MONARCHS: METAMORPHOSIS, MIGRATION, MIMICRY AND MORE
KINDERGARTEN-SECOND

Life Science TEKS

Kindergarten: K.9A, K.9B, K.10B, K.10

First Grade: 1.9A, 1.9B, 1.9C, 1.10A, 1.10C, 1.10D

Second Grade: 2.9A, 2.9B, 2.9C, 2.10A, 2.10C

Life Science Vocabulary

adaptation, adult, animals, basic needs, chrysalis, egg, environment, exoskeleton, food, food chain, inherited, insect, interdependence, larva, learned, life cycle, living, metamorphosis, migration, mimicry, molt, nymph, offspring, organism, pupa, relationships, reproduce, shelter, survival, water

Pre-Show Activity

Pre-Show Lesson: Metamorphosis

Post this question on the board: "What is an insect's life like?"

Materials:

Per group: an insect in a clear container or an insect picture

Per student: set of beetle metamorphosis cards - one of each stage

Procedure:

1. Pretend that you have a pet insect. This can be any insect that you find outside. Introduce him to your students. Example, "This is Barry. He is my pet beetle. One day I was sitting outside reading a book and Barry came up to me. He hopped on my book and looked right at me. I started reading out loud and Barry just sat there and listened. So, I decided to take him home with me and keep him as a pet. I had to do some research to figure out how to keep Barry alive. What kind of food does he eat? What kind of habitat does he live in?"

2. Tell students that you brought some of Barry's friends to visit. Give each group an observation jar with an insect in it. Choose insects that go through complete metamorphosis

like an ant, bee, butterfly or beetle. If you cannot get insects, give them a picture of an insect. Ask students to talk in their groups about the life of that insect. How was it born? Where did it live? What changes did it go through? How old do you think it is? What does it eat? How does it protect itself from predators?

3. Show a video of complete metamorphosis and also a video of incomplete metamorphosis. The Discovery Education site has many videos on this, or you can try TeacherTube.

Another option is to read a book which explains both types of metamorphosis. A wonderful book which shows many examples of both life cycles is called, *Insect Metamorphosis: From Egg to Adult* by Ron and Nancy Goor.

4. The teacher will create a complete metamorphosis diagram on large chart paper. Students will copy this into their science notebooks. (Appendix A-1)

5. Discuss with students what complete metamorphosis is. You will want to introduce the stages by drawing one picture at a time for the insect that you have chosen. If you have actual examples of each stage, that would be ideal! The Museum sells these in the gift shop. Discuss the characteristics of each stage.

Egg - organism is developing

Larva - often worm like, molts several times, eats a lot

Pupa - does not eat or move much, changing internally

Adult - does not molt or grow, usually forms wings

6. Give each student a set of cards, each with a different stage of metamorphosis on it. You can find pictures of each stage on the Internet, or have students create their own set of cards using index cards. Ask students to put them in order and complete the cycle. (Appendix A-2)

Enrichment:

For younger students, the teacher will say a stage, and the students will act out the part. The first time you do this, you may want to go through it all together. Say, “Let’s use our bodies to show what metamorphosis looks like. First, we will be eggs. Everyone sit on the floor and curl up like an egg. Next, we will become caterpillars. Stretch yourself out and wriggle like a worm. After that, stand with your arms crossed across your chest as if you were all wrapped up in a chrysalis hanging from the underside of a leaf. Finally, stretch your arms out and flutter like a butterfly drying its wings. Now you are ready to fly.”

For older students, the teacher will say a characteristic of a stage, and students will hold up the card that matches it. Examples of this are, “The stage after larva”, “In this stage, the insect

develops wings", "The stage when the insect will reproduce." or "The chrysalis stage for the butterfly".

7. Read *A Very Hungry Caterpillar* by Eric Carle. When you finish reading, have kids fill out a life cycle diagram. This can be drawn on a new page in their science journal. With younger students, you may need to complete this as a class.

Post-Show Enrichment Activities

Activity One: Butterflies

Read *The Important Book* by Margaret Wise. Have kids make an important book about butterflies: "The important thing about butterflies is…" Each page should show/tell something important that they learned about butterflies from the museum presentation.

Activity Two: Camouflage

Give each student a picture of a butterfly to color. (Butterfly picture included on next page.) Tell them that they are going to color their butterfly and try to hide it somewhere in this room. It has to land on a flat surface and cannot be hidden under or inside anything. Predators are going to try to find your butterfly. Think about where you want your butterfly to land, and how you might color it to help it hide from predators. (Appendix A-3)

When students have finished coloring their butterflies, send one group out (the birds), and have the others tape their butterfly against the wall somewhere. Predict with students which butterflies they think will get captured first and why. Have the birds come in and eat as many butterflies as they can in 30 seconds. Debrief with the kids. What could they do to better camouflage their butterflies? Repeat with another group as predators. You may want to give the kids time to color the back of their butterfly to see if they can improve their butterfly's chance of survival.

Activity Three: Mimicry

Ask students, "Who knows what mimicking is? Remember we learned about this from our presenters." How many of you have ever gotten mad at someone for mimicking you or copying you? Explain that in nature, mimicry is a matter of survival for some species. Tell students that the Viceroy butterfly is very tasty. Hold up a cracker to represent the Viceroy. You may want to look for butterfly shaped crackers at the grocery store. Ask students what some natural predators of butterflies are (lizards, birds, bats, spiders, praying mantis, frogs, etc.). Have students chose a predator that they are going to represent. Give each student a "Viceroy Butterfly" cracker (mimic). Ask students, "How does it taste?" Next, tell students that you are going to give them another cracker. This time, the cracker represents a Monarch (model). Ahead of time, put vinegar on these crackers. Give them to the students along with a napkin so they can spit it out. Ask students, "How does it taste?" In our model, you could smell the vinegar, but in the real world, a Monarch does not smell different from a Viceroy, it

just tastes different. Monarchs are poisonous and can make a predator sick. Ask students to turn to their partner and explain why it would be a good idea for the viceroy to look like the monarch. “How does mimicking the monarch help the viceroy?”

Caution - some students have food allergies. Also, if food items are discouraged at your school, you could use butterfly cutouts that look the same. Put a smiley face on the back of one and a frown on the back of the other. Students will just turn them over and by chance see if they get to eat or not. If they get a smiley face, they can rub their stomachs to show they are happy and well fed. If they get a face with a frown, they will pretend like they are sick.

For older students, discuss other examples of mimicry from the presentation.

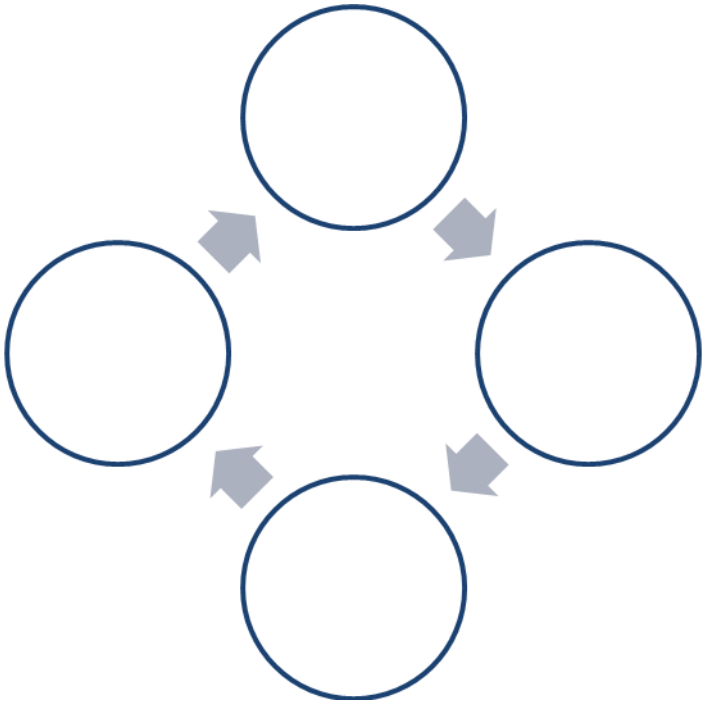
Bright red/yellow is a warning color
Caterpillar that looks like bird poop
Butterfly with owl eyes on its wings

Create a T chart with your examples. (Appendix A-4)

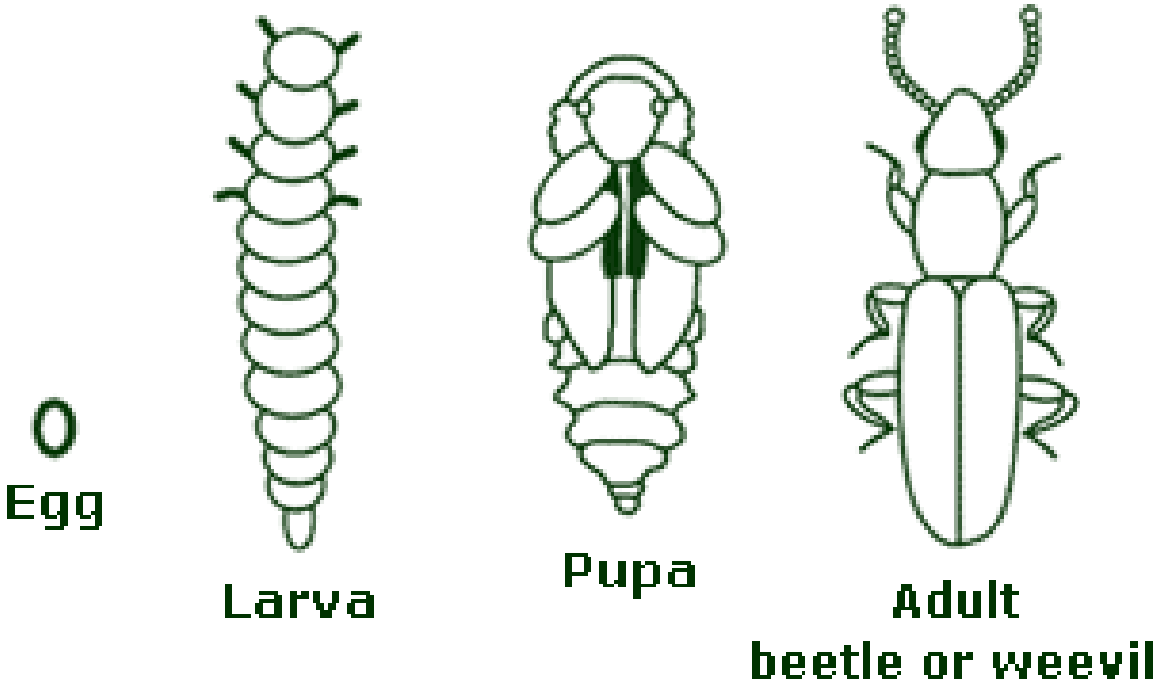
Appendix

A-1

The Life Cycle of a ___beetle_____

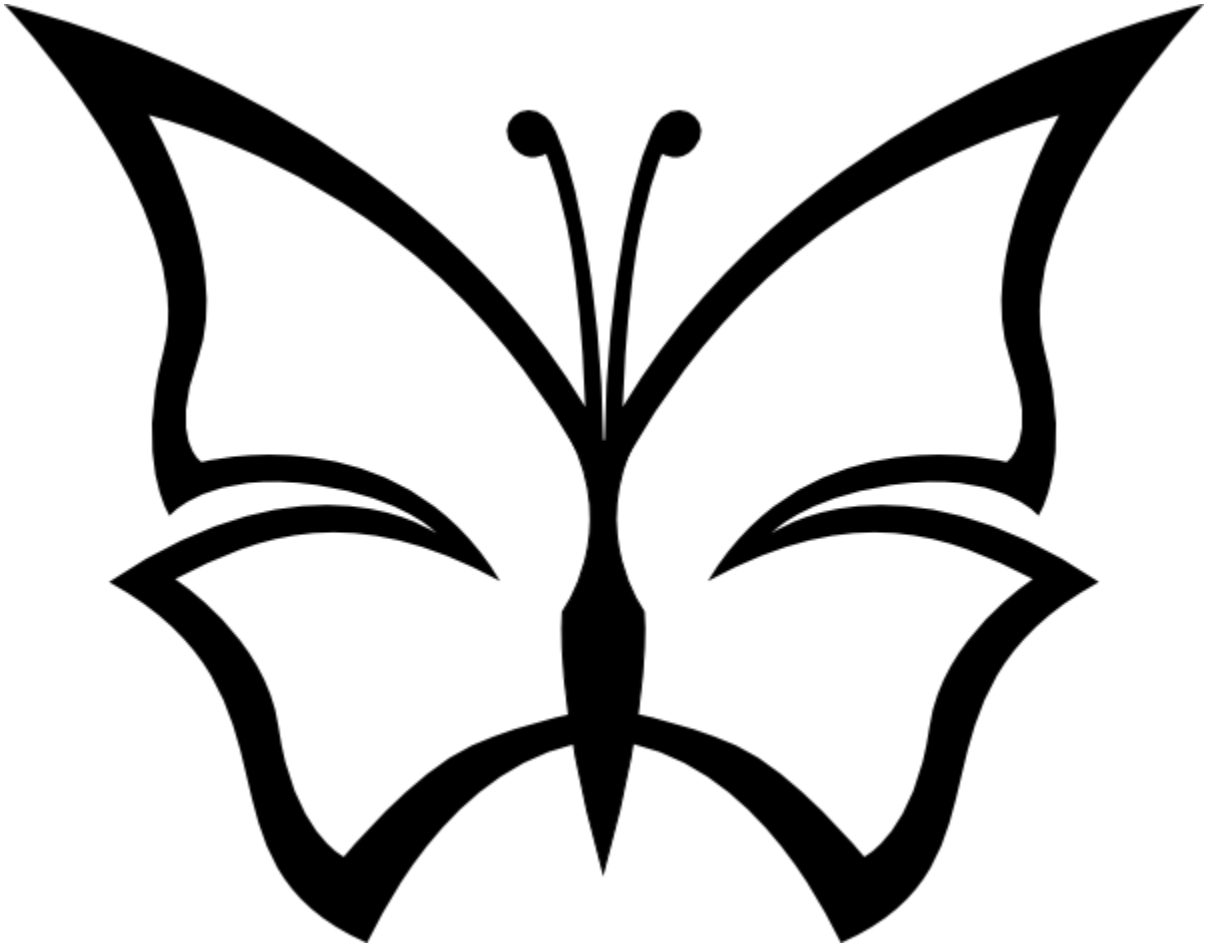


A-2



Graphic Source: grainscanada.gc.ca

A-3



Graphics Source: blackwhiteclipart.blogspot.com

A-4

Mimic	Model