

# CLASSIFICATION OF ORGANISMS

## Using Digital Photography

**GRADE LEVEL:** 10th

**CONTENT AREA:** AP Biology

**SSS:** SC.H.1.4.1, SC.H.1.4.2, SC.H.1.4.3, SC.H.2.4.2, SC.G.1.4.1, SC.F.1.4.2.

### INTRODUCTION

Classification is simply an organizational tool utilized in some way by all life. Humans classify things such as, food, clothing, and friends. Fishermen classify fish, cooks classify spices, and biologists classify organisms. Biologists use the Linnaean system of classification (Kingdom, Phylum, Class, etc.) also known as taxonomy to group like organisms together.

### STUDENT LEARNING OBJECTIVES

Student will use digital photography to identify and classify living organisms.

### MATERIALS

#### Teaching Aids

Examples of images used to classify organisms.

5 Digital Cameras

### PROCEDURES

#### Agenda

Quick Write: Why is it important to classify organisms?

Short lecture and examples

Cooperative Groups

#### Quick Write (5 min)

Students pull out a sheet of paper and list 5 reasons why they think it's important for scientists to classify organisms. Students generally understand the usefulness of organizing animals, but they don't understand that animals are organized based on rules governed by natural selection and that classification systems are hypotheses that give support to the theory of evolution

#### Lecture (10 min)

Students can easily classify their socks by color or their favorite movies by actors, but understanding and using multiple level classification systems requires practice. Ask students if they organize their books by Fiction/Non-fiction then Author then Year then # pages. None of the students would imagine doing such a nerdy thing. Yet, if they had a collection of a hundred books, they would certainly recognize the need for such a system.

For biologist, multiple level classification systems are necessary for tracking the millions of organisms on the planet. Traditional classification known as **taxonomy** is used to place organisms into discreet categories (Kingdom, Phylum, Class, etc) based on similar characters (Hair, wings, limbs), but this creates problems

since not all characters should be weighted equally (wing development vs. toe-nail length), thus new methods for classifying organisms have been developed. Though taxonomy is still widely used by biologist and the classification levels still serve as the foundation for grouping organisms, new methods such as systematics and cladistics are becoming widely recognized as more natural methods for explaining relationships among extant and extinct organisms. Here's one example that may help differentiate between the two terms.

**What If?** Aliens come to Gainesville, randomly capture one hundred humans, and take them back to the space ship. In the space ship, the captives are exposed to space-gas. Thirty humans fall asleep and seventy do not. Why didn't all the humans fall asleep, the aliens wondered. They check their taxonomic keys for a description of *Homo sapiens*, they verify all captives are *Homo sapiens*, but they just can't find anything wrong. **Q:** Ask the students for possible explanations. **A:** Even though all captives are *Homo sapiens*, individual differences exist within.

The aliens are very scientific so they take blood samples from all the captives. **Q:** What do you think they found? **A:** Members of each group shared a common ancestor (a great-great grandfather) who was either immune or not immune to the chemicals in the space-gas. Perhaps, they should have just focused their capture on individuals from the same family line.

#### Groups (40 min):

**Planning (5 min):** Students will divide into two groups of 4-5. Each group will be given 10 minutes to construct a list of potential organisms located on school grounds that can be grouped using the classification levels (Kingdom, Phylum, Class, Order, Family, Genus, Species).

**Collecting (15 min):** Students will have 15 minutes to venture around school grounds and capture images of organisms that can be grouped at the Kingdom, Phylum, and Class levels. In addition, students must capture images of at least three organisms in the same classification level (within group). For example, to fulfill the requirement for Class level, students might capture an image of the basketball coach (Class: Mammalia). To fulfill the within group requirement, students could use the image of the basketball coach in combination with images of the principal and school nurse. Additionally, organisms do not have to fall within the same classification levels, so you may capture images of fungi, plants, insects, and group them however you want. Students must return with no less than five unique images.

**Classifying (20 min):** Using the class laptops, students will download their images and develop a PowerPoint presentation with images organized by classification levels, including the within group images. In addition, the within group images should be accompanied with bulleted lists of characteristics (see example below). You may design the presentation any way you like, but to receive credit, each group must turn in their presentation before they leave class.

## **ASSESSMENT**

Students will develop a group presentation using PowerPoint that includes at least five digital images classified according the classification levels and a comparison between three organisms within the same group.

## **REFERENCES**

American Museum Of Natural History

<http://www.amnh.org/exhibitions/permanent/fossilhalls/cladistics/>

George Washington University

<http://taxonomy.zoology.gla.ac.uk/teaching/Cladistics.pdf>

The Tree of Life Web Project

<http://tolweb.org/tree/phylogeny.html>

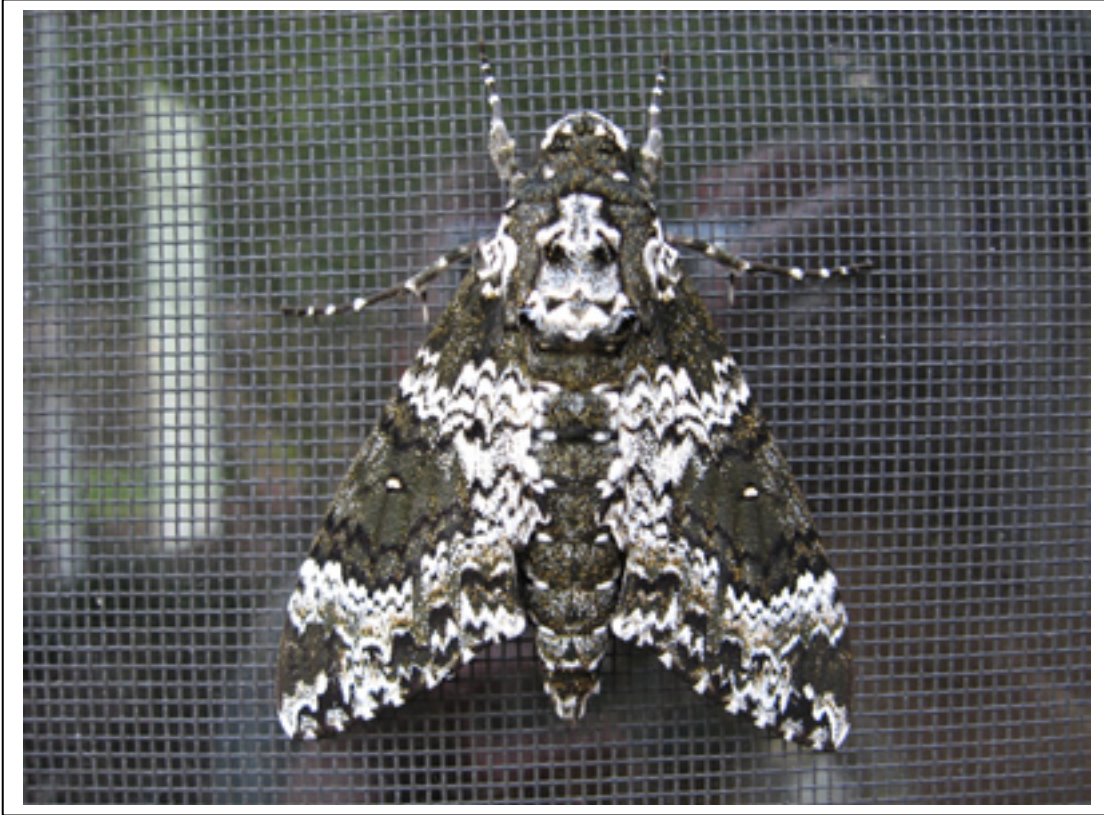
## **EXAMPLE PRESENTATION**

These images were all captured in my backyard.

**KINGDOM:** Fungi



**PHYLUM:** Chordata



**CLASS:** Amphibia



**WITHIN GROUP COMPARISON: Class Amphibia**



Yellow blotches  
Bumpy, warty skin  
Large wide mouth  
No toe pads

Small yellow spots  
Dark brown skin  
White horizontal lines  
Toe pads

Orange eyelids  
Dark green skin  
White horizontal lines  
Toe pads