

**GRADE LEVEL:**

PK-3

**DURATION:**

30 minutes

**NGSS STANDARDS:**

3-LS1-1

Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, death.

**NE STANDARDS:**

SC1.6.2.D

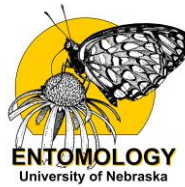
Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents

**VOCABULARY**

- Metamorphosis
- Egg
- Larva
- Caterpillar
- Molting
- Chrysalis
- Pupa
- Adult
- Life cycle

**MATERIALS:**

- Popcorn seeds
- Rotini pasta
- Shell pasta
- Bowtie pasta
- Paper with butterfly outline
- Crayons
- Glue
- Large pictures of life stages
- Labels of life stages

**INSECT LIFE CYCLE****BACKGROUND:**

In this lesson, students will learn about the life cycle of Insects with complete metamorphosis. The lesson will illustrate that animals can go through major changes as they grow and develop. Some insects (like butterflies, but also beetles, flies, and bees) develop by complete metamorphosis with 4 life stages: egg, larva, pupa, and adult.

**OBJECTIVES:**

- Student will model the life cycle of an insect with complete metamorphosis

**METHODS:**

Assess prior knowledge of insects and their development

- **“Raise your hand if you can think of an insect. Can anyone think of ways that insects are different from you or me?”** Call on several students; discuss their insect and characteristics that are unique to insects (six legs, 1 pair of antennae, 3 body segments- head, thorax, abdomen). Label insect structures on butterfly line drawing. Clear up misconceptions about what is or is not an insect as students may list spiders, worms, or centipedes/millipedes.
- **“One way that insects are different from us is the way they change as they get older. They go through a process called metamorphosis. Can anyone tell me what metamorphosis is?”** Let students provide their definitions.

Introduce concept of insect’s life cycle as metamorphosis

- Write metamorphosis on the board and use pictures of egg, larva, pupa, adult to discuss that **“Metamorphosis is a series of big changes occurring during growth and development.”**
- **“We notice a pattern of development in insects like butterflies, beetles, flies, and bees. They all develop by *complete* metamorphosis.”** Introduce the life cycle of the butterfly: egg, larva, pupa, adult. Have students label the pictures with the correct life stage.
- **“What changes happen during the life cycle of a butterfly?”** Discuss differences in locomotion (legs and wings), mouthparts, level of activity, size, etc.
- Egg: no visible legs or mouthparts, lack of movement and activity
- Larva (Caterpillar): chewing mouthparts and 6 walking legs, movement and feeding, molting (shedding of skin), butterfly forms chrysalis prior to pupation
- Pupa: no visible legs or mouthparts, no feeding or walking, chrysalis hangs changes color, big transformation happening inside
- Adult: sucking mouthparts, 6 legs, 4 wings in butterflies, able to walk or fly, feeds and reproduces, cycle starts over again with eggs

Introduce the activity

- **“Our activity today is to model a butterfly’s life cycle using the materials I brought today.”** Show students the example. Provide paper and crayons for students to draw the habitat for each life stage. Explain that they can use the 4 different materials to represent the egg (the popcorn seed), larva (rotini pasta), pupa (shell pasta), and adult butterfly (bowtie pasta). Have students attach the pasta with glue to their picture and label each life stage.

Wrap up

- Review: Give students time to discuss the following questions with a partner.
  - **What is metamorphosis?** (A series of big changes happening during growth and development)
  - **What are the stages of the butterfly life cycle?** (Egg, larva, pupa, adult)
  - **What other insects go through metamorphosis?** (Flies, beetles, butterflies and moths, ants, bees, and wasps)

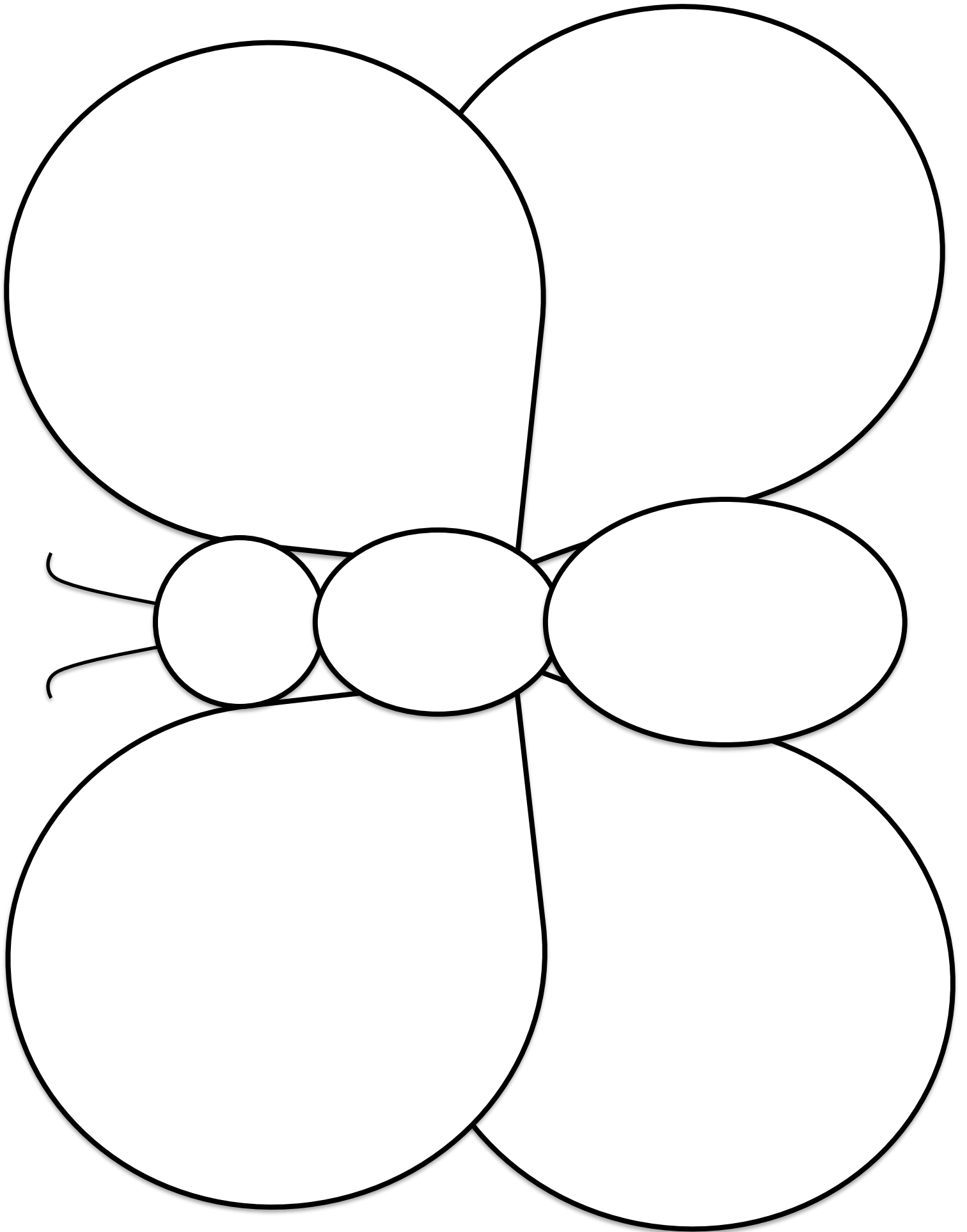
### **LESSON EXTENSION:**

Videos, photographs, additional info

1. <http://www.monarchwatch.org>
  - Monarch Watch, this one has it all!! Rearing kits, migration maps, life cycle posters, lots of information, free milkweed for your school garden, and ways to get involved in monarch conservation!
2. <http://www.monarchlab.org/mitc/>
  - University of Minnesota website on Monarchs in the Classroom including teacher resources, quizzes, pollinator garden instructions, and more.
3. <http://www.arkive.org/monarch-butterfly/danaus-plexippus/>
  - Resource with pictures, additional information, great videos of egg hatch, larva eating, pupation, and adult emergence (no narration)
4. <http://artsedge.kennedy-center.org/multimedia/VideoStories/hobey-ford/hobey-ford-butterfly.aspx>
  - Video of puppeteer, Hobe Ford, animating the life cycle of the monarch

Purchase live insects

1. Monarch Watch <http://shop.monarchwatch.org>
2. Shady Oak Farm <http://www.butterfliesetc.com/butterfly-eggs-caterpillars-and-chrysalises-2>



Egg

Larva

Pupa

Adult