

# Characteristics of organisms



The concept investigated was observing the various characteristics of organisms and classifying each of them into specific groups of organisms. This concept will help lead to answering the guiding question: How should the unknown organism be classified? because the unknown organism can be classified based on known characteristics on animal and plant cells. Animal and plant cells contain membrane-bound organelles including the nucleus, and therefore are eukaryotes.

Plant and animal cells having varying organelles. For example, a plant cell has a cell wall that surrounds the cell membrane, while an animal cell does not have this structural feature. Plant cells also have chloroplasts in order to carry out photosynthesis and animal cells do not have this feature because they do not make their own food. Taxonomy is a field of science in which organisms are described, named, and classified. Taxonomy is a very crucial aspect to science because by giving various species unique names, they can easily be studied. With taxonomy, biodiversity can be understood more, and scientists can make predictions based off the knowledge of similar organisms.

In the investigation, cheek cells (animal), Elodea cells (plant), Euglena cell (protist), and unknown cells were gathered and then observed under the microscope. For all the cell types, a wet mount was used because it can quickly and easily be prepared, and improves image quality as it does not alter the natural color of the specimen under the microscope. Only the cheek cell was stained with two drops of methylene blue because it will allow the structure in each cheek cell to be easily distinguishable.

The characteristics of each cell was observed under the microscope and organized into various categories according to their color, size, shape, movement, organelles, and if they had a cell wall. Doing this allowed for a better understanding of plant and animal cells and help show the similarities and differences between the two. A magnification of 10x was used for the Euglena, because the various characteristics can be seen clearly with detail.

A magnification of 40x was used for the Elodea cell, the cheek cell, as well as the unknown cell. Possible ways to reduce error was to not put so many drops when creating the wet mount because it can create bubbles which can interfere with what you are trying to observe under the microscope. Another possible way to reduce error was to not touch the slide with your finger when creating the wet mount. The slide should be held at its corners, then places on a paper towel so the sample organism can be gathered without any possible contamination from fingers.

After conducting the investigation, the unknown specimen was observed to be a protist. When observing the specimen under the microscope, it had membrane-bound organelles including a nucleus, a cell wall, and a flagellum which allowed it to have quickswimming-like movements. Movement suggests that it is a protist because it is known that protists have the ability to search for their own food. Plant cells contain chloroplast and do not move, which indicates that the unknown specimen could not be a plant cell because it lacked chloroplast and was able to swim around.

Animal cells are multicellular which shows that the observed specimen could not be an animal cell because it was observed to be unicellular. When

comparing the unknown to the human cheek cell, it further supports that claim that it could not be an animal cell because of its very small size compared to the cheek cell. When the Euglena's characteristics were observed, the unknown cell showed to have very similar traits, and this information was also used to easily identify the unknown specimen as a protist. This can overall explain that protists are categorized under the domain Eukarya and belong to the kingdom Protista.

The protist can have very similar characteristics to other kingdoms, but it is neither plant, animal, or fungi. The results were compared to multiple groups whose unknown was a protist. They had very similar evidence on why the unknown was a protist, stating that it had membrane-bound organelles and it had the ability to move and search for its own food. The claim can be considered reliable and valid because all groups had similar observations that revealed the unknown to be a protist.