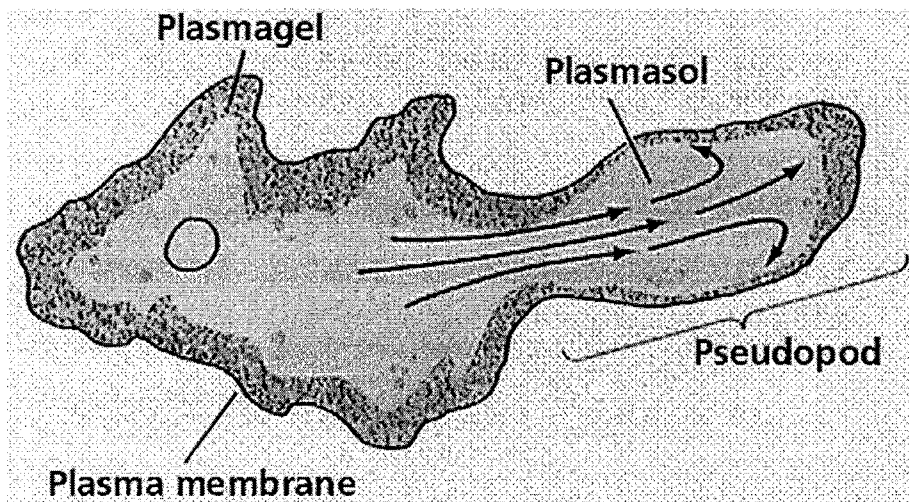


Visit the website: <http://www.microscopy-uk.org.uk/index-no-ads.html?http://www.microscopy-uk.org.uk/ponddip/>. You can type it in or scan the QR code with your phone.

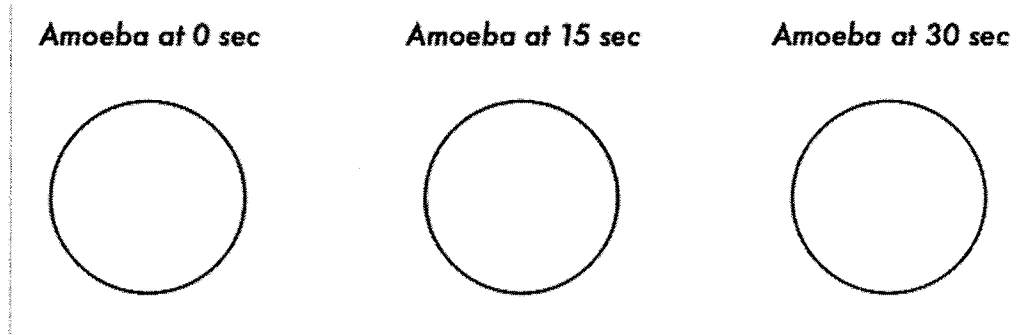
1. Find the Vorticella sp. in the jar. Compare it to your drawing. How accurate were you?
2. Find 5 other organisms, including the amoeba. Click on each and answer the following questions on your looseleaf.
 - a. What is the name of the organism?
 - b. What kingdom does it belong to (look at the bottom of the description)?
 - c. List three facts about each of the organisms you chose

Part III: Analyzing Amoeba

Amoeba are unicellular protozoa that move using pseudopods; a pseudopod, or "false foot," is a temporary bulge in the cell membrane due to the movement of the cytoplasm. The pseudopod is used for locomotion and obtaining food. *Note that the "plasmagel" is the cytoplasm and "plasma membrane" is referring to the cell membrane.



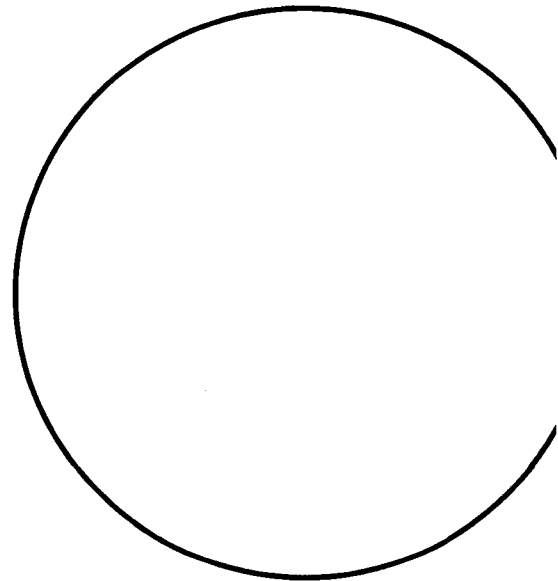
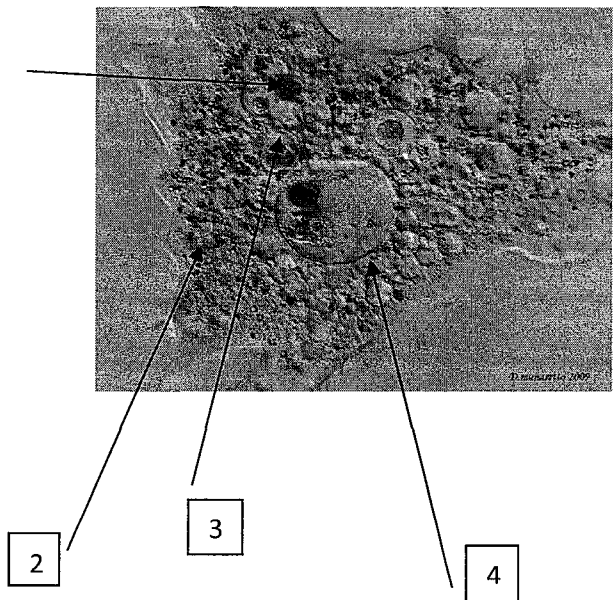
As you watch the video of an amoeba in motion on the interactive board, draw its appearance at each time interval, including an arrow in your drawing to indicate direction of movement.



Part IV: Finding live amoeba using compound light microscopes

- Your teacher will assist you in preparing a slide containing live amoeba.
- Once you have located at least one amoeba, draw what you see in the field of view, and try to label the following:
 - Nucleus (circular, darker in color with a rough surface)
 - Contractile vacuole (large, clear circle)
 - Food vacuoles (smaller and greenish due to the fact they consume chlorella)
 - Cell membrane (outer border)

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Questions for Reflection:

1. How is the amoeba an example of an organism? (Hint: Think of the characteristics all living things have in common)
2. How would you classify an amoeba (plant-like, animal like)? Support your answer with evidence.
3. Research chlorella, the main food source for amoeba. Based on your findings, what is the niche of amoeba?

