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The Baltimore Checkerspot Life Cycle

Like other butterflies, a Baltimore checkerspot undergoes complete metamorphosis. In June or July, adult females lay clusters of between 100 and 700 eggs on the underside of leaves of white turtlehead, a plant that occurs naturally in wet meadows and along stream banks. The larvae hatch and create a web nest using silk strands spun from spinnerets located near the mouthparts. They actively feed on turtlehead leaves through late summer. They remain on the plants until the first freeze (even though no longer actively feeding) and then seek shelter in the leaf litter through the winter. Those that survive the winter become active again in late spring. They feed on the leaves of other plants including English plantain and beardtongue. They pupate for two weeks and emerge as butterflies. The cycle begins again!

Checkerspot Life Cycle Board Game: The Life Cycle of the Baltimore Checkerspot Butterfly

Description: Students take turns and try to make their way through the entire butterfly life cycle. See gameboard in the Appendix (pg. 22). For a fun twist, enlarge the game spaces so that the students can play a giant version of the game in the classroom or on the playground.

Zap

Directions:

1. Discuss the life cycle and each life stage of the Baltimore checkerspot with your class.
2. To begin, have students roll up into an egg.
3. Use a magic (silly) word like “Zap” as a cue for students to change into a butterfly larva or caterpillar. In this form, they should move around however they think a caterpillar might move.
4. Use your magic word again to zap them into the pupal stage. In this stage, they hold their hands together over their heads to represent the silk that holds the chrysalis to its support and wiggle around while remaining in the same place. Chrysalis wiggle but cannot move from one place to another.
5. Next, zap them into the adult butterfly stage. Prompt them through a brief wing drying stage. Then let them move as they imagine a butterfly would.
6. Many won’t expect to be “zapped” again after becoming an adult butterfly. Zap them again and see how many understand that the cycle begins anew.
7. Continue zapping as long as you see fit or until the students tire of it.
Anatomy of a Butterfly

The Baltimore checkerspot, like every butterfly species, is an insect. Insects are categorized by having three body parts (head, thorax and abdomen) and three pairs of legs that are attached to the thorax.

The thorax, which is comprised of three body segments, contains much of an insect’s musculature and enables the insect to move from place to place. Along with the legs, an insect’s wings are also attached to the thorax. Only adult insects have fully formed and functional wings. Winged insects typically have two pairs of wings, each attached to a segment of the thorax. Only true flies have a single pair of wings (i.e. house fly, horse fly, mosquito). Many other insects that have “fly” in their common names are not true flies and have two pairs of wings (i.e. dragonflies, butterflies, mayflies, fireflies, to name a few).

The head of an insect sports the antennae, eyes and mouthparts. Antennae act as insect sensory zones. Insects can hear, smell, taste and feel with their antennae.

There are two types of insect eye. Compound eyes look like dimpled golf balls and detect distinct, though blurry, images. Simple eyes distinguish only changes in light patterns.

Insects have varied mouthparts. Houseflies have sponge-like mouthparts for swabbing up partially digested food scraps. Mosquitoes have needle-like mouthparts for injecting anti-coagulants into and sucking blood from unfortunate and unwilling donors. Grasshoppers and mantises have chewing mandibles for masticating plants or animal prey. Butterflies have long straw-like mouthparts that curl up when not in use. Butterflies unfurl their mouthparts and stick them into flowers to efficiently remove the sweet nectar inside.

The abdomen contains most of an insect’s major organs for circulation, respiration and digestion. Spiracles – small holes along the side of the abdomen – allow air to move in and out of an insect’s body.

The reproductive organs are also found in the abdomen. Ovipositors, or egg-layers, are among the best-known features of many insects. The stingers of bees, wasps and ants; the long swords of crickets and katydids; and the long, streaming threads of the ichneumon wasp are all modified ovipositors.

Butterfly Body Part Puzzle

Directions:

1. Sketch the major body parts of a butterfly on a piece of poster board. Include the head, thorax, abdomen, four wings and antennae.
2. Cut the body parts out.
3. Use these parts as stencils for making enough cut outs for every student or one for each group of students.
4. Use the stencils to draw a matching outline for each puzzle on a second piece of poster board.
5. Introduce these puzzles to your students during an introductory or review lesson on insects.
6. Students can complete the puzzle pieces by drawing compound eyes, adding a curled-up pipe cleaner mouth, attaching six pipe cleaner legs to the thorax, and decorating the wings, abdomen and thorax. (If you prefer – or to save time – you can do these steps yourself.)
7. To conclude the activity, have students put the puzzle together by placing each body part in the proper place on the outline as you present it during the lesson.

Materials:
Poster board
Markers
Scissors
Pipe cleaners

Level:
Primary and Early Intermediate
**Butterfly Senses**

**Smell:** Butterflies find nectar sources using scent and sight. Butterflies are near-sighted. Scent is the main sensory means by which they find distant flowers. They smell using sensory hairs on their antennae and, in many species, on their front legs. These “brush feet” help female butterflies identify proper caterpillar food plants. The following table details the caterpillar food preferences of selected butterfly caterpillars.

**Sight:** Butterflies have several eyes. Two are complex compound eyes that see images in color. Compound eyes contain many facets or ommatidia. Butterfly eyes contain from 2,000 to 27,000 facets. Each facet sends visual images to the brain where they are condensed into a single, slightly fuzzy image. Insects with compound eyes are nearsighted but can quickly detect slight movements.

Butterflies also have simple eyes that cannot see images but can recognize changes in light patterns. Butterfly larvae (or caterpillars) have only simple eyes.

**Taste:** Butterflies taste plants using their brush feet, antennae or small, antennae-like mouth parts called palps. These structures allow them to identify proper food sources for themselves or their young.

With some exceptions, butterfly caterpillars typically feed on plant leaves and stems. Most butterflies feed on nectar from flowers and some can digest pollen. Butterflies pollinate many species of plants. Other butterfly food sources include fruits, animal droppings and carrion. Butterflies frequently gather on muddy stream banks to extract nutrients from the moist soil. This behavior is called puddling.

<table>
<thead>
<tr>
<th>Typical Food Plants of Selected Butterfly Caterpillars</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Butterfly</strong></td>
</tr>
<tr>
<td>Baltimore checkerspot</td>
</tr>
<tr>
<td>Sulfurs</td>
</tr>
<tr>
<td>Spicebush swallowtail</td>
</tr>
<tr>
<td>Question mark</td>
</tr>
</tbody>
</table>

**Hearing:** The sensitive hairs on a butterfly’s antennae detect sound waves.

**Touch:** The sensitive hairs on the antennae and feet provide butterflies with their sense of touch.
**Scent & Flower activity**

**Description:**

1. Saturate cotton balls with various scents.
2. Fill film canisters with saturated cotton balls.
3. Attach canisters to flowers.
4. Spread flower canisters throughout room or playground.
5. Hand each student a canister.
6. Students smell their individual canisters and must remember that smell.
7. Students then sample the flower canisters, trying to locate the flowers with their scent.
8. Older students can note on the index card map where they found their flowers.

**My Egg-laying Plant Looks Like…..**

**Directions:**

1. Divide class into groups of seven or less.
2. Have students collect a variety of leaves from schoolyard or nearby natural area and bring them back to collective work area (beware of poison ivy).
3. Students should sort leaves by shape into piles.
4. (Optional) Students can try to identify the plants by leaf shape and research what types of caterpillars feed on each type of leaf.
5. (Optional) Students can graph the number of leaves found for each distinct shape.
6. Each student becomes a butterfly and describes for the group the leaf shape of the plant that its caterpillar feeds on.
7. The rest of the group tries to guess the leaf that the butterfly is describing.
8. The next butterfly describes a new leaf and the group guesses. This continues until all have participated.
9. (Optional) Students are each given a leaf from the leaf piles to hold behind their backs. Without looking at their leaves, they have to guess which leaf they have by feeling the shape and texture.
**Hearing Without Ears**

**Directions:**
1. Students separate into pairs.
2. Student #1 closes his/her eyes and holds onto a taut string. (The string represents a hair on an antenna.)
3. Student #2 vibrates the string gently.
4. Student #1 raises his/her hand if he/she feels string vibrating. (Tiny, sensitive hairs on a butterfly’s antennae sense vibrations created when a sound is made.)
5. Alternate method: have student #2 wave a fan while student #1 is blindfolded. The fan creates vibrations in air. Student #1’s body hairs should sense that air movement. Student #1 raises hand when he/she feels the air moved by the fan.

**The Eye’s have it!**

**Directions:**
1. Discuss butterfly sight with students.
2. Have students look through a kaleidoscope and through wax paper.
3. Assign students a simple task like putting a string through a paper clip and ask them to complete the task while looking through each object.
4. Have students evaluate the ease with which they performed the task each time.
5. Have students write a short paragraph or draw a picture that describes what they saw through the two mediums.
6. Discuss with the students which medium represents the compound eye and which represents the simple eye of an insect.
7. Point out that while students saw multiple images through the kaleidoscope, an insect’s brain processes the information from the multiple images to create one image.

**Flower Search Game**

(Visual Flower Search: When butterflies get within a few feet of nectar flowers, they locate them by sight.)

**Directions:**
1. Students make flowers from colored construction paper.
2. Collect the flowers and place a picture of a predatory insect or spider on a few of them.
3. Spread flowers out in a grassy area.
4. Assign each student a color.
5. When you say “go,” students must find and take as many flowers of their color as possible (“Taking” symbolizes the draining of nectar.)
6. Gather students together. How many flowers did each student collect? How many student-butterflies “survived”?
7. How many students had a predatory insect picture on their flowers? Those that did were eaten while collecting their food.
8. (Optional) Play one or more rounds and graph the results. (Each round represents another year in the butterfly life cycle.)

**Materials:**
- Yarn or string
- Fan or piece of cardboard

**Level:**
All

**Materials:**
- Plastic see-through kaleidoscopes
- Wax paper

**Level:**
All

**Materials:**
- Construction paper
- Markers

**Level:**
Primary
Butterfly Color Patterns

Every species of butterfly has its own beautiful coloration that serves to identify it. Individual butterflies recognize members of their own species by the brightly colored patterns on the topside of wings. Through such visual identification, butterflies can attract mates and recognize potential rivals.

Tiny, pigmented scales create the colorful patterns on every butterfly wing. Be careful when handling a butterfly because these scales easily rub off.

Many butterflies can be sorted easily into groups by looking at wing colors and wing shape (see table below). Observers usually must recognize subtle differences in wing size, pattern and shape in order to catalog by species. As an example, monarchs, admirals, painted ladies, buckeyes, viceroy, wood nymphs and morning cloaks have wings of roughly similar size and shape but with distinctive enough color patterns to allow for easy identification.

<table>
<thead>
<tr>
<th>Butterfly Group</th>
<th>General Description (but not foolproof)</th>
<th>Abundance</th>
<th>Relative Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfurs</td>
<td>Yellow wings</td>
<td>Common</td>
<td>Medium</td>
</tr>
<tr>
<td>Whites</td>
<td>White wings often with black spots</td>
<td>Common</td>
<td>Medium</td>
</tr>
<tr>
<td>Fritillaries</td>
<td>Brown with black checker-spot patterns</td>
<td>Common</td>
<td>Medium to Large</td>
</tr>
<tr>
<td>Swallowtails</td>
<td>Black, white or yellow wings</td>
<td>Common</td>
<td>Large</td>
</tr>
<tr>
<td>Angle-wings</td>
<td>Usually orange and black wings</td>
<td>Common</td>
<td>Medium</td>
</tr>
<tr>
<td>Blues</td>
<td>Blue or brown wings</td>
<td>Common</td>
<td>Small</td>
</tr>
<tr>
<td>Skippers</td>
<td>Brown or orange wings</td>
<td>Common</td>
<td>Small to Medium</td>
</tr>
</tbody>
</table>

In many cases (the most famous being the monarch butterfly, but also the Baltimore checkerspot), bright wing patterns warn predators that the butterflies taste bad. The chemicals that protect these butterflies are usually incorporated into the body during the larval or caterpillar stage. The caterpillar feeds on a plant species that produces a toxin and incorporates the toxin into its own body. The toxin remains in the body throughout metamorphosis. Some non-poisonous species have patterns similar to those of a toxic species. Through pattern mimicry, they are able to fool predators into believing that they too taste bad.

Many butterflies have bold patterns on their upper wings and dull patterns on their under wings. Angle-wing butterflies like commas and question marks exemplify this. These species can be seen quite readily when in flight or when resting with their wings outstretched. But when one of these butterflies folds its wings back so that only the under wing is visible, the under-wing pattern blends in perfectly with the butterfly's surroundings. The effect of “melting into the background” is furthered even more by the angular shape of the wings, which mimics the outline of a dead leaf.
**Create a Butterfly Habitat Mural**

**Directions:**

1. Show pictures of typical butterfly habitats, which can include meadows, woodlands and wetlands.
2. Challenge your students to work together to reproduce their versions of these habitats on mural paper. You can let them work in small groups on small sections of paper that will later be taped together or work all together on the large mural. You may want to focus small groups on a single habitat.
3. Discuss how coloration helps butterflies survive.
4. Give each student two butterfly patterns, cut from the construction paper.
5. Instruct the students to create one butterfly with warning coloration and one with camouflage coloration.
6. Have students paste their butterflies in what they think would be the best spot on the mural.
7. Discuss their placement. Are the camouflage butterflies in a good place? Does it matter where the bright butterflies are?

**Blue Jays and Butterflies**

**Directions:**

1. Define boundaries for the activity. (Boundary size depends on number of participants.)
2. Explain the rules and then have students predict how many butterflies and blue jays they think will survive a round.
3. Choose one blue jay predator for every 8 students in class. Give each predator a red card or ribbon to identify them. The other students are butterflies – prey for the blue jays during the game.
4. Pass out a color square to each of the butterflies. Spread the color squares evenly throughout remainder of group. For every eight students, two students should get blue, two should get orange and two green.
5. Those given green cards will defend themselves through camouflage. When approached by a blue jay, they must freeze to remain safe. The butterfly is out if tagged while in motion and must give up its card to the predator.
6. Those with blue cards rely on speed and agility to avoid the blue jays. They must outrun (or out-fly) the blue jays to survive. The butterfly is out if tagged and must give up its card to the predator.
7. Those with orange cards protect themselves through warning coloration. They can flash their bright orange cards when a blue jay approaches. The blue jay can choose to tag them or not. If they tag a bright orange butterfly with no “M” on its card, the blue jay will become sick because this butterfly is poisonous. The jay has to sit for 30 seconds. The butterfly is out if tagged and must give up its card to the predator. If a bluejay tags an orange butterfly with an “M”, the blue jay will be fine because this butterfly is a mimic and is not poisonous. The butterfly is out and must give up its card to the predator.
8. When a blue jay tags a butterfly, it should take the butterfly’s colored card as proof of capture. The number of captured butterflies needed for the blue jays to survive the round depends somewhat on the number of participants, the skill of the blue jays or the prey and the size of the playing field but should be somewhere in the range of 3 – 5. If necessary, this can be adjusted between rounds to create a challenge for all parties.

9. The time limit for each round should be 2 to 3 minutes. At the end of the round, see how many butterflies and predators have survived the activity. These numbers can be graphed.

10. Play several rounds, with each student getting to play as many different roles as possible.

11. In conclusion, discuss the different defensive strategies used. Which was the easiest? Which was the hardest? Ask the predators which strategies made it more difficult to catch prey. Did they adopt new strategies to help them improve their chances of success?

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**Materials:**
- Poster board
- Construction paper or some other medium for a journal cover
- Magazine pictures of butterflies
- Drawing materials
- Paper
- Pencil
- Markers
- Scissors, Yarn or paper fasteners
- The Golden Guide to Butterflies

**Level:**
- Intermediate and Advanced

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**A Spring Butterfly Journal or Checklist**

**Directions:**

1. Have each student create his/her own butterfly journal. Use construction paper or some other heavy paper to create front and back covers. Decorate with a butterfly motif. Secure writing or drawing paper inside cover with yarn or paper fasteners.

2. Construct and hang a Class Butterfly Chart (decorated as you see fit) in a prominent place in the classroom.

3. Beginning in September or early spring when the days begin to warm, instruct the students to look for butterflies in the schoolyard. If they observe a new species of butterfly, they should describe it in their journal, sketch it, record the date and the weather and take notes on its behavior. When possible, they should look in a butterfly guide and try to identify the butterfly at least to general type (some groups of butterflies, such as skippers, are very difficult to identify to species).

4. Students observing a new schoolyard butterfly can record the sighting, including the observers, the date, the weather and the location, on the Class Butterfly Chart. Teachers may want to incorporate a rule that at least two students have to observe the butterfly and agree on the identification to record it on the class chart. In real field studies, the observation of a new species within an area usually needs to be substantiated by one or more experts to be properly validated.

5. Students can create charts denoting the various first appearances of species as spring progresses towards the end of the school year. Future classes can compare their charts to those of previous years to note changes in sightings of different species.
Habitat Loss

Like most threatened and endangered species, Baltimore checkerspot populations are in trouble because of drastic alterations to their habitat. The continuous development of wetlands areas reduces the amount of moist to wet habitats that provide suitable growing conditions for turtlehead plants. White-tailed deer, heavily overpopulated in many parts of the eastern United States, often out-compete checkerspot caterpillars for turtlehead leaves. Their depredations on turtlehead plants severely limit the food available to the growing caterpillars. All-terrain vehicle operators crush caterpillar food sources as they motor through suitable, but often fragile habitat. Pesticides, designed to combat gypsy moth and other insect pest infestations, take their toll on similar but harmless insect species like the Baltimore checkerspot.

Plant a Butterfly Garden

Directions:

1. Secure permission to plant somewhere on school grounds or in a nearby park, natural area or yard.
2. Research the food preferences of local butterfly and caterpillar species. (You should have no trouble finding butterfly gardening books.)
3. Research the food plants that grow easily within your area. The secret to a good butterfly garden is to plant a variety of nectar sources. It is important to provide some plants that bloom in spring, some summer flowers and some fall blossoms. Have a local garden club or plant nursery help with background research and plant selection (they may even donate seeds or plants). Plan to intersperse caterpillar food plants in between the nectar producers (some plants provide both services—butterflyweed and other milkweeds are good examples). The nectar blooms will initially attract the butterflies, which will then discover the caterpillar plants.
4. Purchase the seeds in fall or winter. Select plants native to the area. They are easier to maintain as they are adapted to the climate, soils and moisture regimes.
5. Start the seeds during the winter or early spring. Provide the recommended type of soil substrate for germination and growth. Provide the plants with the recommended amount of sunlight and moisture. Periodically fertilize and transplant the young plants as instructed.
6. Turn over the ground after the soil is workable in the early spring. Amend the soil with compost and/or composted manure (compost can be easily created in the classroom through the use of a well-maintained worm farm).
7. Transplant hardy seedlings right after the ground is workable. Transplant less hardy plants after the last frost date (usually early May in our region).
8. Mulch around plants for moisture, temperature and weed control.
9. Periodically water newly transplanted plants if nature isn’t doing it already. Feed plants as recommended. Think about using organic fertilizers like compost or fish meal or slow release fertilizers. These are the most environmentally sensitive ways to feed plants.
10. Construct a butterfly roosting box and erect it in the garden. Butterflies can rest there at night or during the heat of the day.

11. Arrange with students, groundskeepers or volunteers to occasionally stop by over the summer to weed and water the plot. Once most native plants are firmly established, they need minimal care.

12. Consider having your garden certified as a wildlife habitat by the National Wildlife Federation.

13. Your classes will enjoy the blooms for years to come!

**Virtual Butterfly Garden Design**

**Directions:**

1. Discuss the ingredients of a good butterfly garden (see above).

2. Older students make garden components out of fun foam and other craft materials. They create their own garden design by arranging their components on a square of flower arrangement foam.

3. Younger students can arrange pre-made components on the foam substrate.

4. The students then present their special arrangement to the rest of the class.

**Materials:**
- Flower arrangement foam
- Plastic flowers
- Fun foam
- Plastic fruit
- Gardening stakes or wire

**Level:** All
THE CHECKERSSPOT LIFECYCLE BOARD GAME

STANDARD: READING

Phonemic awareness
Students will:
• Decode words in grade-level texts (1A2)

Fluency
Students will:
• Read grade-level text accurately (1C2)

Vocabulary
Students will:
• Develop and apply vocabulary through exposure to a variety of texts (1D1)
• Develop a conceptual understanding of new words (1D2)

General Reading Comprehension
Students will:
• Develop comprehension skills through exposure to a variety of texts (1E1)
• Use strategies to make meaning from text (during reading) (1E3)

Comprehension of informational text
Students will:
• Develop comprehension skills by reading a variety of informational texts (2A1)
• Identify and use text features to facilitate understanding of informational texts (2A2)
• Develop knowledge of organizational structure of informational text to understand what is read (2A3)
• Determine important ideas and messages in informational texts (2A4)

STANDARD: MATH

Knowledge of Numbers and place value
Students will:
• Apply knowledge of whole numbers and place value (6A1)

STANDARD: SCIENCE

Constructing Knowledge
Students will:
• Gather and question data from many different forms of scientific investigations which include reviewing appropriate print resources, observing what things are like or what is happening somewhere, collecting specimens for analysis, and doing experiments (1A1)

Technology
Students will:
• Investigate a variety of mechanical systems and analyze the relationship among the parts (1D2)

Life Science:
Students will:
• Explain the idea that in any particular environment, some kinds of plants and animals survive well, some less well, and some cannot survive at all (3A1)
• Gather information and direct evidence that humans have different external features, such as size, shape, etc., but that they are more like one another than like other animals (3A2)
• Recognize food as the source of materials that all living things need to grow and survive (3E1)
• Explain that organisms can grow and survive in many very different habitats (3F1)
ZAP

Standard: Reading

Vocabulary
Students will:
• Develop and apply vocabulary through exposure to a variety of texts (1D1)
• Develop a conceptual understanding of new words (1D2)

Listening and listening comprehension
Students will:
• Demonstrate comprehension of various oral instructions, questions, and prompts (6A1)
• Demonstrate comprehension of vocabulary presented orally and in context (6A2)
• Comprehend and apply content information presented orally (6A3)
• Listen to and participate in conversations and discussions on a variety of subjects (6A4)

Standard: Science

Constructing Knowledge
Students will:
• Gather and question data from many different forms of scientific investigations which include reviewing appropriate print resources, observing what things are like or what is happening somewhere, collecting specimens for analysis, and doing experiments (1A1)

Communicating Scientific information
Students will:
• Develop explanations that explicitly link data from investigations conducted, selected readings and, when appropriate, contributions from historical discoveries (1C1)
• Make use of and analyze models, such as tables and graphs to summarize and interpret data (1C1a)
• Practice identifying the parts of things and how one part connects to and affects another (1C2)

Standard: Physical Education

Skillfulness
Students will:
• Demonstrate fundamental movement skills in every day experiences (6A1)
• Develop creative movement skills (6A2)

Butterfly Body Part Puzzle

Standard: Science

Constructing Knowledge
Students will:
• Gather and question data from many different forms of scientific investigations which include reviewing appropriate print resources, observing what things are like or what is happening somewhere, collecting specimens for analysis, and doing experiments (1A1)

Applying Evidence and reasoning
Students will:
• Review different explanations for the same set of observations and make more observations to resolve the differences (1B1c)
Communicating Scientific Information
Students will:
• Construct and share reasonable explanations for questions asked (1C1d)

Technology
Students will:
• Explain that a model is a simplified imitation of something and that a model’s value lies in suggesting how the thing modeled works (1D3a)

**Standard: Reading**

Vocabulary
Students will:
• Develop and apply vocabulary through exposure to a variety of texts (1D1)
• Use words to describe location, size, color, and shape (1D2a)

**Standard: English Language Proficiency**

Listening and listening comprehension
Students will:
• Demonstrate comprehension of various oral instructions, questions, and prompts. (6A1)
• Demonstrate comprehension of vocabulary presented orally and in context (6A2)
• Comprehend and apply content information presented orally (6A3)
• Listen to and participate in conversations and discussions on a variety of subjects (6A4)

**Scent and Flower Activity**

**Standard: Reading**

Fluency
Students will:
• Listen to models of fluent reading (1C1a)

Comprehension
Students will:
• Develop comprehension skills by reading a variety of informational texts (2A1)
• Use informational aids (2A2c)
• Develop knowledge of organizational structure of informational text (2A3)
• Identify and explain relationships between and among ideas (2A3f)

Vocabulary
Students will:
• Develop and apply vocabulary through exposure to a variety of texts (1D1)
• Use words to describe location, size, color, and shape (1D2a)

**Standard: Science**

Constructing Knowledge
Students will:
• Gather and question data from many different forms of scientific investigations which include reviewing appropriate print resources, observing what things are like or what is happening somewhere, collecting specimens for analysis, and doing experiments (1A1)
Applying Evidence and reasoning
Students will:
• Review different explanations for the same set of observations and make more observations to resolve the differences (1B1c)

Communicating Scientific Information
Students will:
• Construct and share reasonable explanations for questions asked (1C1d)

Technology
Students will:
• Explain that a model is a simplified imitation of something and that a model’s value lies in suggesting how the thing modeled works (1D3a)

My Egg Laying Plant Looks Like:

Standard: Science
Constructing Knowledge
Students will:
• Gather and question data from many different forms of scientific investigations which include reviewing appropriate print resources, observing what things are like or what is happening somewhere, collecting specimens for analysis, and doing experiments (3A1)

Communicating Scientific Information
Students will:
• Develop explanations that explicitly link data from investigations conducted, selected readings and, when appropriate, contributions from historical discoveries (1C1)
• Make use of and analyze models, such as tables and graphs to summarize and interpret data (1C1a)
• Practice identifying the parts of things and how one part connects to and affects another (1C2)

Life Science:
Students will:
• Recognize food as the source of materials that all living things need to grow and survive (3E1)

Standard: Reading
Vocabulary
Students will:
• Develop and apply vocabulary through exposure to a variety of texts (1D1)
• Develop a conceptual understanding of new words (1D2)
• Understand, acquire and use new vocabulary (1D3)

General Comprehension
Students will:
• Develop comprehension skills through an exposure to a variety of texts (1E1)
• Use strategies to make meaning from texts (during reading) (1E3)
• Use strategies to demonstrate understanding from texts (after reading) (1E4)

Standard: Math
Knowledge of Algebra patterns and functions
Students will:
• Identify, describe, extend, analyze or create non-numeric growing or repeating patterns (1A2)
**Standard: English Language Proficiency**

*Listening and listening comprehension*

Students will:
- Demonstrate comprehension of various oral instructions, questions, and prompts (6A1)
- Demonstrate comprehension of vocabulary presented orally and in context (6A2)
- Comprehend and apply content information presented orally (6A3)
- Listen to and participate in conversations and discussions on a variety of subjects (6A4)

**Hearing without Ears**

**Standard: Reading**

*Vocabulary*

Students will:
- Develop and apply vocabulary through exposure to a variety of texts (1D1)

**Standard: English Language Proficiency**

*Listening and listening comprehension*

Students will:
- Demonstrate comprehension of various oral instructions, questions, and prompts (6A1)
- Demonstrate comprehension of vocabulary presented orally and in context (6A2)
- Comprehend and apply content information presented orally (6A3)
- Listen to and participate in conversations and discussions on a variety of subjects (6A4)

**Standard: Science**

*Constructing Knowledge*

Students will:
- Gather and question data from many different forms of scientific investigations which include reviewing appropriate print resources, observing what things are like or what is happening somewhere, collecting specimens for analysis, and doing experiments (3A1)

*Communicating Scientific information*

Students will:
- Have opportunities to work with a team, share findings with others, and recognize that all team members should reach their own conclusions about what the findings mean (3A1D)

*Technology*

Students will:
- Examine and modify models and discuss their limitations (3D3)

**The Eyes Have It**

**Standard: English Language Proficiency**

*Listening and listening comprehension*

Students will:
- Demonstrate comprehension of various oral instructions, questions, and prompts (6A1)
- Demonstrate comprehension of vocabulary presented orally and in context (6A2)
- Comprehend and apply content information presented orally (6A3)
- Listen to and participate in conversations and discussions on a variety of subjects (6A4)
Standard: Reading

Vocabulary
Students will:
• Develop and apply vocabulary through exposure to a variety of texts (1D1)
• Develop a conceptual understanding of new words (1D2)
• Understand, acquire and use new vocabulary (1D3)

General Comprehension
Students will:
• Develop comprehension skills through an exposure to a variety of texts (1E1)
• Use strategies to make meaning from texts (during reading) (1E3)
• Use strategies to demonstrate understanding from texts (after reading) (1E4)

Standard: English Language Proficiency

Writing
Students will:
• Write to express personal information and ideas (4A1)
• Write to convey academic information (4A2)
• Use vocabulary to communicate effectively in writing (4A3)
• Use standard English grammar to communicate clearly and accurately in writing (4A4)
• Use the conventions of standard English to communicate clearly and accurately in writing (4A5)
• Compose texts using the steps of the writing process (4A6)

Standard: Science

Constructing Knowledge
Students will:
• Gather and question data from many different forms of scientific investigations which include reviewing appropriate print resources, observing what things are like or what is happening somewhere, collecting specimens for analysis, and doing experiments (3A1)

Communicating Scientific Information
Students will:
• Develop explanations that explicitly link data from investigations conducted, selected readings and, when appropriate, contributions from historical discoveries (1C1)
• Make use of and analyze models, such as tables and graphs to summarize and interpret data (1C1A)

Flower Search Game

Standard: English Language Proficiency

Listening and listening comprehension
Students will:
• Demonstrate comprehension of various oral instructions, questions, and prompts (6A1)
• Demonstrate comprehension of vocabulary presented orally and in context (6A2)
• Comprehend and apply content information presented orally (6A3)
• Listen to and participate in conversations and discussions on a variety of subjects (6A4)
**Standard: Science**

Communicating Scientific Information  
Students will:  
• Develop explanations that explicitly link data from investigations conducted, selected readings and, when appropriate, contributions from historical discoveries (1C1)

**Standard: Math**

• The student will model real world situations using the language of mathematics and appropriate technology (CLG1.2)

**Standard: Fine Arts**

Creative expression and production  
Students will:  
• Create images and forms from observation, memory and imagination (3.1)

**Standard: Physical Education**

Students will:  
• Practice fundamental movement skills (6A1)  
• Explore and experience skill themes (6A3)

**Create a Butterfly Mural Habitat**

**Standard: Fine Arts**

Aesthetic Observation  
Students will:  
• Identify and describe observed form (1A1)  
Creative Expression and production  
Students will:  
• Create images and forms from observation, memory and imagination (3.1)

**Standard: Science**

Constructing Knowledge  
Students will:  
• Gather and question data from many different forms of scientific investigations which include reviewing appropriate print resources, observing what things are like or what is happening somewhere, collecting specimens for analysis, and doing experiments (3A1)  
Communicating Scientific Information  
Students will:  
• Develop explanations that explicitly link data from investigations conducted, selected readings and, when appropriate, contributions from historical discoveries (1C1)  
• Make use of and analyze models, such as tables and graphs to summarize and interpret data (1C1a)
**Standard: English Language Proficiency**

*Listening and listening comprehension*

Students will:
- Demonstrate comprehension of various oral instructions, questions, and prompts (6A1)
- Demonstrate comprehension of vocabulary presented orally and in context (6A2)
- Comprehend and apply content information presented orally (6A3)
- Listen to and participate in conversations and discussions on a variety of subjects (6A4)

**Blue Jays and Butterflies**

**Standard: Physical Education**

*Social Psychological Principles*

Students will:
- Work effectively with others in a physical activity setting (3A2)
- Apply effective time management strategies (3A5)

*Skillfulness*

Students will:
- Demonstrate fundamental movement skills in daily movement experiences (6A1)
- Develop creative movement skills (6A2)
- Demonstrate proficiency in skill themes (6A3)

**Standard: Math**

- The student will demonstrate the ability to investigate, interpret and communicate solutions to mathematical and real world problems using patterns, functions and algebra (CLG1)

**Standard: Science**

*Skills and Processes Constructing Data*

Students will:
- Gather and question data from many different forms of scientific investigations which include reviewing appropriate print resources, observing what things are like or what is happening somewhere, collecting specimens for analysis, and doing experiments (3A1)

*Technology*

Students will:
- Examine and modify models and discuss their limitations (3D3)

**A Spring Butterfly Journal or Checklist**

**Standard: Reading/Language Arts**

*Writing*

- Compose texts using the prewriting and drafting strategies of effective writers and speakers (4A1)
- Use effective details, words, and figurative language in the student’s own composing (4A5)
- Locate, retrieve, and use information from various sources to accomplish a purpose (4A7)

*Grammar*

- Recognize examples of conventional usage in personal and academic reading (5B1)
- Comprehend and apply standard English usage in oral and written language (5B2)
**Standard: Science**

**Communicating Scientific Information**
- Develop explanations that explicitly link data from investigations conducted, selected readings and, when appropriate, contributions from historical discoveries (1C1)

**Life Science**
- Observe a variety of familiar animals and plants (perhaps on the school grounds, in the neighborhood, and at home) to discover patterns of similarity and difference among them (3A1)

**Standard: Math**
- The student will demonstrate the ability to investigate, interpret and communicate solutions to mathematical and real world problems using patterns, functions and algebra (CLG1)

**Plant a butterfly garden**

**Standard: Reading**

**General Reading process**
Students will:
- Develop and apply vocabulary through exposure to a variety of texts (1D1)
- Use strategies to make meaning from text (during reading) (1D3)

**Comprehension of informational texts**
Students will:
- Develop comprehension skills by reading a variety of self-selected and assigned informational texts (2D1)
- Identify and use text features to facilitate understanding of informational texts (2D2)
- Read critically to evaluate informational text (2D6)

**Listening**
Students will:
- Demonstrate active listening strategies (6A1)
- Comprehend and analyze what is heard (6A2)

**Standard: Science**

**Life Science**
Students will:
- Explain the idea that in any particular environment, some kinds of plants and animals survive well, some less well, and some cannot survive at all (3A1)
- Explain that organisms can grow and survive in many very different habitats (3F1)
- Recognize and describe that the activities of individuals or groups of individuals can affect the environment (6B1)
Virtual Butterfly Garden

Standard: Reading

General Reading process
Students will:
• Develop and apply vocabulary through exposure to a variety of texts (1D1)
• Use strategies to make meaning from text (during reading) (1D3)

Comprehension of informational texts
Students will:
• Develop comprehension skills by reading a variety of self-selected and assigned informational texts (2D1)
• Identify and use text features to facilitate understanding of informational texts (2D2)
• Read critically to evaluate informational text (2D6)

Listening
Students will:
• Demonstrate active listening strategies (6A1)
• Comprehend and analyze what is heard (6A2)

Speaking
Students will:
• Use organization and delivery strategies at an appropriate level (7A1)
• Make oral presentations (7A2)

Standard: Science

Life Science
Students will:
• Explain the idea that in any particular environment, some kinds of plants and animals survive well, some less well, and some cannot survive at all (3A1)
• Explain that organisms can grow and survive in many very different habitats (3F1)
• Recognize and describe that the activities of individuals or groups of individuals can affect the environment (6B1)

Standard: Fine Arts

Creative expression and production
Students will:
• Create images and forms from observation, imagination and memory (3.1)
APPENDIX

WEBSITES

http://www.butterflyrecovery.org/education/docs/BFCI_ActivityGuide.pdf
A butterfly activity guide compiled through the combined efforts of the National Wildlife Federation (NWF - Publishers of Ranger Rick and My Big Backyard magazines) and Association of Zoos and Aquariums (AZA). Contains activities suitable for grades K-8 and conservation project suggestions for grades K-12. Also contains useful background information and resource links.

http://www.zoobooks.com/newFrontPage/animals/virtualZoo/animals/b/butterflies/games.html
A virtual look at butterfly anatomy and life cycles. A short section with butterfly games is included on the site.

http://www.niagaraparks.com/nature/butterfly.php
An excellent information source on butterflies. The site includes discussions on butterfly anatomy, behavior and life cycles. A section on distinguishing between butterflies and moths is helpful. A word search activity is included.

BOOKS

For young children:
Deborah Heiligman and Bari Weissman (Illustrator), From Caterpillar to Butterfly (Let's-Read-and-Find-Out Science, Stage 1), HarperCollins Children's Books 1996, 36 pp

Butterfly identification:

Jeffrey Glassberg; Butterflies through Binoculars: The East: A Field Guide to the Butterflies of Eastern North America (Paperback); Oxford University Press 1999; 128pp

Paul A. Opler, Amy Bartlett Wright (Illustrator), Roger Tory Peterson (Series Editor); Peterson First Guide to Butterflies and Moths (Peterson First Guides®); Houghton Mifflin Company 1994; 242pp

Amy Bartlett Wright, Roger Tory Peterson (Series Editor); Peterson First Guide to Caterpillars of North America (Peterson First Guides®); Houghton Mifflin Company 1993; 128pp

All-purpose butterfly books:
Ernest Williams, Donald Stokes, and Lillian Stokes; Stokes Butterfly Book : The Complete Guide to Butterfly Gardening, Identification, and Behavior (Paperback); Donald W. Stokes and Lillian Q. Stokes 1991; 96pp

Robert Mikula; The Family Butterfly Book: Projects, activities and a field guide to 4o favorite North American species; Storey Books 2000; 166pp

Butterfly gardening books:
David Mizejewski; National Wildlife Federation Attracting Birds, Butterflies & Backyard Wildlife; Creative Homeowner 2004; 128pp

Marcus Schneck; Creating a Butterfly Garden (Paperback); Fireside 1993; 80pp
The Baltimore Checkerspot Life Cycle Game

**Start**
as a checkerspot egg.

<table>
<thead>
<tr>
<th>Warm dry weather—go ahead 3 spaces.</th>
<th>Curl up and pretend to be an egg!</th>
<th>Cold spell! Lose turn!</th>
<th>Egg hatches! Spin again!</th>
<th>Turtlehead! Good food! Move ahead 2 spaces!</th>
</tr>
</thead>
</table>

|-------------------------------------------------------------------------------|---------------------------|---------------------------|---------------------------------------------|----------------------------|

<table>
<thead>
<tr>
<th>Caterpillar sheds skin 4.</th>
<th>Young wasps catch a disease and die. Caterpillar lives. Don’t have to go back to Start!</th>
<th>Caterpillar sheds skin final time and pupates. Go ahead two spaces.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Dragonfly catches and eats butterfly. Go back to Start.</th>
<th>Let your wings unfold and fly free!</th>
<th>Butterfly emerges from chrysalis. Move ahead one space.</th>
<th>Deer mouse finds chrysalis and eats it. Go back to Start.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Curious student catches butterfly in net. Teacher encourages student to let butterfly free. Spin again.</th>
<th>Butterfly uses sensory hairs on front feet to locate a turtlehead plant.</th>
<th>Butterfly lays eggs on turtlehead plant. Go ahead one space.</th>
<th><strong>Finish</strong> Butterfly soon dies but the cycle continues as new caterpillars hatch.</th>
</tr>
</thead>
</table>