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- Title of Lesson: Characteristics of Animals

Class Type: General Biology

Length of class: 50 min.

Motivation: (20 min)

Show a brief video clip of a hydra engulfing a daphnia (water flea).
http://www.youtube.com/watch?v=Ut-ZZeNmbSc

Pose the following questions to the students:

- How would you describe the relationship between the daphnia and the hydra?

- Do you think the hydra is an animal? Why or why not?

- What characteristics do they have that would identify them as members of the animal kingdom?

Immediately after students are seated, administer the animal classification pre-test. An identical Post-Test will be given at the onset of the next day’s class session. (10 min)

Explain to the students that today we will investigate the characteristics that are used to classify animals.
**Needed Materials & Set-Up:**

**Materials:**
- Make one copy of the “Animal Classification Activity” worksheet for each student. This handout was modified from the following site (see attachment).
  [https://fp.auburn.edu/asim/State%20PAGES/Project%20Files/AHSGE%20Activities/COS11Animal%20Classification.pdf](https://fp.auburn.edu/asim/State%20PAGES/Project%20Files/AHSGE%20Activities/COS11Animal%20Classification.pdf)

- Each student will need notebook paper and pencil to record observations and answer questions.

- Make one copy of the pre-test & post-test for each student prior to the lesson.

**Technology:**
The teacher will need a projector and internet access to display the images needed for the lesson (see hyperlinks in presentation and participation).

**Student groupings:**
The seating arrangement desk will be in rows with seating assignment made by teacher to minimize talking during lecture. When the student activity starts, students will move to lab tables with their partner (See attached classroom diagram for an example of lab table arrangement). If lab tables are not available, students can push two desks side by side.

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**Outcomes**

**Specific Learning Outcomes:**
When provided a dichotomous key, students will correctly classify animals based on their characteristics with 80% accuracy (ANALYSIS).

Given a post-test on the characteristics of animals, students will answer questions with 80% accuracy (APPLICATION).

**FL-NGSSS:**

SC.912.L.15.6: Discuss distinguishing characteristics of the domains and kingdoms of living organisms.

SC.912.N.1.1.: Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following:
7. Pose answers, explanations, or descriptions of events,
9. Use appropriate evidence and reasoning to justify these explanations to others.

**Dimensions of K-12 Science Education Standards:**
1. Scientific and Engineering Practices
   1. Asking questions
   8. Obtaining, evaluating and communicating information
2. Crosscutting Concepts
   1. Patterns
3. Disciplinary Core Ideas
   Life Sciences – LS 4: Biological evolution: Unity and diversity

**Common Core Literacy Standards:**
1. Reading Standards – Integration of Knowledge and Ideas, Key Ideas and Details
2. Writing Standards – Research to build and present knowledge
3. Language Standards – Conventions of standard English

**Presentation and Participation: Amanda**

Prior to completing the activity, the teacher should review the Linnaean classification system to show the seven levels of classification pertaining to the classification of animals. (BEHAVIOR)

On the projector, display an image of Linnaean classification of a group of animals found at [http://www.educationworld99099.blogspot.com/2013/03/biological-classification-of-animals.html](http://www.educationworld99099.blogspot.com/2013/03/biological-classification-of-animals.html). Discus where separations occur among the animals.


Distribute copies of the handout “Animal Classification Activity” to each student.

Place students in groups of 2.

Explain to the students that in this activity, they will use a dichotomous key to classify animals.

Using a projector, display page three of the “Animal Classification Activity” worksheet titled “Using a Dichotomous Key”. Read #1-4 in the “directions” aloud to students.

Give the students time to describe the animals (direction #3) and answer the questions (direction #4) (COGNITIVE)

Read direction #5 and #6 (below) on the animal classification worksheet aloud to the students.

5. Use the **Dichotomous Key** on the next page to identify each of the twelve animals in the pictures.
   a. Start with question #1, and answer the question about the animal. Based upon your answer to question #1, you will go to another question.
   b. Once you go to the next question you are directed to, answer that question.
   c. Continue this process until you have identified the animal.
   d. Return to Question 1 and repeat process to identify each new picture/animal.

6. Write the name of the animal on your notebook paper next to its corresponding number and
Demonstrate to students how to use the dichotomous key by modeling using the organism in picture #1. (APPLICATION/PROCESS)

Students will now identify the remaining animals using the dichotomous key. (20 min.)

Display the pictures of the animals on the projector. Call on students to correctly identify each organism. Clarify any misconceptions using the dichotomous key (5-10 minutes). (OTHER)

| Questions: |
| (3 higher order—analysis, synthesis, evaluation) |
| Why do you think scientists classify organisms? (ANALYSIS) |
| What is the relationship between the hydra and the daphnia (water flea)? (SYNTHESIS) |
| How would you classify the hydra? Justify your answer. (ANALYSIS) |

| Reflection: |
| An initial pre-test at the onset of the lesson will provide the teacher an assessment of the students’ knowledge prior to the instruction. An identical post test administered at the beginning of the next day's class session will measure cognitive growth. The test is a compilation of multiple-choice. Students will be able to view their net gain score from pre-test to post-test as the teacher distributes scored tests. Formative assessment will also occur throughout the lesson as the teacher circulates and asks questions during note-taking session. Verbal feedback will be provided to individuals throughout the lesson based on their answers to the teacher's oral questions. |

| Safety: |
| A brief discussion will be had with regard to the lab being a place of professional educational work and “horseplay” will not be tolerated. A standard lab safety discussion will be conducted in which students are reminded of safety procedures already in place from previous activities. Their attention will be directed to lab safety posters present in the area. Although the activity being practiced does not include any sharp objects it will still be conveyed to the students the importance of conducting themselves in such a way that promotes safety for all. |
Transformative:
(Accommodations for at least 2 special needs students)

(Accommodations for at least 2 special needs students)

Special Needs Student #1: This student is classified ESOL, having Spanish as his first language. The student will be provided a printed Spanish version of all written materials. The Teacher will also model the correct procedure for using the dichotomous key. The student will also be paired up with another capable student to be able to assist him with the activity if needed. The Teacher will check with this student periodically to see if he needs any assistance.

Special Needs Student #2:
This student is visually impaired, although not blind. The student will be provided with written materials in large print. This student will be paired up with another capable student to be able to assist her with the activity if needed. The Teacher will check with this student periodically to see if she needs any assistance.

Special Needs Student #3:
This student has Dyslexia. The teacher will read aloud all of the instructional materials needed as well as perform auditory feedback for this activity. This student will be paired up with another capable student in case this student is in need of assistance. The Teacher will also check with this student periodically to see if he needs assistance.

Utilize:

1. The Pre-Test/Post-Test Challenge: Comparison of Pre-Test and Post-Test will be the first area of concern. If students do not show measurable improvement, then there may be one or more problems with the Lesson Plan:

   a. Pre-Test and Post-Test may not fit the activity closely. If so, we can revise them to more closely match the lessons learned in the activity.

   b. The activity may fail to demonstrate the concepts explored in the Pre-/Post-Test in a way that the students can comprehend. If so, we may need to adjust the activity (or the Teacher’s narrative regarding the activity) until the concepts are more clearly represented.

   c. The higher order questions may not challenge the students to effectively grapple with the information to achieve a deeper understanding of the content. If this is the case, we will need to work to ask more helpful questions and guide the students to better understand the content.

2. The Standards Challenge: We will need to assess the clarity of the coverage of our selected standards. We will need to ask the following questions and make the necessary adjustments:

   a. Do the pre- and post-tests conform well to our standards, and does good performance on the pre- and post-tests correlate to mastery of the standards by our students? This would be measured in the
longer term (such as a chapter or unit test)? If the pre- or post-tests are found to be inconsistent with our standards, we would need to make adjustments to the questions to more closely align with the selected standards.

b. Does the activity properly direct students to a deeper mastery of the selected standards? In this activity the key standard is quite broad (discuss distinguishing characteristics of domains and kingdoms), yet this activity focuses more narrowly on the concepts of classification of animals; and resulting genotypes and phenotypes. We would need to limit our critique to the narrow focus, rather than whether the activity covers the entire standard.

c. Do the higher order questions direct students to a deeper understanding of the standards? If the higher order questions do not aid in the students’ understanding of the selected standards, we need to edit or rewrite them to fit the standards better.

3. The Time Challenge. From pre-test to post-test, there are several components in this activity. The sum total of these components may take longer than the allotted time. Included in our plan is the flexibility to move the first component to the previous day and the last component to the following day. Also every teacher (along with his or her students and his or her school) creates a unique culture that moves at its own pace. We must be flexible to adapt this plan to each individual classroom’s culture.

4. The Facilities Challenge. While we can anticipate that the most teachers can quickly fit the activity to their own space or facilities limitations, there may be spaces that require more changes to the activity.

5. Strengths: This lesson encourages higher level thinking as described in Bloom’s taxonomy. Students will consider questions which require the use of analysis, synthesis, and evaluation in order to give an acceptable answer. For example, students are involved in analysis by the question: “How would you classify the hydra? Justify your answer.”

Their evaluative skill is enhanced by dealing with questions such as: “Why do you think scientists classify organisms?”