

**Pathways for Teaching Science for Diversity and for Understanding
Lesson Plan – Arthropods - Inspired by Beverly Laferty & Mary Lessman**

Grade /Subject: Seventh Grade Biology **Unit:** Arthropods

Lesson Title: Creating an Arthropod

Intended Learning Outcomes: At the end of this lesson, students should be able to:

1. Identify and explain the general body features of arthropods.
2. Compare and contrast the differences between insects and arachnids.
3. Create a model of an arthropod with an adaptation that represents a symbol of their cultural or ethnic background.
4. Explain how various kinds of arthropods can be beneficial/detrimental to humans.

Standards: [Include appropriate standards for your state and/or school district here]

TIME LESSON CONTENT MATERIALS

(For Lessons Materials: See Development, Part B.1 below)

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| 5– 10 min | I. Introduction: A. [Attention Activator] -Tie colorful pipe cleaner around a head band to make a pair of antennae. Put it on and ask students to name the kind of arthropod you may be. B. [Concept Map/Brainstorm—Central term: Arthropods] -Write concept map on butcher paper and keep to use later as assessment tool. -Whole class: Ask students leading questions: What do you know about arthropods? What kinds of animals are arthropods? List the different classes (or kinds) of arthropods. How are various arthropods adapted to survive in their environments? -List responses in English and Spanish on the concept map. | |
| 5 - 10– min | II. Development: A. Mini-Lecture: -Use Transparency #1 Phylogeny of Arthropods (see attached) to highlight the diversity and number of arthropods compared to humans. -Highlight the five most prominent classes of arthropods: arachnids, crustaceans, centipedes, insects, and millipedes. Merostomates represents a class of “living fossils.” -Use Transparency #2 General Traits of Arthropods (see attached) - Have students fill out the terms that have been left blank on handout. -Use Transparency # 3. Differences between Insects and Arachnids (see attached). -Have students fill out the terms that have been left blank on handout -Remind students that these organisms will be studied in more details later. B. <u>Activity</u> [Translational activity/Model Construction] B.1 <u>Orientation</u> - Thank students for bringing recyclable materials such as soda bottles, cardboard, paper, paper rolls, baggies, etc. - <i>Note to teachers:</i> In addition to materials brought by the students, supply markers, metal brads, toothpicks, rubber bands, glue, tape, pipe cleaners, glue guns, and any other materials that will aid in construction. | |

- Give Students a copy of “Creating an Arthropod” (see attached handout #4)
- Explain that each student is responsible to construct their own arthropod but they can help each other with ideas in their collaborative groups. Assign students to heterogeneous groups according to abilities, language skills, and cultural backgrounds as needed.
 - Point out the supply table – and let students know they can use any item on the supply table but they must share resources with everyone.
 - *Caution: Glue guns are hot, so remind students to be careful.*

- 15 – 20 min B.2 Activity [Translational activity/Model construction].
-Students build their own models of Arthropods, but must incorporate real arthropod traits
- Students also incorporate their adaptations that represent cultural or ethnic pride
- 15 – 30 min D. Presentations [Student Presentations & Question & Answer - Whole Class]
- Students will point out important facets of their Arthropods to the class
- The rest of the class will ask probing questions to check if the presented model could “actually” exist in the described environment.
- Students and teacher will also pose questions from the activity handout.

III. Closure [Exit slip]

- A. Answer this question in writing: “Which class of arthropods do you feel is the best adapted to survive on earth and why?”
- B. Clean – up & Set up arthropod models on display area
- C. Homework – (See attached handout)

Attachment #1

Attachment #2

Attachment #3

Creating an Arthropod (Attachment #4)

The six different classes of animals that make up the phylum Arthropoda are arachnids, crustaceans, centipedes, insects, millipedes and horseshoe crabs. Your challenge is to create an Arthropod that is specially adapted to a certain environment. You must also add an adaptation that symbolically represents part of you ethnic or cultural pride. For example, a student of Polish background may talk about how she/he chose to make their arthropod's exoskeleton extra strong to symbolize the struggles of Polish immigrants in this country. A student of Mexican background may choose to talk about how his/her arthropod is extra agile to illustrate her/his admiration for Mexico's National Soccer team.

Even though you have the choice of creating the environment in which your arthropod lives, you must stick to certain "rules." For example, arthropods have an exoskeleton, so participants cannot invent an arthropod with flesh and bones. In this way, you get to show what you really know about arthropods.

As you are designing a model of your Arthropod, answer the following questions. Remember that your collaboration with other class members important. Talk and help each other!

Tu y miembros de tu equipo pueden sentirse libres de escribir tus respuestas en Inglés y/o en Español. El maestro te va a prestar varios libros en Español para ayudarte. También hay un casete en Español acerca de los Artrópodos que puedes llevar a tu casa para estudiar. Buena Suerte.

1. To which class does your arthropod belong?
2. What are the scientific and common names of your new arthropod? Be creative, but use names that describe your arthropod well.
3. Describe its natural habitat.
4. How many appendages does it have? What are they specialized for?
5. Does your arthropod have spiracles? Where are they located?
6. Does your arthropod have antennae? What are they used for?

7. What does it eat? Is it a carnivore, herbivore, or omnivore?
8. Describe the changes your Arthropod goes through during its life cycle. Draw and label its complete life cycle.
9. What are some of the specific adaptations that your Arthropod has and how does that help it in its particular environment?
10. Is your arthropod harmful or useful to the environment? Explain your answer
11. What are the adaptations that are symbolic to your ethnic and/or cultural background? How are these adaptations representative of your cultural heritage?
12. Are there any kinds of arthropods used in special ways in your culture? Tell us how they are used (For example, in Louisiana crayfish is used in many popular dishes).

Homework Questions:

1. What are the differences between the six classes of arthropods? Draw a table to help you organize your answer.
2. How is your arthropod more adapted to its environment than existing (real) ones?
3. Ask a parent or sibling what adaptation they would create to represent a point of ethnic or cultural pride.

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