**Classify It!**

**MATERIALS**

Classroom supplies like:

* Stapler
* Tape
* Ruler
* Paper
* Dry-erase markers
* Dry-erasers
* Markers
* Pens
* Pencils
* Crayons
* Paper clips
* Glue

**PURPOSE**

To show students that many kinds of organisms can be sorted into groups in many ways using various features to decide which organisms belong to which group.

**CONTEXT**

Classification systems are not part of nature. Instead, they are frameworks created by biologists to help them understand and describe the vast diversity of organisms and suggest relationships among living things.

With the help of the Science NetLinks’ Classify It! app, in this lesson students have the opportunity to move from invented classification systems to those used in modern biology. Classify It! is a fun, challenging game that asks students to choose the correct organisms for a specific category. Categories include Living Things That Are Animals all the way to Organisms That Are Protists. As students progress through the game, they can win “Creature Cards” that provide interesting information about organisms like a bottle-nosed dolphin and a volvox.

The first part of the lesson requires students to think about how to classify objects in a classroom in order to review what they may have learned in lower grade levels and check for misconceptions. The rest of the lesson focuses on classification systems used by biologists and demonstrates how living organisms can be classified in a variety of ways. The Classify It! app helps to solidify these concepts for students.

Students already can understand and appreciate the diversity of life. This comes from their ability to see the patterns of similarity and difference in organisms that permeate the living world. They just need help moving toward a more sophisticated understanding of the features of organisms that connect or differentiate them. This lesson provides students with an opportunity to further their understanding of the classification of organisms.

Ideas in this lesson are also related to concepts found in these Common Core State Standards:

* CCSS.ELA-LITERACY.RI.6.7 Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.
* CCSS.ELA-LITERACY.RI.8.7 Evaluate the advantages and disadvantages of using different mediums (e.g., print or digital text, video, multimedia) to present a particular topic or idea.
* CCSS.ELA-LITERACY.RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts.
* CCSS.ELA-LITERACY.RST.6-8.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6-8 texts and topics*.

**PLANNING AHEAD**

We suggest that you check out the Classify It! app before conducting this lesson with your students. We also suggest that you load the app onto the mobile devices in your classroom. You can learn more about the app on our [Classify It!](http://sciencenetlinks.com/classify-it/) page.

**MOTIVATION**

Begin the lesson by asking students, “What do you know about classification?” Accept all answers and encourage students to explain their answers. You should make a list of their ideas on a blackboard, a Smartboard, etc. Students can revisit this list at the end of the lesson. Students may have had some experience with classification activities in elementary school. Get your students to elaborate on what kind of experience they’ve had with classification.

Once you’ve gotten a good idea about your students’ understanding of classification, engage them in a classroom activity in which they classify classroom objects into various categories. You could engage them in this activity by starting with a discussion about how hard it would be to do class work in a messy classroom. Explain to students that organizing (or classifying) things helps to make the class run more smoothly. It also helps us to understand the purpose for each thing and the similarities and differences among the objects. Ask students:

* Imagine if this room were messy. How would we find the supplies we need in order to do our projects and learn?
* How would classifying the items in this room help us understand them and use them?
* How would you sort/classify the items to make the best use out of them? Think about how they are similar and how they are different.

(Answers will vary. Encourage students to explain their answers.)

Now divide your students into groups and ask them to do the activity on the [Classify Classroom Objects](http://sciencenetlinks.com/student-teacher-sheets/classify-classroom-objects/) student sheet. This activity asks students to sort some typical classroom objects into different groups based on their own ideas about how they should be grouped.

Once students have finished this activity, bring the class back together to go over how each group classified the objects. Ask students these questions:

* What characteristics did you look at in order to decide in what group to place an object?
* Did an object fit into more than one group? Why or why not?
* Do you think that scientists use classification when they are studying things? If so, how and why?
* Do you think that scientists classify organisms?
* Why do you think scientists like to classify organisms?
* Does classifying these organisms into certain groups help scientists study them?
* How does classification help scientists study organisms? How not?

(Answers may vary. Encourage students to explain their answers.)

**DEVELOPMENT**

In this part of the lesson, students should use the Classify It! app to test their own knowledge about various living organisms and see how they can be classified in many ways.

Before they do the app, students should use their [Classify It](http://sciencenetlinks.com/esheets/classify-it/) student esheet to view the[Kingdoms of Life](http://studyjams.scholastic.com/studyjams/jams/science/animals/kingdoms-of-life.htm) video, from Scholastic. This video provides a brief overview of the five different kingdoms: animal, plant, protist, fungi, and bacteria.

As students watch this video, they should answer the questions on the [Classify It](http://sciencenetlinks.com/student-teacher-sheets/classify-it/) student sheet:

* Why do scientists care about what kingdom an organism would belong to?

(Scientists use the kingdoms to help them understand the similarities and differences between organisms.)

* What are the five kingdoms discussed in this video?

(They are animal, plant, protist, fungi, and bacteria.)

* What is an animal?

(An animal is any living creature that can breathe and move around. It doesn't make its own food and has many cells.)

* What is a plant?

(A plant is any organism that has a green pigment called chlorophyll. It uses chlorophyll to make its own food through photosynthesis. It has many cells but it can’t move around on its own.)

* What are fungi?

(Fungi have no roots or flowers, no chlorophyll, and can’t make their own food. They eat decaying matter.)

* What are protists?

(Protists include algae, amoebas, and protozoans. They’re single-celled organisms that live together in colonies. Many can make their own food. Most can only be seen with a microscope.)

* What are bacteria?

(Bacteria are everywhere. They’re tiny and have only one cell and can only be seen with a microscope. Bacteria can help to break down food and other organisms.)

* Do you think that organisms always fit neatly into these kingdoms? Why or why not?

(Answers may vary. Encourage students to explain their answers.)

Now that students have learned more about the classification of organisms, they should try to apply that knowledge to the Classify It! app. This app should help students understand that many kinds of organisms can be sorted into groups in many ways using various features to decide which organisms belong to which group, and that classification schemes will vary with purpose.

You may want to point out to students two common problems with classification before students play the game. First, not everything fits a simple yes/no (or dichotomous) classification key. Second, even classification experts may disagree on how to describe the features of a specific organism.

The app is divided into three modes: Easy, Intermediate, Advanced. The questions for each mode progress in difficulty such that the questions and organisms featured in the Easy mode are appropriate for students at the upper elementary level while those in the Intermediate and Advanced modes are more appropriate for middle-school students.

When students access the app, they’ll see that they can add themselves in as a player by going to “Change Player.” They can choose their own avatar and type in a name for it. Students can choose to play all three modes of the game in order and try to accumulate all of the Creature Cards in the game or they can choose to just do certain modes.

If you want students to play all the way through the game, this can take quite a bit of time. One way to get around that would be to assign students to play just one mode and play to win the Creature Cards for that mode. Students will use the Creature Cards in the Assessment for the lesson.

As students play the game, they should answer these questions on the Classify It student sheet:

* What characteristics did you consider to help you classify the organisms?
* Did some of the organisms fit into more than one category?
* Why do you think some organisms would fit into more than one category?
* Did you learn anything new about organisms as you went through this game? If so, what?

(Answers may vary. Encourge students to explain their answers.)

**ASSESSMENT**

To assess student understanding for this lesson, ask students to use the information on the Creature Cards they’ve collected and classify those organisms into the categories they think are appropriate. One way to do this would be to divide your students into three different groups—one for each mode and set of 13 Creature Cards. Students can use the table on the Classify It student sheet to help them do this activity. When they do this classification, they should think about the formal classification system that scientists use and sort the organisms into the five different kingdoms: animal, plant, protist, fungi, and bacteria. When students have finished classifying their set of Creature Cards, bring the groups back together and have them share their classifications.

Finally, revisit with students the question asked at the beginning of the lesson: What do you now know about classification? You can create a new list with your students and then compare their ideas now with what they thought at the start of the lesson. Have their thoughts changed? If so, how?

**EXTENSIONS**

[Classify That!](http://sciencenetlinks.com/lessons/classify-that/) is another Science NetLinks lesson that can expand students’ knowledge of living organisms and further develop their ability to group, or classify, living organisms according to a variety of common features.

In [Identification and Classification of Grassland Plants](http://sciencenetlinks.com/lessons/identification-and-classification-of-grassland-plants/), students have the opportunity to observe the similarities and differences among plant species.

The [Tree of Life](http://www.amnh.org/ology/features/treeoflife/), from the American Museum of Natural History, introduces students to cladistics, a classification system that scientists use to show the relationships between species.

Source: http://sciencenetlinks.com/lessons/classify-it/