AMAZING ARTHROPODS
MIDDLE SCHOOL

Life Science TEKS	
Sixth Grade:	6.12C, 6.12E, 6.12F
Seventh Grade:	7.10A, 7.10B, 7.11B, 7.12A, 7.12B, 7.13
Eighth Grade:	8.11A, 8.11B, 8.11C, 8.11D

Life Science Vocabulary

abiotic, adaptations, arthropod, biome, biotic, circulatory, class, community, digestive, ecosystem, endocrine, environment, excretory, exoskeleton, family, fungi, genus, integumentary, kingdom, monera, muscular, nervous, order, organism, phylum, population, protista, reproductive, respiratory, skeletal, species, taxonomist

Pre-Show Activity

Pre-Show Lesson: Animal Classification

Materials:

Per group: copy of alien pictures below, pictures of arthropods (beetle, centipede, lobster, spider, dragonfly, tick, scorpion, horseshoe crab), copy of animal classification chart and outline

Procedure:

1. Student will work in groups to try to classify the alien pictures below. They will write an explanation to explain why they grouped them as they did. There is no right answer to this activity. The purpose is to help students understand the classification process, and for them to see how organisms in different groups may have similar characteristics which can make classification difficult for scientists. (Appendix A-1)

2. Introduce students to the kingdom, phylum, class, order, family, genus, species chart. (See Appendix A-2 for an example.)

Explain that the work of classifying organisms is done by scientists called taxonomists. This hierarchy allows scientists to group organisms based on their similarities.

3. Write the 5 kingdoms on the board and have students identify characteristics of each kingdom in small groups. Record some characteristics for each kingdom. Ask students which kingdom humans belong to?

4. Give each group several pictures of arthropods (beetle, centipede, lobster, spider, dragonfly, tick, scorpion, horseshoe crab). Ask them to look carefully at the organisms to determine which characteristics they all have in common. Give groups time to figure out commonalities of the arthropods. Discuss characteristics of an arthropod (exoskeleton, jointed legs, antennae, more than one set of legs, body symmetry). These common characteristics help taxonomist organize them in groups or phylum within the animal kingdom called Arthropoda. Arthropoda means jointed feet.

5. Explain that animals in the Arthropoda phylum can be divided into smaller subgroups called classes. For example, arthropods that have 3 major body parts and six legs form a class. Turn to your neighbor and tell them what class they form. (Insecta)

6. Students will use the Arthropod classification chart and outline (Appendix A-3 and A-4.) to identify each of the arthropod organism pictures that they were given.

7. Give students the animal groups and species amounts chart. (Appendix A-5.) Cut them apart so they do not know which number goes with which species. With partners have them try to match the estimated amount of known species found in each group. Remind students that these are species groups, not individual organisms. There could be millions or billions of individual organisms.

8. Discuss the actual numbers and ask kids if any of them surprised them. Ask students why scientists make a big deal if one of these species dies? Discuss using the Socratic Method. Hopefully students will bring up the interdependence of species and possible future discoveries, such as new medicines, we may make from studying other species

Post-Show Enrichment Activities

Activity One: What Is Happening To Our Bees?

Put up the statement on the board, “Life on Earth would not really be affected if all the honeybees on Earth disappeared.”

In separate corners of the room, have the following words posted; agree, strongly agree, disagree, strongly disagree. Read the statement posted and have kids go stand in the corner which best describes their belief. Lead students in a discussion of this statement.

Watch a video or read an article about the problem of honeybees disappearing across the U.S. There is a great PBS video on this topic called “Silence of the Bees”. Students will complete a chart taking notes on the video. (Appendix A-6)

Readdress the original statement posted about the importance of bees.

Activity Two: Organization in an Ecosystem

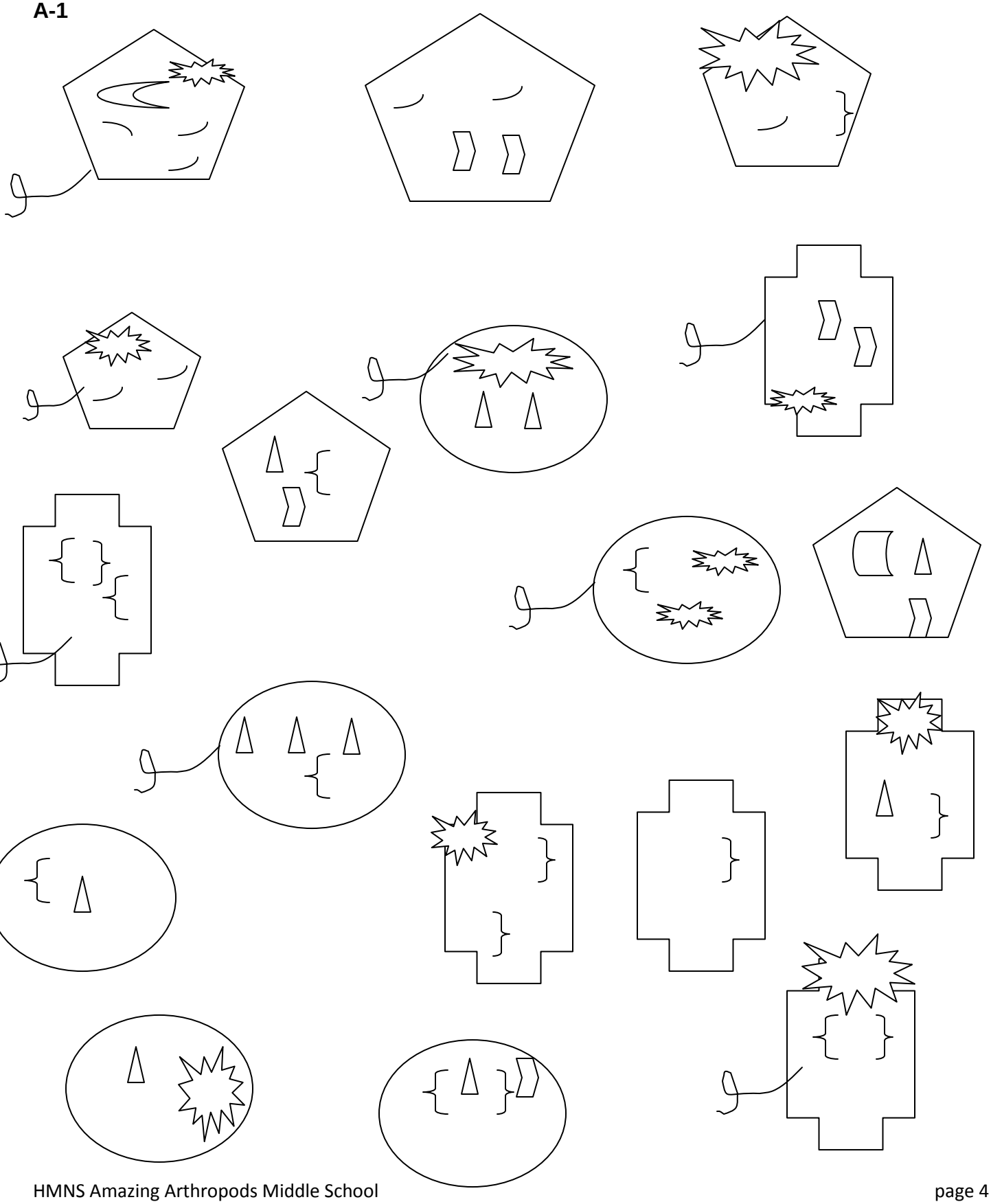
Assign each pair of students an arthropod. You may want to give them a picture of their arthropod. Using books or Internet resources students will create a poster which shows the levels of organization within their arthropod’s ecosystem. This should include organisms, populations, communities and ecosystem. Have students give their arthropod a name. Students will describe the Ecosystem of their arthropod using the diagram below. Students will draw pictures to illustrate each level of organization in the spaces of the triangle. (Appendix A-7)

Activity Three: Arthropod Body Systems

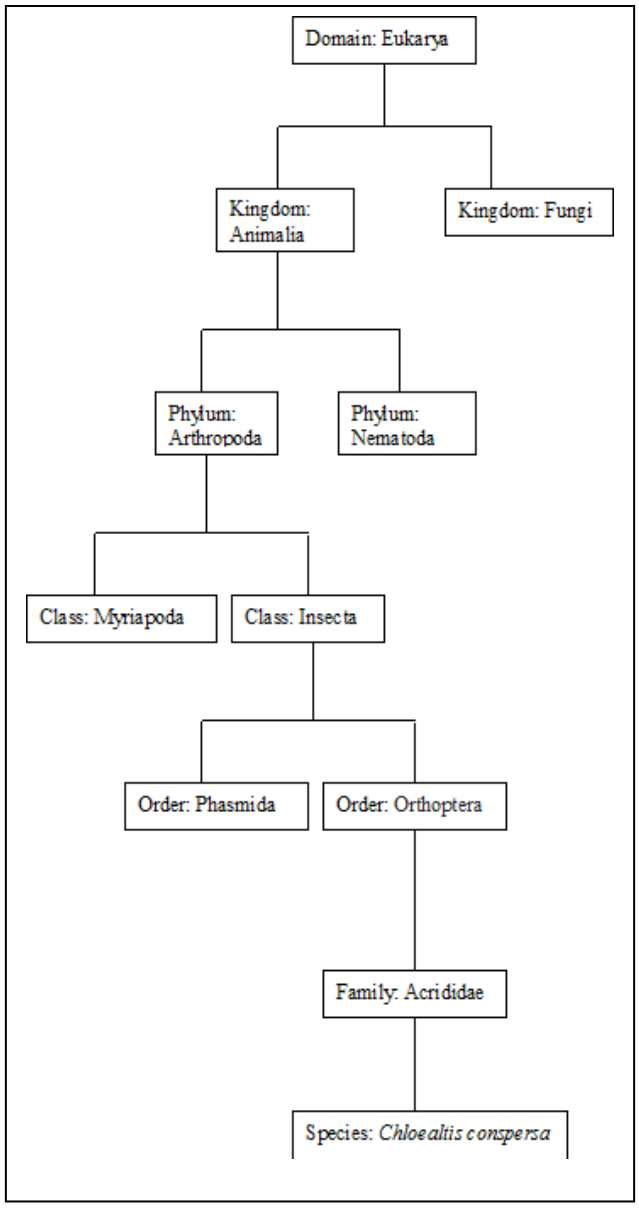
Assign each group a body system (circulatory, respiratory, skeletal, muscular, digestive, excretory, reproductive, integumentary, nervous and endocrine). Groups will research how this system works in an arthropod and a human. They will compare the system of the two organisms and create a poster showing the similarities and differences in humans and arthropods in relation to the given body system.

Appendix

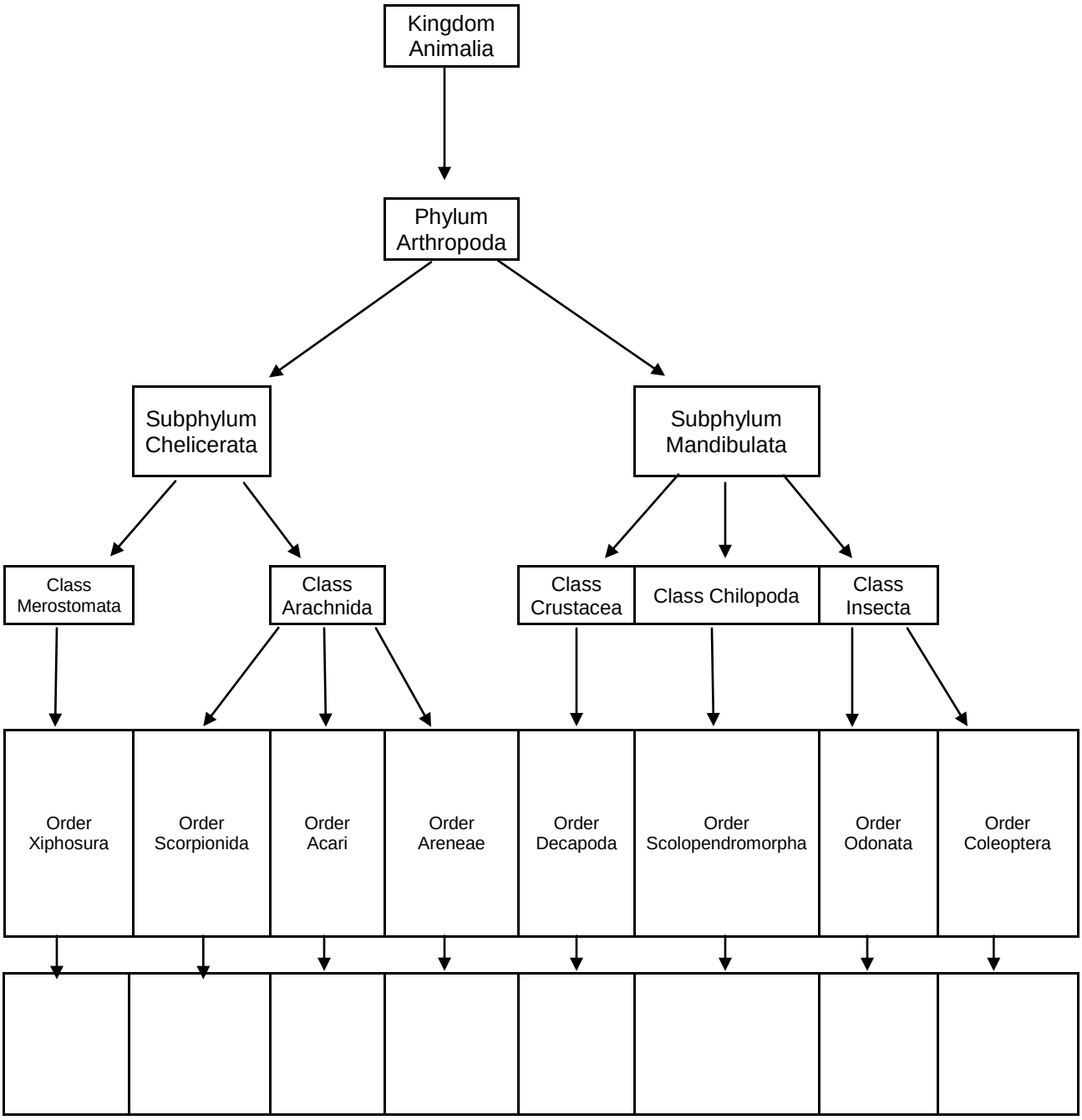
A-1



A-2


Domain: Eukarya
Kingdom: Animalia
Kingdom: Fungi
Phylum: Arthropoda
Phylum: Nematoda
Class: Myriapoda
Class: Insecta
Order: Phasmida
Order: Orthoptera
Family: Acrididae
Species: *Chloealtis conspersa*

A-3


Kingdom Animalia
Phylum Arthropoda
Subphylum Chelicerata
Subphylum Mandibulata
Class Merostomata
Class Arachnida
Class Crustacea
Class Chilopoda
Class Insecta
Order Xiphosura
Order Scorpionida
Order Acari
Order Areneae
Order Decapoda
Order Scolopendromorpha
Order Odonata
Order Coleoptera

Answers

A- 4

Arthropod Classification Outline

I. Subphylum Chelicerata- no antennae, mouthparts are fangs or pincers, two main body segments

A. Class Merostomata- body with a broad oval shell and long slender tail, legs not visible from above
1. Order Xiphosura- large compared to other arthropods, live in saltwater

B. Class Arachmida- eight legs, lives mostly on land
1. Order Scopionida- front claws, has a tail with a poisonous stinger
2. Order Acari- tiny head, rounded body with no waist
3. Order Areneae- thin waist, structures for spinning silk located on abdomen

II. Subphylum Mandibulata- 1 or 2 pairs antennae, mouthpart is mandible used to chew or suck

A. Class Crustacea- twp pairs of antennae, at least five pairs of leg like appendages
1. Order Decapoda- first pair of legs usually has large claws, mostly lives in seawater

B. Class Chilopoda- long and worm-like, one pair of legs per body segment
1. Order Scolopendromorpha- 21 or 23 pairs of legs

C. Class Insecta- one pair of antennae, six legs, three body parts, usually has wings
1. Order Odonata- large compound eyes, four clear or patterned wings, long abdomen
2. Order Coleoptera- har, leathery front wings cover membranous (softer) hind wings, chewing moutparts

A-5

Insects	Over 1,000,000
Birds	9,500
Reptiles	7,984
Mammals	4,500
Fish	23,500
Amphibians	5,400
Sponges	10,000
Mollusks	100,000
Crustaceans	40,000
Arachnids	75,500

A-6

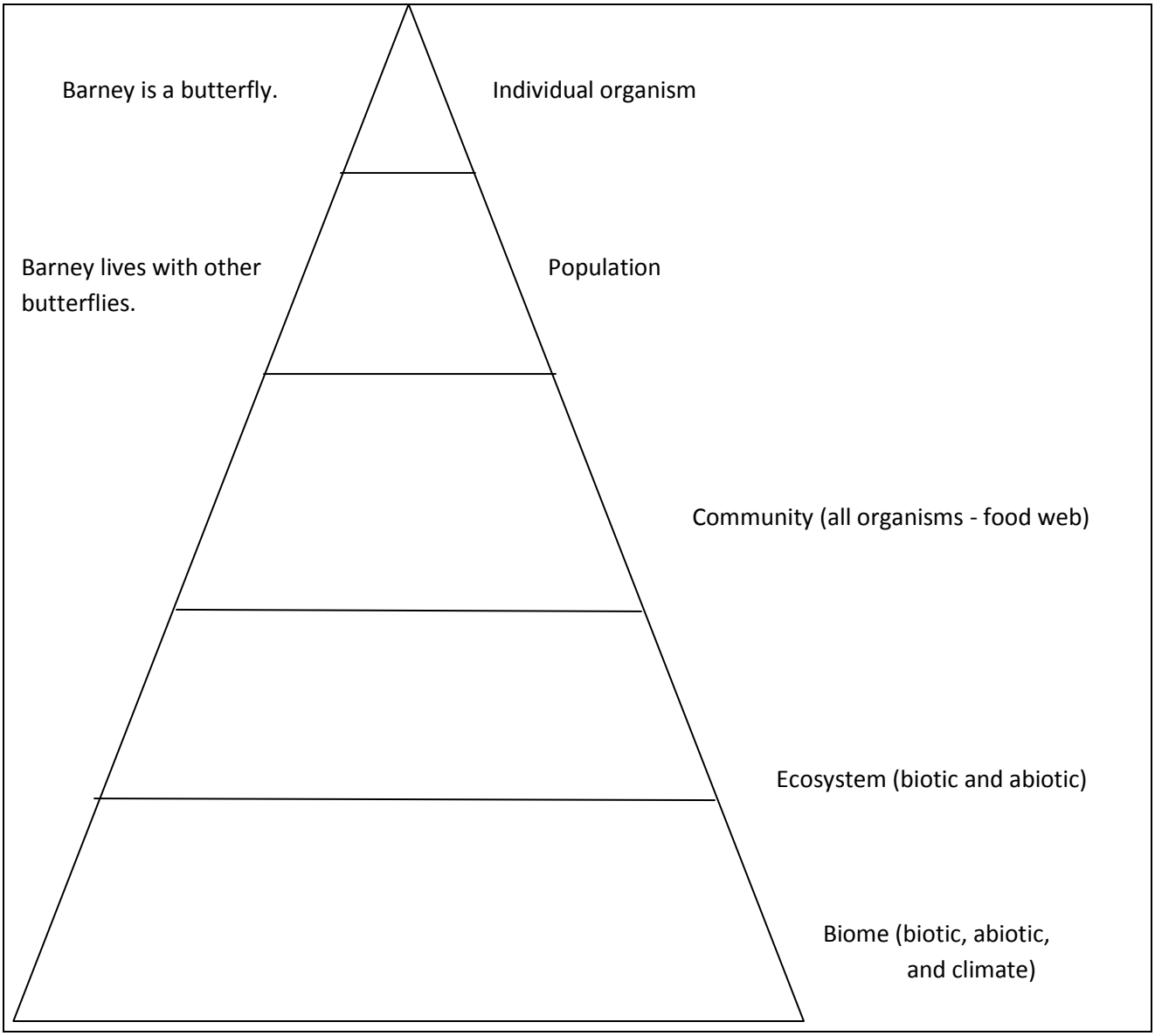
What is happening to our Bees?

Threats to Bees	Possible Effects	What can we do?

Or you may want them to complete a chart on adaptations.

Adaptation (structure or behavior)	Function

A-7


Barney is a butterfly.
Individual organism
Barney lives with other butterflies.
Population
Community (all organisms - food web)
Ecosystem (biotic and abiotic)
Biome (biotic, abiotic, and climate)