Butterfly Bonanza

Grade level: 4-6

Unit of study: Life Cycles

MI Grade Level Content Expectations:

- Inquiry Process

S.IA.E.1 Inquiry includes an analysis and presentation of findings that lead to future questions, research, and investigations.
S.IA.01.12 Share ideas about science through purposeful conversation.
S.IA.01.13 Communicate and present findings of observations.

- Life Science: Organization of Living Things, Evolution, Ecosystems

L.OL.E.2 Life Cycles- Plants and animals have life cycles. Both plants and animals begin life and develop into adults, reproduce, and eventually die. The details of this life cycle are different for different organisms.
L.OL.01.21 Describe the life cycle of animals including the following stages: egg, young, adult; egg, larva, pupa, adult.
L.OL.E.1 Life Requirements: organisms have basic needs (food, water, shelter, space)

Key concepts: Metamorphosis, life cycles, life requirements

Resources & Materials needed:
-Computers
-Craft supplies
-Shoe boxes
-Aquarium
-Butterfly eggs

Abstract: In this lesson students will become familiar with the life cycle and life requirements of the monarch butterfly. They will be able to successfully explain the egg, larva, pupa and adult stages. Students as groups will act out the stages of a butterfly's life cycle. They will create a butterfly tank in which they will be able to first handedly observe the metamorphosis of a butterfly over time.

Big Ideas: All butterflies have "complete metamorphosis." To grow into an adult they go through 4 stages: egg, larva, pupa and adult. The first stage in every butterfly's life cycle is the egg stage. The female butterfly will lie anywhere from tens to thousands of eggs on the undersides of specific plants. Monarch butterflies lay their eggs on the underside of milkweed plant leaves. The female monarch will only lay a single egg on each milkweed plant and are only about the size of the head of a pin. It takes 3-8 days to develop into a caterpillar or larva, the next stage in the life cycle. In this stage of the monarch's life its goal is to eat and grow for the next 10-14 days. The monarch caterpillar grows almost 2000 times its original size during this period of time. After hatching from its egg the monarch caterpillar consumes the remnants of its egg. Once the egg is gone the caterpillar moves on to eating the leaves of the milkweed plant it was hatched on. This is the only type of plant the monarch caterpillar will eat. The leave of the milkweed plant contain toxins that the monarch caterpillar will retain for the rest or their lives and give them a defense mechanism against predators. Monarchs go through 5 instars as they grow. An instar is when the caterpillar has grown too large for its skin and it sheds it, eats it, and grows another one. Once the caterpillar has finished growing it forms itself into a chrysalis or pupa. This is where the real metamorphosis begins to happen. The tissue, organs, and limbs of the caterpillar begin a rapid transformation into an adult butterfly. This process takes between 10-14 days. Pupae can be found hanging from branches. They are extremely well camouflaged as this is their

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only means of defense at this stage in life. After metamorphosis is complete the pupa breaks open and the fully transformed adult butterfly emerges. The adult butterfly begins to flap its wings getting them ready and within 3-4 hours they are able to fly and already in a search of a mate. The adult's purpose is to mate, reproduce, and lay eggs so the whole cycle can start all over again. Adults in the summer generations live 2-5 weeks, and generations from the late summer and fall can live 8-9 months. Different generations of adult monarchs have different migration destinations than others causing this difference. Those in the later summer and fall must migrate all the way to Mexico during the winter months to reproduce.

Further information can be found at:

http://www.monarch-butterfly.com/

http://www.teachertube.com/viewVideo.php?video_id=292577

Activities:

Introduction: Butterfly Research

1. Explain to students that butterflies go through a life cycle known as metamorphosis in which they go through four stages egg, larva, pupa, and adult. They will specifically be researching monarch butterflies.
2. Divide the class into these five groups:
    a. Life cycles/metamorphosis
    b. Egg
    c. Larva
    d. Pupa
    e. Adult
3. Each group will be responsible for conducting research and becoming experts on their assigned topic. They will be responsible for identifying the processes which occur during each stage, basic life requirements needed, where it occurs, and possible threats etc.

Main Activity (Take it Outside!): Metamorphosis Play

1. Instruct students they must use their expertise on the topics they researched to develop a play which conveys all the information they learned to the rest of their classmates.

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2. Allow students time to organize their information into play form and practice. Groups can work together to form transitions between stages.
3. Have the life cycle/metamorphosis group perform first, and then follow in correct order of metamorphosis.

Conclusion: Butterfly Dioramas

1. Now that students have taught one another the stages of butterfly metamorphosis, students must individually create an informational diorama depicting the stages.
2. Ask students to bring in a shoe box from home to create their diorama in.
3. Provide them with craft materials and allow them collect materials from outside to use (sticks, leaves, rocks etc.).
4. Inform students they will need a visual representation and a short description of each stage of metamorphosis.
5. Have students display their finished projects around the classroom.

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