



Amazing  
Butterflies

A Guide for Teachers and Students

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*"Teaching a child not to step on a caterpillar is as valuable to the child  
as it is to the caterpillar." - Bradley Miller*



# Amazing Butterflies

A Guide for Teachers and Students

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Dear Teacher,

Thank you for welcoming the topic of butterflies into your classroom! These lessons and activities are meant to peak your students' curiosity, summon their enthusiasm, and bring them to butterfly expert status. You will find lessons best suited for use before your visit to Amazing Butterflies, some for after your visit, and many could be used either pre or post visit. Their intention is to give you a way to expand and extend the learning with your students in a variety of exciting ways, from art, writing, and research to cooperative games and projects.

As teachers ourselves, we know how needs vary from student to student and from class to class. We encourage making adjustments to these lessons and activities and/or adding your own creative flair. We would love to hear what worked for your kids! Send your questions or feedback to: [education@minotaurmazes.com](mailto:education@minotaurmazes.com).

Again, we appreciate your joining us in promoting the appreciation of the butterfly. You and your students are in for a fascinating flight!

Enjoy!

Bente Olsen Fernandi and Betty Peralta

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Created by:



minotaur mazes

## Grade Level Guide

Recommended grade levels for each lesson and activity

Grade	Lesson 1 <i>Metamorphosis in Motion</i>	Lesson 2 <i>Life Cycle Art</i>	Lesson 3 <i>Butterflies on Blue</i>	Lesson 4 <i>Mural of a Butterfly Sanctuary</i>	Lesson 5 <i>The Great Caterpillar Race</i>	Lesson 6 <i>Compose a Cinquain</i>	Lesson 7 <i>Life Cycle Study</i>	Lesson 8 <i>Game Show</i>	Lesson 9 <i>Butterfly Species String</i>	Lesson 10 <i>Friend or Foe</i>	Lesson 11 <i>Haiku</i>	Lesson 12 <i>Design a Butterfly Sanctuary</i>	Activity 1 <i>Crossword (grades 1–3)</i>	Activity 2 <i>Crossword (grades 4–6)</i>	Activity 3 <i>Word Search (grades 1–3)</i>	Activity 4 <i>Word Search (grades 4–6)</i>
PK	*	*	*													
K	*	*	*	*	*	*										
1	*	*	*	*	*	*							*		*	
2		*	*	*	*	*							*		*	
3				*	*	*	*	*	*				*		*	
4					*	*	*	*	*	*	*	*		*		*
5					*	*	*	*	*	*	*	*		*		*
6					*	*	*	*	*	*	*	*		*		*

Feel free to adjust this guide to suit your students' needs.

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## Lesson 1: Metamorphosis in Motion

**Grade level:** pre-K–2

**Time:** 15–20 minutes

**Objective:**

Students will learn about the life cycle of a butterfly by acting out the stages.

**Standards:**

*Life Science*

- Understanding how animals have life cycles that include being born, developing into adults, reproducing, and dying

*Arts*

- Understanding dance as a way to create and communicate meaning
- Applying and demonstrating critical and creative thinking skills in dance

**Materials:** none

**Activity:**

1. Read *A Butterfly Grows* by Stephen Swinburne, or another book on butterfly metamorphosis (see bibliography for suggestions).
2. Make a chart (with student input) about the lifecycle. Have students sequence the cycle— from egg to butterfly.
3. Tell students that they will pretend to go through the stages of metamorphosis themselves, and give the following directions:
  - a. Curl up into a little ball like an egg. Stay very still on your leaf so the predators don't find you.
  - b. Stretch out slowly into a caterpillar form, and crawl around on your stomachs— pushing your knees up first and then your torso to simulate the locomotion of a real caterpillar.
  - c. Be straight and stiff with your arms wrapped around yourself as a chrysalis. Then, form the letter “J” with your body just before it is time to “hatch.”
  - d. Slowly rise and spread your arms (wings). Give them time to dry, and then “fly” around the room being a beautiful butterfly.
  - e. Find a safe place to lay your egg for the cycle to begin again.

## Lesson 2: Life Cycle Art

**Grade level:** K–2

**Time:** 45–60 minutes (or two 30-minute sessions)

### Objectives:

Students will learn the stages in the life cycle of butterflies.

Students will identify these stages and understand the habitat most conducive to each stage.

### Standards:

#### *Life science standard*

Understanding the following:

- Animals have life cycles that include being born, developing into adults, reproducing, and dying.
- All animals depend on plants.
- An organism's patterns of behavior are related to the nature of that organism's environment.

#### *Visual Arts*

- Understanding and applying media, techniques, and processes
- Making connections between visual arts and other disciplines

### Key vocabulary:

butterfly; chrysalis; pupa, egg; caterpillar; host, instar; metamorphosis; camouflage

### Materials:

orzo pasta

bite-sized lasagna (mafalda)

bow tie pasta (farfalle)

shell pasta

18" long and 4"–6" wide tagboard folded into four sections

crayons and/or markers

## Lesson 2: Life Cycle Art

### Procedure:

1. Read *Waiting for Wings* by Lois Ehlert, or another picture book to introduce the life cycle of the butterfly. (See bibliography.)
2. Ask students to provide the names of the four life cycle stages, or as many as they remember. Clearly write these stages on pieces of tagboard or sentence strips.
3. Steps of the activity are as follows:
  - a. Students will label the four sections of their long piece of tagboard with the correct name of the stage—starting with egg on the left and then caterpillar (larva), chrysalis (pupa), and butterfly (adult)—using as much vocabulary as they are comfortable with.
  - b. Students will decorate the backgrounds taking into consideration the habitat required for each stage (i.e., leaf for an egg, many leaves for a caterpillar to hide in and eat, sticks or branches for the pupa to hide itself on, and a garden of brightly colored flowers for butterflies to camouflage themselves and feed off the nectar).
  - c. Students will glue a piece of orzo onto the leaf (or several), color a bite-sized lasagna (with colors that might help it be camouflaged) and glue it onto a leaf, color the pasta shell brown and glue it to a branch they have drawn, and color the bow tie pasta brightly and glue it to the flowers. They can also add feet and antennae to the caterpillar and butterfly pasta, eyes to the butterfly, and other details to their pictures.
4. Once their sequenced pictures are complete, invite some students to show and name their stages, and then display all their work on a bulletin board!

**Assessment:** Built into the final product – if all stages are accurately labeled and executed, understanding is shown.

## Lesson 3: Butterflies on Blue

**Grade level:** pre-K—2

**Time:** One hour plus drying time (can also be done in two 30-minute sessions)

### Objectives:

Students will use symmetry to create colorful butterflies.

Students will work together to draw a garden with appropriately colored plants for attracting butterflies.

### Standards:

#### *Life Science*

- Understanding that all animals depend on plants

#### *Mathematics*

- Applying transformations and using symmetry

#### *Visual Arts*

- Understanding and applying media, techniques, and processes
- Making connections between visual arts and other disciplines

### Materials:

coffee filters  
newspapers  
pipe cleaners  
markers

food coloring (at least four different colors)  
clothespins  
light blue butcher paper

### Activity:

1. Distribute one coffee filter and some newspapers (for surface protection) to each student (or do the activity in a center).
2. Students fold coffee filters in half and drop food coloring onto the coffee filters in whatever pattern they design. (The colors will stain both sides at once.) When they have completed their design, they unfold the filters and gather the filters along the crease with a clothespin. Markers may be used to color eyes on the tip of the clothespins, and short lengths of pipe cleaner can be attached to create antennae and feet if desired.
3. Lay light blue butcher paper across a large table or floor. Students can work together to paint or draw a garden filled with red, purple, and yellow flowers, from which the butterflies can gather nectar and lots of large green leaves—on which the butterflies can lay their eggs. Eggs can be drawn on the leaves, and some caterpillars can also be camouflaged among the leaves of the garden.
4. When complete, this butterfly garden can be hung onto a bulletin board, and all the dried butterfly creations can be attached to the “sky” or to the flowers.



## Lesson 4: Mural of a Butterfly Sanctuary

(If there is not room in the classroom for a mural, students may be grouped in no more than five or six students, for smaller representations of gardens using 12" x 18" construction paper.)

**Grade level:** 1–3

**Time:** 20 minutes daily for 1 week

### Objectives:

Students will recognize plants that are beneficial to butterflies.

Students will understand that humans can benefit butterfly populations.

Students will create a garden that is attractive to butterflies and humans alike.

### Standards:

#### *Life Science*

- Animals depend on plants.
- Survival depends on basic needs.
- Animal behaviors relate to the environment.
- Humans change environments.

### Materials:

field guides\* (white copy paper, colored paper, long-arm stapler)

research materials (books, magazines, Internet)\*\*

colored pencils

various-colored construction paper

scissors

glue sticks or glue

paint, crayons, or markers

### Preparation:

1. Make field guides. (See instructions at the end of lesson.)
2. Cover a bulletin or white board with white or light blue butcher paper. (With light blue, students will not need to color the sky.)

## Lesson 4: Mural of a Butterfly Sanctuary

### Activity:

1. Read *Butterflies in the Garden* by Carol Lerner, or some other book that teaches how to attract butterflies to a garden. Teach the word, “sanctuary,” and tell students that they will create an imaginary butterfly sanctuary for people to visit. Ask them to envision what the sanctuary could look like, and how people might feel when they visit it. Have the students discuss their thoughts aloud in small groups of four or five, then as a class.
2. Explain to the students that they will represent this butterfly sanctuary as a mural. They will research which plants will attract butterflies, and about the types of caterpillars that will only eat one kind of plant so they can be included in the sanctuary’s garden.
3. Have students look through books that have illustrations of plants (see bibliography), and discuss their shapes, sizes, and colors. Point out that butterflies are most attracted to the colors red, yellow, and purple.
4. In pairs or small groups, have students catalog plants they find in their field guides. On each page, have students draw an illustration of a butterfly-friendly plant, label it with its name, and color it in. If there is a plant that a certain butterfly is likely to eat, students can draw and label the butterfly in each of its stages on that page as well.
5. Have students draw their plants on construction paper, cut them out, and glue them onto the mural. When the garden is complete, students can draw eggs, caterpillars, and butterflies on paper, cut them out, and paste them onto the mural.
6. Introduce situational topics for students to solve for their garden. Encourage students to contribute multiple answers for each situation, as well as potential problems their solutions could incur.

## Lesson 4: Mural of a Butterfly Sanctuary

### Examples:

- The garden is growing weeds, which are choking out the flowering plants. How can this problem be solved?
- The garden is attracting people, but the butterfly population is decreasing. Tobacco smoke, excessive noise, and pollution are discouraging the butterflies, and they are leaving the garden. What can be done to bring the butterfly population back up?
- Deer live in the neighborhood and also like the plants that butterflies and caterpillars enjoy. The deer are cute and attract people, but are butterflies having to compete with the deer for flowers? How would you find out, and what would you do about it?

### \*Instructions for making field guides (Can be student created.)

1. Cut 8 1/2" x 11 white copy paper in half.
2. Cut 9" x 12" or 8 1/2" x 11" of colored tagboard or construction paper in half. (These will be the book covers.)
3. For each book, lay one half-sheet of construction paper over three or four half-sheets of copy paper.
4. Fold pile in half so the colored sheet is on the outside.
5. Open so the sheets are flat again, and lay them down with the colored sheet on top.
6. Staple the sheets together so the flat side of the staple is over the colored sheet.

### \*\*List of Plants That Attract Butterflies

Students can look these plants up in Google Images for copying into their field guides.

Aster  
Black-eyed Susan  
Butterfly Bush  
Cosmos  
Goldenrod

Daisy  
Dandelion  
Grape hyacinth  
Joe-Pye weed  
Lantana

Milkweed  
Purple cornflower  
Sunflower  
Verbena  
Zinnia

For a list of plants that attract specific butterflies, go to The Butterfly Website at <http://butterflywebsite.com/butterflygardening.cfm>, and scroll down.

## Lesson 5: The Great Caterpillar Race

**Grade level:** K–6

**Objectives:**

Students will learn how a caterpillar moves by working in teams to cross a finish line as quickly as they can

Students will graph and discuss results of the teams' times in getting across the finish line

**Standards:**

*Life Science*

- Develop understanding of organism characteristics.

*Mathematics*

- Collect, organize, and display relevant data to answer questions.
- Develop and evaluate inferences based on data.
- Understand the process of measurement.
- Understand and represent relationships among numbers.

**Materials:**

25 feet of floor or ground space

masking tape for start and finish lines

scoreboard

butcher paper for class demonstration of graph

graph paper for students

crayons or markers

**Preparation:**

Divide students into UNEQUAL teams of three to six students. Each team represents one caterpillar. If there are extra students, they can act as judges to ensure teams are moving forward in order.

## Lesson 5: The Great Caterpillar Race

### Activity:

1. Measure 25 feet with students.
2. Select a team to go first. Students stand in a single file line and hold the waist or hips of the person before them; spacing themselves a full arm's length away.
3. When the students are told to go, start the timer. The last student hops or walks forward first, simulating the caterpillar's anal legs. Next, the second to last student hops forward, then, third to last, until the person in the front, the prolegs, can move forward one hop.
4. Stop the timer when the last student crosses the finish line, and record the results on the scoreboard.
5. Time and score each of the remaining teams.
6. Have students graph results (or demonstrate this through a lesson if students need graphing instruction).
7. Students discuss questions about the data.

### Example Questions:

- Are caterpillars fast or slow?
- Which team moved fastest? Slowest?
- How many students were on the fastest team?
- Did the number of students matter for speed? Why or why not?
- Are shorter caterpillars faster or slower than longer ones? Why?
- How much faster did one team move than another?
- If the racetrack were twice (or half) as far, how much longer or (shorter) might it have taken for each team to reach the finish line?
- How long would it take a team to go 600 ft? A mile?

## Lesson 5: The Great Caterpillar Race

### Tips

- ☆ Before the race, have the teams practice moving around in this manner.
- ☆ Team members may gently squeeze or pat the person ahead of them once they have completed their hop forward. This lets the next person know when to take a turn.
- ☆ When the front student has hopped forward, he or she raises both hands straight up into the air with wiggling fingers to simulate antennae. This is the back person's cue to hop forward.

### Extension Activities

- If possible, have students observe how real caterpillars move before the race.



## Lesson 6: Compose a Cinquain

\* This lesson is best presented AFTER learning about the wonders of caterpillars and butterflies or after the visit to the *Amazing Butterfly maze*.

**Grade level:** 1–6

**Time:** 30–60 minutes (grade dependent)

### Objective:

Students will write poems in modified cinquain (or true cinquain grade or ability dependent) about butterflies or caterpillars.

### Standards:

#### *Language Arts*

- Write and use different writing process elements appropriately to communicate with different audiences for a variety of purposes.
- Apply knowledge of language structure, figurative language, and genre to create print and nonprint texts.

### Materials:

writing paper  
sample poem  
final draft paper

### Key vocabulary (grade dependent):

butterfly; caterpillar; metamorphosis; pupa; larva; chrysalis; flower; nectar; flying; crawling; pollen; pollinating; instar; proboscis; abdomen; thorax; head; wings; scales; Lepidoptera; shed



## Lesson 6: Compose a Cinquain

### Activity:

1. Hook: Ask students to “turn and talk” to a neighbor for a few minutes and share their favorite part about butterflies and caterpillars (or about the Butterfly Maze). Give sufficient time to really think thoroughly about what they already knew and what information they have newly acquired.
2. Bring their attention back to you, and talk about poetry writing as a way to share with others what we have learned in a succinct and powerful way.
3. Ask students to give you a list of vocabulary they know or have acquired in their study of butterflies and caterpillars. (Or have a premade list, with students adding any extras they can think of).
4. Introduce the formula of a cinquain (or a modified version) as an example of what they will get a chance to do.
5. Have students write drafts (with a partner or individually) of their own cinquain.
6. When students’ rough drafts are complete and fall into the cinquain model, have them write a final draft to “publish” and display (along with artwork from one of the other lessons contained herein).

### Cinquain Poetry Rules

Line 1: one word (subject or noun)

Line 2: two words (adjectives) that describe line 1

Line 3: three words (action verbs) that relate to line 1

Line 4: four words (feelings or a complete sentence) that relates to line 1

Line 5: one word (synonym of line 1 or a word that sums it up)

### Example

Caterpillar

Furry, many-footed

Eating, growing, camouflaging

Molts its skin often

Larva



## Lesson 7a: Life Cycle Study Lesson Plan

**Grade level:** 3–6

**Time frame:** 60 minutes

### Objectives:

Students will learn about the life cycle of the butterfly.

Students will complete research using websites and books.

### Standards:

#### *Life Science*

- Animals have life cycles that include being born, developing into adults, reproducing, and dying.

#### *Language Arts*

- Developing research skills

### Materials:

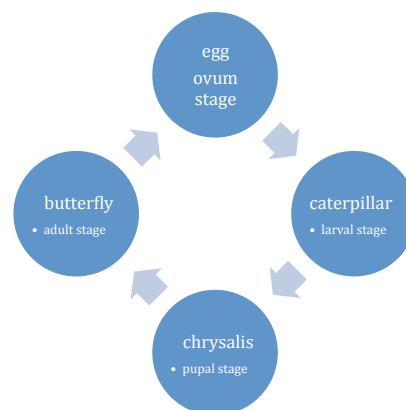
Library books on butterflies and caterpillars

Websites dedicated to butterfly education (including [www.kidsbutterfly.org](http://www.kidsbutterfly.org))

Copies of the black line master “Butterfly Life Cycle” for each student

### Activity:

1. Introduce the life cycle with a discussion of what students already know about butterflies and caterpillars.
2. Divide students into pairs, and hand out copies of “Butterfly Life Cycle” to each student. Allow students to use the Internet and books to come up with the answers to the life cycle questions. Although many of the answers can be found under the subheading “life cycle” in the website indicated above, not all answers are to be found there. Encourage students to use other resources as well.
3. Assessment is built into their completed worksheet.

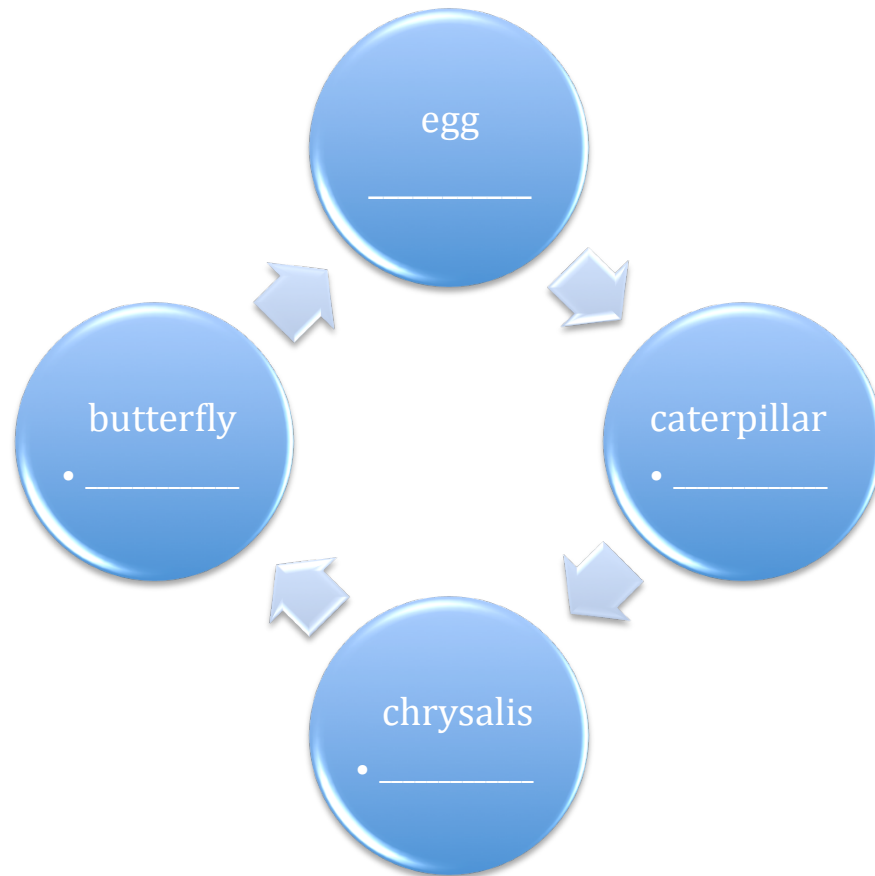


Created by:

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Lesson 7b: Butterfly Life Cycle

Directions: Fill in the blanks below.

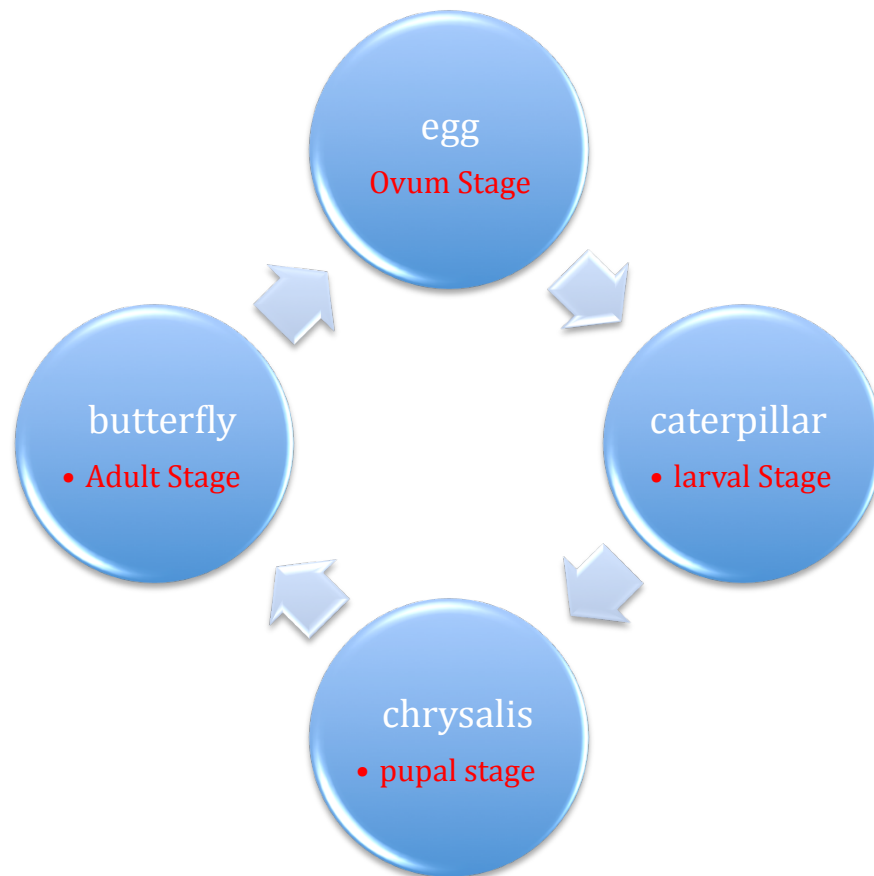


1. Label each of the stages in the circles above.
2. The first meal is often its own eggshell.  
\_\_\_\_\_
3. It becomes see-through just before it splits open.  
\_\_\_\_\_
4. The female butterfly carefully chooses the best leaf to lay this on.  
\_\_\_\_\_
5. After shedding many skins, the final one becomes its  
\_\_\_\_\_.

6. The eyes have grown, the legs are longer, and now it has wings!  
-----
7. During the larval stage, each time the caterpillar grows larger and sheds its skin is a stage called an -----.
8. Some butterflies, like the Camberwell beauty, lay these in batches, and others, like the swallowtail, lay only one on each leaf. -----
9. In how many stages is camouflage used as a defense mechanism?  
-----
10. Its mating behavior looks like a dance. -----
11. Some of these can produce weak sounds to scare off predators! -----
12. In this stage, it can only suck liquids. -----
13. A special glue is often used by this stage to adhere the egg to the leaf.  
-----
14. This is the only stage that has a proboscis, which is like a straw.  
-----
15. In this stage, it is in danger of parasitic wasps laying eggs in it!  
-----
16. Some caterpillars stay in this stage for up to seven years, waiting for the right conditions to hatch. -----
17. A butterfly hatches from a chrysalis, but a moth hatches from a -----.
18. The entire amazing process in which a caterpillar becomes a butterfly is called -----.

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Lesson 7c: Butterfly Life Cycle Answers



1. Label each of the stages in the circles above.
2. The first meal is often its own eggshell.  
\_\_\_caterpillar\_\_\_\_\_
3. It becomes see-through just before it splits open.  
\_\_\_chrysalis\_\_\_\_\_
4. The female butterfly carefully chooses the best leaf to lay this on.  
\_\_\_egg\_\_\_\_\_
5. After shedding many skins, the final one becomes its  
\_\_\_chrysalis\_\_\_\_\_.

6. The eyes have grown, the legs are longer, and now it has wings!  
\_\_\_butterfly\_\_\_\_\_
7. During the larval stage, each time the caterpillar grows larger and sheds its skin is a stage called an \_\_\_instar\_\_\_\_\_.
8. Some butterflies, like the Camberwell beauty, lay these in batches, and others, like the swallowtail, lay only one on each leaf. \_\_\_eggs\_\_\_\_\_
9. In how many stages is camouflage used as a defense mechanism?  
\_\_\_potentially all of them\_\_\_\_\_
10. Its mating behavior looks like a dance. \_\_\_butterfly\_\_\_\_\_
11. Some of these can produce weak sounds to scare off predators! \_\_\_chrysalis\_\_\_\_\_
12. In this stage, it can only suck liquids. \_\_\_butterfly\_\_\_\_\_
13. A special glue is often used by this stage to adhere the egg to the leaf.  
\_\_\_butterfly\_\_\_\_\_
14. This is the only stage that has a proboscis, which is like a straw.  
\_\_\_butterfly\_\_\_\_\_
15. In this stage, it is in danger of parasitic wasps laying eggs in it!  
\_\_\_caterpillar\_\_\_\_\_
16. Some caterpillars stay in this stage for up to seven years, waiting for the right conditions to hatch. \_\_\_chrysalis\_\_\_\_\_
17. A butterfly hatches from a chrysalis, but a moth hatches from a  
\_\_\_cocoon\_\_\_\_\_.
18. The entire amazing process in which a caterpillar becomes a butterfly is called  
\_\_\_metamorphosis\_\_\_\_\_.

## Lesson 8a: So You Think You Know Butterflies! Game Show

**Grade level:** 3–6

**Objectives:**

Students will work together to surmise or research questions about butterflies.

**Standards:**

*Life Science*

- Understand the characteristics of organisms.
- Understand the life cycle of organism.
- Understand organisms and environments.

*Language Arts*

- Apply strategies to comprehend, interpret, and evaluate texts.
- Use a variety of technological and information resources.

**Materials:**

game show cards  
Internet and/or books about butterflies

**Preparation:**

1. Split the class into teams. It is best not to have more than five or six students on each team. Have students come up with team names (or assign them butterfly species names to save time).
2. Create a scoreboard with team names on the board. (Teams will receive a tally for each point earned.)

Monarchs	Admirals	Swallowtails	Camberwell

Scoreboard

## Lesson 8a: So You Think You Know Butterflies! Game Show

### Activities:

1. Give the groups copies of the game show questions and resource materials such as book or access to the Internet. Allow students ½ hour to research questions, and try to come to consensus on the answers. (Inform students that they will play a game as a team and must keep all information they find secret from the other teams.)
2. On each team, students will take turns acting as representatives to have the final say on each question. Have students decide the representing order.
3. Game show host (the teacher) reads a question to the first team, and all teams take one minute to confer on the answer. When the minute is up, the representative from that team reports the answer.
4. If the representative answers correctly, the host reads the brief information on the back of the card, awards the team the number of points indicated on the card, and moves on to the next team. If the answer is incorrect, the next team's representative gets a try for the same number of points. This continues until a correct answer is given, or until all teams have tried to answer the question. (If no team is able to answer correctly, the host reads the answer and information on the back of the card and moves on to the next question.)
5. Game is over when all questions have been answered, or when time runs out for the activity. The team with the most points wins.

### Tips:

- ★ Team Size: The smaller the teams, the easier students will find it to discuss question topics.
- ★ Read the score along with the question (i.e., "For a score of three points, name...").

3 points

How long does the butterfly stage last for most butterflies?

- a) Usually from two to four weeks
- b) About two months
- c) Around two years
- d) Could be any of the above

Answer: a) Usually from two to four weeks

There are butterflies that last as few as two days, while other species might live for as long as eleven months!

3 points

How long does it take for a caterpillar to spin the cocoon where it will turn into a butterfly?

- a) Within three hours
- b) Within one day
- c) Overnight
- d) Butterfly caterpillars do not spin cocoons.

Answer: d) Butterfly caterpillars do not spin cocoons.

Caterpillars that turn into butterflies have chrysalises, which is a hard shell that grows from their skin.

3 points

At what time of day are most butterfly species the most active?

- a) Mid morning
- b) Late afternoon
- c) Both a and b
- d) Neither a nor b

Answer: c) Both a and b

While it is best to look for butterflies during mid morning and late afternoon, some are active all day.

3 points

What is usually the caterpillar's first meal?

- a) Its egg case
- b) The leaf it is laid on
- c) A smaller insect
- d) A nearby flower bud

Answer: a) Its egg case

After caterpillars eat their own eggs, they usually start on their host leaf.



3 points

How do butterflies decide where to lay their eggs?

- a) They look for shelter from rain and wind.
- b) They taste leaves with their feet for a suitable caterpillar meal.
- c) They choose a spot near flowers.
- d) They prefer leaves with small white spots, so the egg will be better camouflaged.

Answer: b) They taste leaves with their feet for a suitable caterpillar meal.

Butterflies avoid plants with small white spots because they mistake these for other butterfly eggs.

3 points

What stage of the butterfly's life cycle might use camouflage?

- a) Larva
- b) Pupa
- c) Adult butterfly
- d) All of the above

Answer: d) All of the above

Depending on the species, all stages of the butterfly's life might exhibit camouflage.

3 points

How many legs does a butterfly have?

- a) 2
- b) 4
- c) 6
- d) 8

Answer: c) 6

While the painted lady butterfly seems to have four because of its short forelegs, butterflies have the required six legs of all insects.

3 points

Does a caterpillar molt (shed its skin)?

- a) Yes, all caterpillars molt once before their pupa stage.
- b) Yes, all caterpillars molt several times before their pupa stage.
- c) No, caterpillars do not molt.
- d) Some types molt; some types do not.

Answer: b) Yes, all caterpillars molt several times before their pupa stage.

While the rest of the caterpillar grows, its hard outer skin does not. When this skin becomes too tight, it molts to expose the softer skin beneath. Then this skin hardens, becomes tight, and molts.

3 points

How do butterflies escape spiderwebs?

- a) Butterflies break the web to get free.
- b) The wing scales of butterflies detach, allowing them to slip away.
- c) Both a and b
- d) Butterflies cannot escape spiderwebs.

Answer: b) The wing scales of butterflies detach, allowing them to slip away.

If you touch a butterfly (which is not a good idea), its wing scales will come off on your fingers and feel like a fine dust.

3 points

Which butterfly flies the longest distance?

- a) Monarch
- b) Painted lady
- c) Tiger swallowtail
- d) a and b

Answer: a) Monarch

Monarchs fly from Mexico to northern parts of the U.S.A. Painted ladies migrate from Mexico to California. Tiger swallowtails are not known to migrate.

3 points

What is the fewest number of plant species any caterpillar type might eat?

- a) 1
- b) 5
- c) 7
- d) 10

Answer: a) 1

Some caterpillars only eat one type of plant. If the plant of a butterfly dies out, the butterfly will also become extinct.

3 points

How do colors help a butterfly?

- a) Colors serve as a warning that the butterfly is poisonous.
- b) Colors attract mates.
- c) Colors camouflage the butterfly.
- d) Colors absorb heat.
- e) a, b, and c
- f) All of the above

Answer: f) All of the above

Butterflies are cold-blooded and depend on the sun to heat them. The dark colors, brown and black, absorb the sun's heat.

3 points

Which is usually larger, the male butterfly or the female?

- a) Male
- b) Female
- c) They are generally the same size.

Answer: b) Female

3 points

Which lives the longest, the male butterfly or the female?

- a) Male
- b) Female
- c) There is no difference in lifespan between male and female butterflies.

Answer: b) Female

3 points

What is a group of caterpillars called?

- a) Team
- b) Army
- c) Herd
- d) Any of the above

Answer: a) Team

3 points

What is a group of butterflies called?

- a) Kaleidoscope
- b) Rabble
- c) Swarm
- d) Any of the above

Answer: d) Any of the above

3 points

What do adult butterflies eat?

- a) Pollen
- b) Nectar
- c) Leaves and flowers
- d) Both a and b

Answer: d) Both a and b

Butterflies also take in water, and some eat fruit, although they do not chew it.

3 points

What is the difference between moths and butterflies?

- a) Butterflies have golf club shaped antennae, and most moths do not.
- b) Moth bodies tend to be more slender than butterfly bodies.
- c) Many moths build cocoons; butterflies do not.
- d) Most moths are active at night and sleep during the day; with butterflies it is the opposite.
- f) a, c, and d
- e) All of the above

Answer: f) a, c, and d

Moth bodies tend to be thicker, and their wings usually have more scales, making them appear furry.

2 points

True or false: Butterflies hear with their ears.

Answer: False

Butterflies do not have ears; however, their wings sense changes in vibration.

2 points

True or false: Butterflies smell using their antennae and feet.

Answer: True

Butterflies have sense receptors in their antennae, feet, and other body parts that smell food and other butterflies to mate with.

2 points

True or false: Butterflies use their mouths to chew.

Answer: False

Butterflies use a tube to suck nectar from flowers and juice from fruit.

2 points

True or false: Caterpillars are a type of worm.

Answer: False

Caterpillars have legs; worms do not.

2 points

True or false: Butterflies can communicate by making a slight sound with their voices.

Answer: False

Most butterflies are silent. Those that can make sounds make clicks with their wings.

2 points

True or false: Scientists have found a way to recreate the incredibly strong glue that attaches butterfly eggs to the leaf.

Answer: False

The nature of this glue is unknown.

2 points

True or false: All caterpillars are herbivores.

Answer: False

Most caterpillars are herbivores, meaning they only eat plants. The North American harvester, however, eats aphids.

2 points

True or false: Butterflies can see the colors red, green, and yellow.

Answer: True

Butterflies are guided by color in their search for food. When feeding, they avoid the color green but are attracted to green when laying eggs.

2 points

True or false: Butterflies can see color humans cannot see.

Answer: True

Butterflies can see the ultraviolet spectrum, and some have these colors on their wings.

2 points

True or false: Scientists are unsure as to how metamorphosis (the transformation from caterpillar to butterfly) works.

Answer: True

While people have taken apart the chrysalis at various stages to see how a caterpillar changes, much is still unknown about how this process occurs.

2 points

True or false: Many adult butterflies never excrete waste.

Answer: True

These butterflies use all of their food as energy.

2 points

True or false: The tobacco leaf is poisonous to caterpillars, but butterflies can feed on its flowers safely.

Answer: True

Tobacco can be used as an organic pesticide to remove caterpillars from plants.

2 points

True or false: Monarch butterflies are poisonous.

Answer: True

Monarch caterpillars feed exclusively on milkweed, which is poisonous. This poison stays in the butterfly throughout its life. When a bird eats a monarch, it feels ill and no longer wishes to feast on them again.

2 points

True or False: You can attract butterflies by wearing pink, red, or purple.

Answer: True

Next time you visit a butterfly house, wear a shade of red.

Team name: \_\_\_\_\_

## So You Think You Know the Butterfly Game Show Questions

Use the question boxes for your team notes as you work to agree on the answers!

How long does the butterfly stage last for most butterflies?

- a) Usually from two to four weeks
- b) About two months
- c) Around two years
- d) Could be any of the above

How long does it take for a caterpillar to spin the cocoon where it will turn into a butterfly?

- a) Within three hours
- b) Within one day
- c) Overnight
- d) Butterfly caterpillars do not spin cocoons.

At what time of day are most butterfly species the most active?

- a) Mid morning
- b) Late afternoon
- c) Both a and b
- d) Neither a nor b

What is usually the caterpillar's first meal?

- a) Its egg case
- b) The leaf it is laid on
- c) A smaller insect
- d) A nearby flower bud

How do butterflies decide where to lay their eggs?

- a) They look for shelter from rain and wind.
- b) They taste leaves with their feet for a suitable caterpillar meal.
- c) They choose a spot near flowers.
- d) They prefer leaves with small white spots so the egg will be better camouflaged.



What stage of the butterfly's life cycle might use camouflage?

- a) Larva
- b) Pupa
- c) Adult butterfly
- d) All of the above

How many legs does a butterfly have?

- a) 2
- b) 4
- c) 6
- d) 8

Does a caterpillar molt (shed its skin)?

- a) Yes, all caterpillars molt once before their pupa stage.
- b) Yes, all caterpillars molt several times before their pupa stage.
- c) No, caterpillars do not molt.
- d) Some types molt; some types do not.

How do butterflies escape spider webs?

- a) Butterflies break the web to get free.
- b) The wing scales of butterflies detach, allowing them to slip away.
- c) Both a and b
- d) Butterflies cannot escape spider webs.

Which butterfly flies the longest distance?

- a) Monarch
- b) Painted lady
- c) Tiger swallowtail
- d) a and b

What is the fewest number of plant species any caterpillar type might eat?

- a) 1
- b) 5
- c) 7
- d) 10

How do colors help a butterfly?

- a) Colors serve as a warning that the butterfly is poisonous.
- b) Colors attract mates.
- c) Colors camouflage the butterfly.
- d) Colors absorb heat.
- e) a, b, and c
- f) All of the above

Which is usually larger, the male butterfly or the female?

- a) Male
- b) Female
- c) They are generally the same size.

Which lives the longest, the male butterfly or the female?

- a) Male
- b) Female
- c) There is no difference in lifespan between male and female butterflies.

What is a group of caterpillars called?

- a) Team
- b) Army
- c) Herd
- d) Any of the above

What is a group of butterflies called?

- a) Kaleidoscope
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What is the difference between moths and butterflies?

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- c) Many moths build cocoons; butterflies do not.
- d) Most moths are active at night and sleep during the day; with butterflies, it is the opposite.
- f) a, c, and d
- e) All of the above

True or false: Butterflies hear with their ears.

True or false: Butterflies smell using their antennae and feet.

True or false: Butterflies use their mouths to chew.

True or false: Caterpillars are a type of worm.

True or false: Butterflies can communicate by making a slight sound with their voices.

True or false: Scientists have found a way to recreate the incredibly strong glue that attaches butterfly eggs to the leaf.

True or false: All caterpillars are herbivores.

True or false: Butterflies can see the colors red, green, and yellow.

True or false: Butterflies can see color humans cannot see.

True or false: Scientists are unsure as to how metamorphosis (the transformation from caterpillar to butterfly) works.

True or false: Many adult butterflies never excrete waste.

True or false: The tobacco leaf is poisonous to caterpillars, but butterflies can feed on its flowers safely.

True or false: Monarch butterflies are poisonous.

True or False: You can attract butterflies by wearing pink, red, or purple.

## Lesson 9: Butterfly Species String

**Grade level:** 3–6

**Time:** Two 30-minute sessions

**Objectives:**

- Students will learn wing patterns of various butterfly species.
- Students will create artistic representations of butterfly species.

**Standard:**

*Life Science*

- Develop understanding of the characteristics of organisms.
- Develop understanding of how animal structures serve functions in survival.

**Materials:**

Butterfly guide(s) from books or the Internet  
Letter-size copy paper (8½" x 11")  
Scissors  
Paint, markers, or pastels

**Preparation:**

Cut copy paper in half lengthwise so it is 4.25 inches high (half of 8½ inches). Tape the ends of the two halves together end-to-end so that the strip is 22 inches (twice 11 inches). This will give each student enough paper to color in four butterflies.

**Activity:**

1. Have students look through a butterfly guide to select butterflies they want to learn to recognize.
2. Fold paper in half crosswise repeatedly, twice for each 8½-inch strip. Open the paper all the way; there will be four segments per 8½ inches.
3. Fold the paper again along the creases, only this time, accordion-style.
4. Draw the outline of half a butterfly on the top segment, with half of the drawing along the fold.
5. Cut along the butterfly outline, careful to leave some of the fold in tact.
6. Open and color each butterfly according to its species designs.
7. On the back of each butterfly (or on a separate piece of paper that is cut and pasted to the back of each butterfly), write its species name and a brief explanation on how its design might aid in its survival if applicable.

## Lesson 10a: Friend or Foe Lesson - Symbiosis, mimicry, and camouflage

**Grade level:** 3–6

**Time:** Two sessions of 30 minutes each

### Objectives:

Students will develop definitions of two types of symbiotic relationships based on their prior knowledge, inference, and research.

Students will develop an understanding of the difference between mimicry and camouflage.

Students will apply and transfer this new knowledge to butterflies and caterpillars.

### Standards:

#### *Life Science*

- Understanding that organisms can survive only in environments in which their basic needs can be met.
- Understanding that an organism's patterns of behavior are related to the nature of that organism's environment, including the kinds of other organisms present.

#### *Language Arts*

- Draw on prior experience, interactions with other readers and writers, knowledge of word meaning and of other texts, and word identification strategies.
- Gather, evaluate, and synthesize data from a variety of sources.
- Develop research skills: use a variety of technological and information resources.

### Materials:

Science notebook or paper

Worksheet of "friend or foe" for each student

Internet access

### Background information for the teacher:

The three main types of symbiosis commonly defined are mutualism, parasitism, and commensalism. Mimicry is often defined as a highly evolved type of symbiosis. Mutualism, parasitism, and mimicry are the three pertaining mostly to butterflies and are therefore the ones included in this lesson. Camouflage is an important distinction from mimicry.

#### Symbiosis types:

- Mutualism: both organisms benefit mutually.
- Parasitism: one organism benefits (the parasite), and the other is harmed (the host).

#### Mimicry:

- One species mimics the color, pattern, or behavior of another in order to gain protection by imitating a predator or a poisonous species (or to get closer to its own prey).

#### Camouflage:

- A species' ability to conceal itself from its predators by blending into its environment.

## Activity:

1. Watch the 2:42-minute video at: [http://video.nationalgeographic.com/video/player/animals/bugs-animals/ants-and-termites/ant\\_caterpillarsymbiosis.html](http://video.nationalgeographic.com/video/player/animals/bugs-animals/ants-and-termites/ant_caterpillarsymbiosis.html) about plant, ant, and caterpillar symbiosis. (This video has a 14-second introductory commercial from IBM about medical information on the web.) Ask follow-up questions:
  - a. Who was protecting whom?
  - b. Why was the ant willing to protect the plant?
  - c. Why was the ant willing to protect the caterpillar?
  - d. What did the caterpillar do if the ant was not nearby to assist it?
2. Show some images from the web on animal camouflage and animal mimicry. A good selection can be found by typing “animal camouflage” into Google Images.
3. Write the below four terms on the board, document camera or overhead, explaining to the students that symbiosis simply means “living together.” Have them work with a partner to write down definitions of each term in their science notebooks or on notebook paper. They should access prior knowledge—what they understood from the brief video and images that you showed them and what they can infer from the words themselves. (i.e., what word do they know in the word “mutualism?”)

mutualistic symbiosis (mutualism); parasitic symbiosis (parasitism); camouflage; mimicry
4. Provide opportunity for whole-class discussion of the definitions to ensure that all students have a good grasp on the terms.
5. Hand out a copy for each pair of the “non-butterfly” examples of mutualism, parasitism, camouflage, and mimicry on the pages that follow to provide practice for the students to use and refine their definitions and to learn to differentiate between the types of symbiosis. Alternately, this activity can be done whole class, with oral discussion and consensus being reached.
6. In session two, review the terms previously discussed and their definitions. Have students come up with examples they remember for each term.
7. Have students complete the “Friend or Foe” worksheet in pairs or on their own. This can serve as an assessment tool. Many of these relationships are represented in the maze, so this lesson and activity can be done as a pre-visit lesson or a post-visit assessment.

## Lesson 10a: Friend or Foe Lesson

### Symbiosis (Mutualism and Parasitism), Mimicry, and Camouflage

Read the following examples of animal adaptations, and decide which of the four terms applies. Place an MS (mutualistic symbiosis), PS (parasitic symbiosis), M (mimicry), or C (camouflage) in the blank provided to show which term best applies.

1. \_\_\_\_\_ The polar bear and the Arctic environment  
Polar bears blend into the blinding white snow of the Arctic in order to protect themselves and their young.
2. \_\_\_\_\_ The Egyptian plover bird and the crocodile  
When a crocodile wants a good tooth cleaning, it will sit with its mouth wide open. The Egyptian plover bird recognizes this invitation, and if one is nearby, it will fly into the mouth of the crocodile, eat the food stuck in its teeth, and fly away. The plover gets a meal, and the crocodile gets a valuable tooth cleaning!
3. \_\_\_\_\_ Tapeworms and intestines  
Tapeworms are long, flat parasites that live in the intestines of pigs, cows, and even humans. A tapeworm gets into its host by laying its eggs in the host's food source. The host eats this food, and the eggs develop and grow into tapeworms, which attach themselves to the intestines of their host. The tapeworm has a safe, warm home and a constant food source, but the host does not benefit from the relationship.
4. \_\_\_\_\_ Harlequin snake eel and the Banded sea snake  
The Harlequin snake eel looks like the Banded sea snake (an extremely toxic species with conspicuous black-and-white warning coloration). Predators that would otherwise regard it as prey are more likely to avoid the Banded sea snake. Predators would also avoid the Harlequin snake eel because it looks so much like the Banded sea snake.
5. \_\_\_\_\_ Bees and flowers  
Flowers need pollen to reproduce, but because they can't move to get it themselves, the bees get it for them. A bee goes from flower to flower gathering nectar. While it is doing this, some of the flower's pollen ends up sticking to the bee's hairy body and legs. When it goes to the next flower, some of that pollen rubs off of the bee and falls into the flower. Without bees, some flowers would have no way of getting the pollen they need to reproduce. Without flowers, bees wouldn't get the nectar they need to eat.



6. \_\_\_\_\_ Ticks and their host animals

Ticks are pinhead-sized arachnids that form relationships with birds, reptiles, animals, and sometimes humans. Ticks attach to their host's skin and feed off the host's blood. In this way, it gets both food and a home. Ticks can consume enough food to grow 200 to 600 times their original body weight. In this relationship, the tick gets the benefits of a warm home and food, while the host gains nothing. The tick may even give the host a disease, which could weaken or kill it.

7. \_\_\_\_\_ Fungi and algae

Fungi and algae combine to create lichen (pronounced liken), because together they can live in places where alone, as just algae or fungi, they could not survive. Lichen looks almost like a discoloration on a rock and lives in places where other organisms cannot. Lichen is a symbiotic relationship between two different species. Both species benefit from their relationship.

8. \_\_\_\_\_ Flatworm and sea slug

The sea slug exudes very noxious and toxic chemicals from its skin, and most fish seem to avoid it. The flatworm fools the fish by mimicking the flatworm in order to avoid being eaten.

9. \_\_\_\_\_ Your intestine and bacteria

You have a symbiotic relationship going on right now and may not know it. It happens in your intestine. When you eat food, very little of it gets digested in your stomach. It travels through your intestine where bacteria further digest the partly digested food. The bacteria also produce vitamins. Your food gets digested, you get vitamins, and the bacteria get a meal. You have your very own partnership, without which your body would not be as healthy!

10. \_\_\_\_\_ Mistletoe

Mistletoe is a plant that people hang above doorways at Christmastime. Before it gets picked and hung inside, it grows by living off of other plants. Mistletoe grows on woody plants, taking nutrients and moisture from them. It also "strangles" them—reducing the nutrients that host plants can take in. The mistletoe gets all the benefits, while the woody plant or tree has to support itself as well as the mistletoe.

<http://www.ms-starship.com/sciencenew/symbiosis.htm>

## Lesson 10b: Friend or Foe Worksheet

Directions: Use your knowledge of symbiosis, camouflage, and mimicry to determine which kind of relationship is represented in each description (mutualism, parasitism, mimicry or camouflage).

1. In Panama, ants look after the metalmark caterpillars and defend them from wasps. In return, when the ant strokes the metalmark, it secretes a sweet nectar, which the ants drink.

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2. Parasitic wasps lay their eggs in the caterpillar. When the eggs hatch, the larvae eat the caterpillar.

-----

3. Young western tiger swallowtail caterpillars look like bird poo. This prevents birds from eating them.

-----

4. Some species of caterpillar look like leaves, stems, or dirt, making it difficult for predators to find them.

-----

5. Bright copper caterpillars shelter in chambers built by tree ants. In return, these caterpillars ooze a sugary sweet drink for the ants to eat.

-----

6. The lantana flower uses its color to inform the Postman butterfly of how much nectar it has. This strategy

-----

7. The viceroy butterfly has developed a very similar coloration to the monarch butterfly. The monarch is known to its predators to be poisonous, so they don't try to eat it again.

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8. The Indian leaf butterfly looks exactly like a leaf on a twig. You could walk right by them.

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# Amazing Butterflies

A Guide for Teachers and Students

## Lesson 11: Haiku

\* This lesson is best presented AFTER learning about the wonders of caterpillars and butterflies or after the visit to the *Amazing Butterfly maze*.

**Grade level:** 3–6

**Time:** 60 minutes (grade dependent)

### Objective:

Students will write poems in haiku about the butterfly lifecycle. Students will use their knowledge of metamorphosis to write both poetically and factually correct haikus.

### Standards:

#### *Life Science*

- Develop understanding of life cycles of organisms: animals have life cycles that include being born, developing into adults, reproducing, and dying.

#### *Language Arts*

- Write and use different writing process elements appropriately to communicate with different audiences for a variety of purposes.
- Apply knowledge of language structure, figurative language, and genre to create print and nonprint texts.

### Materials:

writing paper for drafts  
sample poems  
final heavier paper that is folded into four sections

### Vocabulary:

butterfly; caterpillar; metamorphosis; pupa; larva; chrysalis; flower; nectar; flying; crawling; pollen; pollinating; instar; proboscis; abdomen; thorax; head; wings; scales; Lepidoptera; shed



## Lesson 11: Haiku

### Activity:

1. Ask students to “turn and talk” to a neighbor for a few minutes and share their favorite part about butterflies and caterpillars (or about the Butterfly Maze). Give sufficient time to really think thoroughly about what they already knew and what information they have newly acquired.
2. Bring their attention back to you, and talk about haiku writing as a way to share the natural world in a succinct and powerful way. (If they have no experience with haiku, this may be a time to introduce it as a genre.)
3. Ask students to give you a list of vocabulary they know or have acquired in their study of butterflies and caterpillars. (Or, have a premade list with students adding any extras they can think of.)
4. Introduce the formula of a haiku, and provide some samples (see next page). Haikus are three lines long with a 5-7-5-syllable sequence. They do not rhyme, but should paint a picture—usually of an aspect of nature.
5. Have students write drafts of their own haiku—encourage them to write one haiku for each of the stages of the life cycle. Alternately, students could collaborate and write the haikus together or in groups of two or four, each being responsible for a stage or individual lines of one haiku.
6. Students should copy their haikus onto each of the four sections of the final paper in sequential order of the butterfly life cycle. Encourage them to decorate the sections accordingly.

### Haiku Poetry Structure

Line 1: five syllables

Line 2: seven syllables

Line 3: five syllables

Haiku shouldn't rhyme, but it should paint a mental picture in the reader's mind.

1

Quiet still peaceful  
Green tear on its waving leaf  
The egg waits for life

2

Butterfly flitting  
Among the lovely flowers  
Sipping the nectar

## Lesson 12: Designing a Butterfly Sanctuary

**Grade level:** 4–6

**Time:** 40 minutes daily for 1 week

### Objectives:

Students will recognize butterflies that live in their area and plants that are beneficial to them.

Students will understand how humans can benefit butterflies.

Students will create a garden that is attractive to butterflies and humans alike.

### Standards:

#### *Life Science*

Develop an understanding of the following:

- Animals depend on plants.
- Survival depends on basic needs.
- Animal behaviors relate to the environment.
- Humans change environments.

#### *Language Arts*

- Gather, evaluate, and synthesize data to communicate discoveries in ways that suit their purpose.
- Use technological and information resources to synthesize to create.

### Materials:

12" x 18" graph paper (If unavailable, students can draw a 1-inch grid on white construction paper. Measuring [preferably yard] sticks are needed for this activity.)

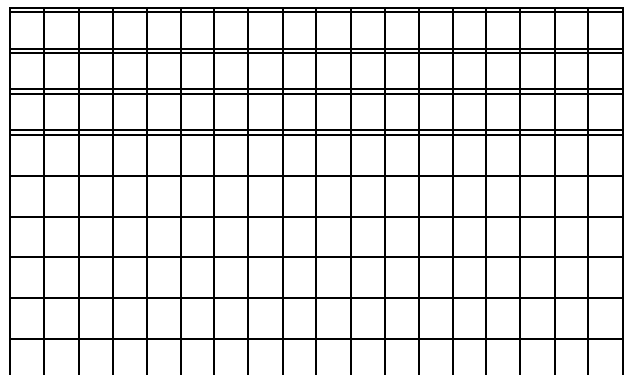
Notebooks for field guides

Colored pencils

Pictures of gardens in books, magazines, or from the Internet

### Preparation:

If large graph paper is unavailable, students can transform construction paper into drafting paper. They will draw a grid where 1 inch = 1 foot in their garden. With a yardstick, have students mark 1-inch intervals along all edges of their 12" x 18" construction paper. Using a straightedge, students connect opposing marks with straight lines.



## Lesson 12: Designing a Butterfly Sanctuary

### Activities:

1. Students will visualize the butterfly garden for their sanctuary. Ask them to do this as they research native plants that attract butterflies.
2. Students will research butterflies in your area and native plants that attract them.
  - To find butterfly species in your area, go to: <http://www.thebutterflysite.com/butterfly-gardening-by-area.shtml>
  - To match caterpillars to plants they eat, go to: <http://www.thebutterflysite.com/create-butterfly-garden.shtml>
  - To match plants with butterflies they attract, go to: <http://butterflywebsite.com/butterflygardening.cfm>
3. Students will draw, color, and label illustrations of a butterfly- friendly plant in their notebook. If there is a plant that a certain butterfly is likely to eat, students should also draw and label that caterpillar or butterfly on the page.
4. Students should look at various gardens to get some ideas of how to design theirs. They should draw a few rough sketches of some garden designs before deciding on the garden they will draft for their sanctuary. As they plan where their plants will go, they should consider the following:
  - Entrance(s)
  - Seating
  - Walking paths
  - Water feature(s)
5. Students draft their sanctuary, labeling each plant, or numbering them and providing a key with a list of their names.
6. Introduce research and/or discussion topics for students to problem-solve for their garden. Encourage students to come up with multiple answers, as well as think of any problems their solutions might incur.

## Lesson 12: Designing a Butterfly Sanctuary

### Examples:

- The mosquito population is rising, making the garden less attractive to people. How can they lessen the mosquito population while avoiding mosquito spray, which would kill butterflies as well?
- The garden is attracting people, but the butterfly population is decreasing. Tobacco smoke, excessive noise, and pollution are discouraging the butterflies, and they are leaving the garden. What can be done to bring the butterfly population back up?
- Deer live in the neighborhood and also like the plants that butterflies and caterpillars enjoy. The deer are cute and attract people, but are butterflies having to compete with the deer for flowers? How would you find out, and what would you do about it?

### Extension Activities:

1. Adding Insects: Students can paste their graph paper over a larger sheet of paper and draw the caterpillars and butterflies in this created margin. To illustrate which species eats which plant, students can draw lines from caterpillars and butterflies to the plants the students provided them.

2. Native Plants: Have students use only native plants for their garden. Use this YouTube video to teach students reasons for using only native plants:

[http://www.youtube.com/watch?v=T55GRkqz7F4&feature=Playlist&p=53EDE7E7B27846FB&playnext=1&playnext\\_from=PL&index=14](http://www.youtube.com/watch?v=T55GRkqz7F4&feature=Playlist&p=53EDE7E7B27846FB&playnext=1&playnext_from=PL&index=14) .

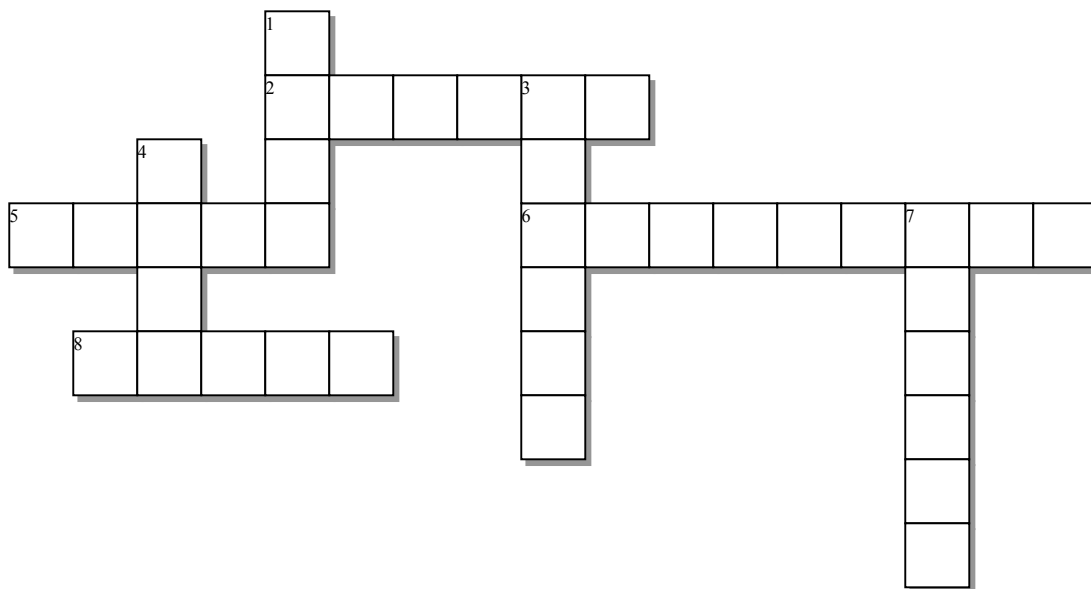
Students can find information on plants native to your area through a Regional Plant List Finder on this website: <http://www.plantnative.org/rpl-neks.htm> (scroll down for flowering perennials.)

3. Guest Speaker: Invite a master gardener who is knowledgeable about attracting butterflies to discuss concepts about building a butterfly-friendly garden. To locate a master gardener in your area, go to the American Horticultural Society website at

[http://www.ahs.org/master\\_gardeners/](http://www.ahs.org/master_gardeners/)

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Activity 1: Those Crazy Caterpillars!



Across:

2. Caterpillars' most important job
5. Some butterflies feed on this.
6. Caterpillars turn into this to become a butterfly.
8. Another word for caterpillar

Down:

1. Caterpillar and butterfly taste buds are located here.
3. Butterflies feed on this.
4. Another word for chrysalis
7. Butterflies lay eggs on these.

### Word Bank

chrysalis

feet

larva

nectar

eating

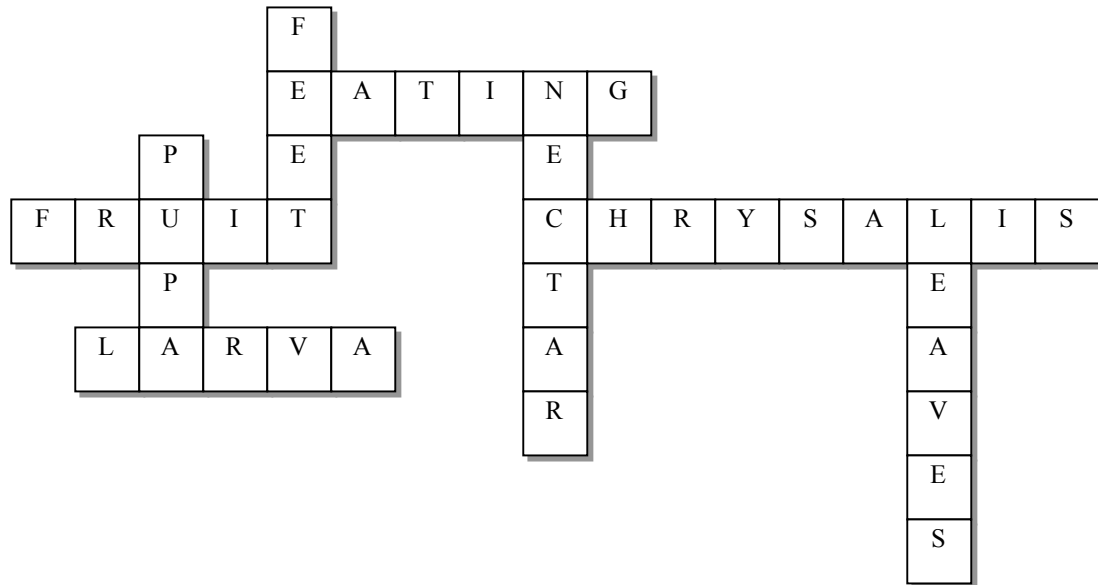
fruit

leaves

pupa

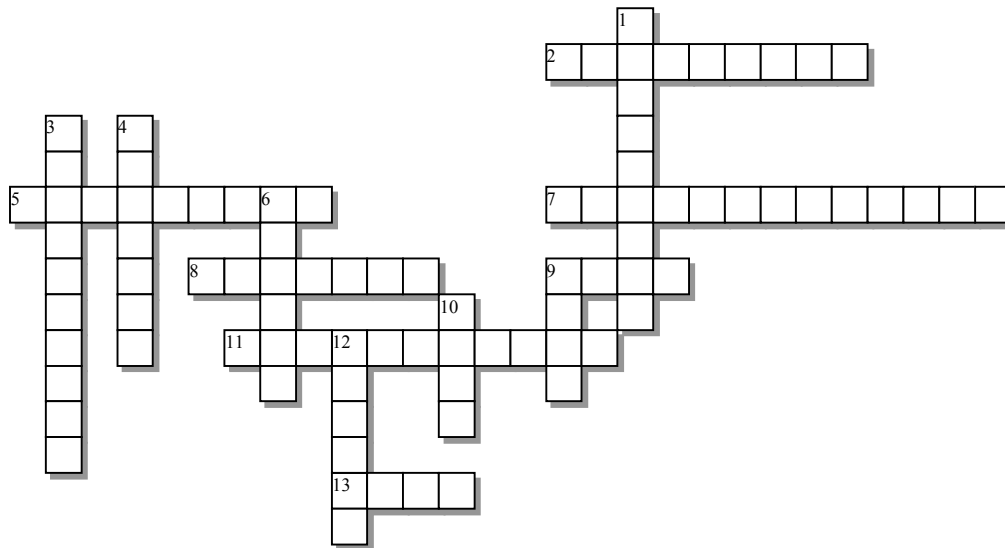


## Activity 1: Those Crazy Caterpillars! Answers



Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Activity 2: Magical Metamorphosis



### Across:

2. Eating the milkweed plant makes the monarch caterpillar \_\_\_\_\_.
5. Butterflies suck nectar out of plants through a tube called a \_\_\_\_\_.
7. The change from a caterpillar to a butterfly is called a \_\_\_\_\_.
8. The caterpillar moves by contracting its \_\_\_\_\_.
9. Caterpillar skin does not \_\_\_\_\_.
11. Caterpillars that eat aphids are considered \_\_\_\_\_.
13. Tree \_\_\_\_\_ help the bright copper caterpillar by building it a leaf shelter.

### Down:

1. In the fall and spring, monarch butterflies \_\_\_\_\_ thousands of miles.
3. Leaf-eating caterpillars are called \_\_\_\_\_.
4. One poisonous food to a caterpillar is the leaf of \_\_\_\_\_.
6. Each growth stage of a caterpillar is called an \_\_\_\_\_.
9. Eggs and chrysalises stick to leaves because of a \_\_\_\_\_.
10. The shedding of skin is called a \_\_\_\_\_.
12. Most butterflies eat \_\_\_\_\_.

## Word Bank for Magical Metamorphosis

fruit  
grow  
carnivorous  
nectar  
metamorphosis  
muscles  
glue

ants  
poisonous  
herbivores  
proboscis  
instar  
tobacco  
migrate

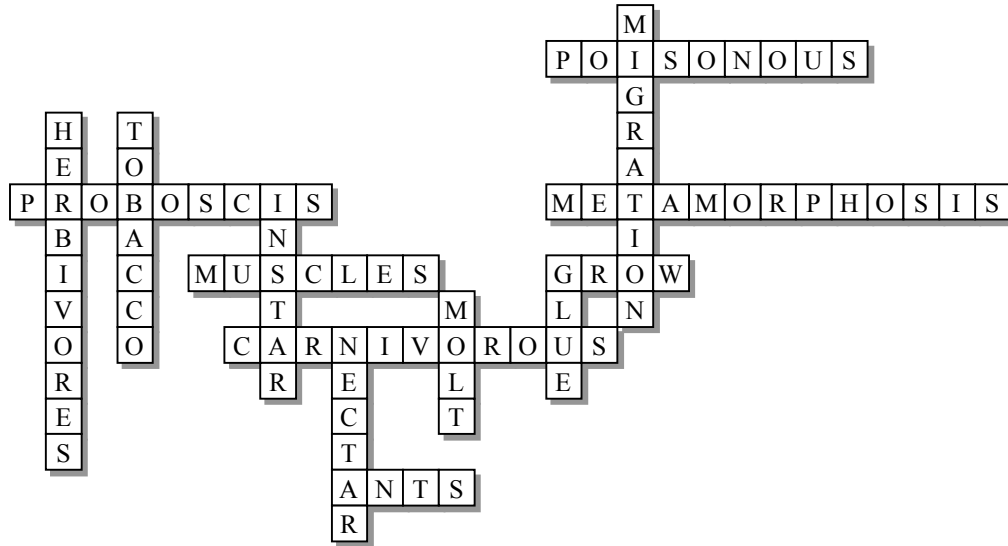


## Word Bank for Magical Metamorphosis

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tobacco  
migrate

## Activity 2: Magical Metamorphosis



## Activity 3: Word Search

m	g	c	x	s	q	w	n	e	r	c	i	y
p	e	g	l	d	x	e	g	g	y	h	l	i
s	u	t	l	i	a	t	w	o	l	r	a	w
r	l	p	a	w	a	n	t	r	f	y	s	w
y	c	t	a	m	a	a	c	m	r	s	y	r
l	a	g	h	p	o	r	h	e	e	a	r	a
f	a	c	a	t	e	r	p	i	l	l	a	r
r	r	a	l	l	i	p	p	f	t	i	c	o
e	s	h	e	d	a	i	a	h	u	s	r	r
t	p	s	a	e	k	d	n	s	o	u	t	g
t	i	l	f	a	a	e	o	o	a	s	l	a
u	b	i	t	a	t	t	m	h	a	b	i	t
b	i	f	r	a	t	c	e	n	e	d	h	s

- |                  |              |
|------------------|--------------|
| 1. caterpillar   | 6. egg       |
| 2. butterfly     | 7. nectar    |
| 3. metamorphosis | 8. leaf      |
| 4. pupa          | 9. chrysalis |
| 5. eat           | 10. dance    |

## Activity 3: Word Search Solution

m	g	c	x	s	q	w	n	e	r	c	i	y
p	e	g	l	d	x	e	g	g	y	h	l	i
s	u	t	l	i	a	t	w	o	l	r	a	w
r	l	p	a	w	a	n	t	r	f	y	s	w
y	c	t	a	m	a	a	c	m	r	s	y	r
l	a	g	h	p	o	r	h	e	e	a	r	a
f	a	c	a	t	e	r	p	i	l	l	a	r
r	r	a	l	l	i	p	p	f	t	i	c	o
e	s	h	e	d	a	i	a	h	u	s	r	r
t	p	s	a	e	k	d	n	s	o	u	t	g
t	i	l	f	a	a	e	o	o	a	s	l	a
u	b	i	t	a	t	t	m	h	a	b	i	t
b	i	f	r	a	t	c	e	n	e	d	h	s

1. caterpillar
2. butterfly
3. metamorphosis
4. pupa
5. eat
6. egg
7. nectar
8. leaf
9. chrysalis
10. dance

## Activity 4: Word Search

d	e	a	p	r	o	l	e	g	s	c	z	s	d	y	s
b	a	g	c	x	s	q	w	n	e	r	t	i	y	j	i
k	d	n	g	l	d	x	e	i	z	y	n	l	i	e	s
a	s	o	c	l	i	a	t	w	o	l	l	a	w	s	o
i	r	l	p	e	w	a	n	t	r	f	a	s	w	y	h
n	e	c	t	a	r	a	a	o	m	r	u	y	r	c	p
s	w	a	g	h	p	e	r	h	i	e	a	r	a	o	r
t	o	a	t	p	e	u	s	c	n	t	s	h	f	e	o
a	l	r	a	l	l	i	p	r	e	t	a	c	o	a	m
r	f	s	h	e	d	a	i	a	l	u	d	r	r	s	a
p	u	p	s	a	e	a	d	n	s	b	u	t	g	n	t
g	g	i	l	f	a	a	e	o	o	a	e	l	a	i	e
h	a	b	i	t	a	t	r	m	h	a	b	t	l	o	m

1. caterpillar
2. butterfly
3. metamorphosis
4. pupa
5. eat
6. egg
7. nectar
8. leaf
9. monarch
10. swallowtail
11. Molt
12. chrysalis
13. spider
14. wing
15. habitat
16. flowers
17. migration
18. host
19. dance
20. prolegs
21. crawl
22. instar

## Activity 4: Word Search

d	e	a	p	r	o	l	e	g	s	c	z	s	d	y	s
b	a	g	c	x	s	q	w	n	e	r	t	i	y	j	i
k	d	n	g	l	d	x	e	i	z	y	n	l	i	e	s
a	s	o	c	l	i	a	t	w	o	l	l	a	w	s	o
i	r	l	p	e	w	a	n	t	r	f	a	s	w	y	h
n	e	c	t	a	r	a	a	o	m	r	u	y	r	c	p
s	w	a	g	h	p	e	r	h	i	e	a	r	a	o	r
t	o	a	t	p	e	u	s	c	n	t	s	h	f	e	o
a	l	r	a	l	l	i	p	r	e	t	a	c	o	a	m
r	f	s	h	e	d	a	i	a	l	u	d	r	r	s	a
p	u	p	s	a	e	a	d	n	s	b	u	t	g	n	t
g	g	i	l	f	a	a	e	o	o	a	e	l	a	i	e
h	a	b	i	t	a	t	r	m	h	a	b	t	l	o	m

1. caterpillar
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# Amazing Butterflies

A Guide for Teachers and Students

<b>National Science Education Standards</b>	<b>Lesson</b>	<b>Grade Level</b>
Content Standard C (Life Science): As a result of activities, all students should develop understanding of the characteristics of organisms: organisms can survive only in environments in which their basic needs can be met: each plant or animal has different structures that serve different functions in growth, survival, and reproduction: the behavior of individual organisms is influenced by internal cues (such as hunger) and by external cues (such as a change in the environment).	3 4 5 8 9 12	K–2 1–3 K–6 3–6 3–6 4–6
Content Standard C (Life Science) cont.: As a result of activities, all students should develop understanding of life cycles of organisms: plants and animals have life cycles that include being born, developing into adults, reproducing, and eventually dying.	1 2 7 8 11	Pre-K–2 Pre-K–2 3–6 3–6 4–6
Content Standard C (Life Science) cont.: As a result of activities, all students should develop understanding of organisms and environments: all animals depend on plants: an organism’s patterns of behavior are related to the nature of that organism’s environment, including the kinds and numbers of other organisms present, the availability of food and resources, and the physical characteristics of the environment: humans change environments in ways that may be either beneficial or detrimental for themselves and other organisms.	2 4 8 12	Pre-K–2 1–3 3–6 4–6
<b>National Council of Teachers of Mathematics Standards</b>	<b>Lesson</b>	<b>Grade Level</b>
<b>Number and Operations</b> Instructional programs from prekindergarten through grade 12 should enable all students to—understand numbers, ways of representing numbers, relationships among numbers, and number systems: understand meanings of operations and how they relate to one another: compute fluently, and make reasonable estimates.	5	K–6
<b>Data Analysis and Probability</b> Instructional programs from prekindergarten through grade 12 should enable all students to—formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them: select and use appropriate statistical methods to analyze data: develop and evaluate inferences and predictions that are based on data.	5	K–6
<b>Measurement</b> Instructional programs from prekindergarten through grade 12 should enable all students to—understand measurable attributes of objects and the units, systems, and processes of measurement: apply appropriate techniques, tools, and formulas to determine measurements.	5	K–6
<b>Geometry</b> Instructional programs from prekindergarten through grade 12 should enable all students to—analyze characteristics and properties of two- and three-dimensional geometric shapes and . . . apply transformations and use symmetry to analyze mathematical situations: use visualization, spatial reasoning, and geometric modeling to solve problems.	3	Pre-K–2

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# Amazing Butterflies

A Guide for Teachers and Students

<b>Kennedy Center's ArtsEdge: Arts Standards</b>	<b>Lesson</b>	<b>Grade Level</b>
Dance Content Standard 3: Understanding dance as a way to create and communicate meaning	1	Pre-K–2
Dance Content Standard 4: Applying and demonstrating critical and creative thinking skills in dance	1	Pre-K–2
Visual Arts Content Standard 1: Understanding and applying media, techniques, and processes	2 3	Pre-K–2 Pre-K–2
Visual Arts Content Standard 6: Making connections between visual arts and other disciplines	2 3 4	Pre-K–2 Pre-K–2 K–4
<b>National Standards for the English Language Arts (from the National Council of Teachers of English)</b>	<b>Lesson</b>	<b>Grade Level</b>
K–12.3 <i>Evaluation strategies</i> Students apply a wide range of strategies to comprehend, interpret, evaluate, and appreciate texts. They draw on their prior experience, their interactions with other readers and writers, their knowledge of word meaning and of other texts, their word identification strategies, and their understanding of textual features (e.g., sound–letter correspondence, sentence structure, context, graphics).	10	4–6
K–12.5 <i>Communication strategies</i> Students employ a wide range of strategies as they write and use different writing process elements appropriately to communicate with different audiences for a variety of purposes.	6 11	1–6 4–6
K–12.6 <i>Applying Knowledge</i> Students apply knowledge of language structure, language conventions (e.g., spelling and punctuation), media techniques, figurative language, and genre to create, critique, and discuss print and nonprint texts.	6 11	1–6 4–6
K–12.7 <i>Evaluating Data</i> Students conduct research on issues and interests by generating ideas and questions, and by posing problems. They gather, evaluate, and synthesize data from a variety of sources (e.g., print and nonprint texts, artifacts, people) to communicate their discoveries in ways that suit their purpose and audience.	10 12	4–6 4–6
K–12.8 <i>Developing Research Skills</i> Students use a variety of technological and information resources (e.g., libraries, databases, computer networks, video) to gather and synthesize information and to create and communicate knowledge.	7 8 12	3–6 3–6 4–6

The Kennedy Center: ArtsEdge. <http://artsedge.kennedy-center.org/teach/standards.cfm> (cited August 15, 2009).

Education World. [http://www.education-world.com/standards/national/lang\\_arts/index.shtml](http://www.education-world.com/standards/national/lang_arts/index.shtml)

Copyright 1996–2009 by Education World, Inc (cited August 15, 2009).

Principles and Standards for School Mathematics. <http://standards.nctm.org/document> (cited August 15, 2009).

National Research Council. *National Science Education Standards*. National Academy Press, 1996.

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## Picture Book Bibliography

### Primary grades

Allen, Judy; Humphries, Tudor. ***Are You a Butterfly?*** Kingisher Publications Plc., 2000.

If you *are* a butterfly, this book provides tips and what to expect as you live your life from egg to adulthood. It has some interesting facts about your species, too.

For Pre-K–2<sup>nd</sup> Grade

Bishop, Nic. ***Butterflies and Moths.*** Scholastic Inc.,

Extreme close-up photographs of a caterpillar emerging from its egg and eating it (shown at 45 times its actual size); the progression of a chrysalis' growth and frontal views of a butterfly's body grace the pages of this book that has fascinating information we found nowhere else.

For Pre-K and up

Campbell Ernst, Lisa. ***Bubba and Trixie.*** Aladdin, 2001.

Bubba, a caterpillar, is afraid to leave the parsley plant where he was born until he meets a fearless ladybug, Trixie. Together, they frolic in their garden home until Bubba is informed that he will change. Determined to keep this from happening, Bubba finds a surefire way to remain a caterpillar...Or does he?

For Pre-K–3<sup>rd</sup> Grade

Cassie, Brian; Pallotta, Jerry. ***The Butterfly Alphabet Book.*** Charlesbridge Publishing, 1995.

Each letter stands for a different butterfly species in this informative and vibrantly illustrated book.

For Pre-K–3<sup>rd</sup> Grade

Ehlert, Lois. ***Waiting for Wings.*** Scholastic Inc., 2001.

This colorful, large-print rhyming book describes the life story of a butterfly from egg to adult.

For Pre-K–1<sup>st</sup> Grade

Huseby, Victoria. ***Butterfly*** (Looking at Life Cycles). Black Rabbit Books, 2009.

A basic overview of the butterfly's life cycle, with large print, straightforward facts, and close-up illustrations.

For Pre-K and up

Jeunesse, Gallimard; Delafosse, Claude. ***Butterflies.*** Scholastic Inc., 2004.

This book uses transparent overlays to illustrate physical features, mating, camouflage, and more. At the end, find directions for making a paper string of butterflies.

For 2<sup>nd</sup>–4<sup>th</sup> Grade

Johnston, Tony. ***Isabel's House of Butterflies.*** Sierra Club Books for Children, 2003.

Children learn about the migration of the monarchs in this story set in Michoacan, Mexico. Money is tight for Isabella's family, so to Isabella's dismay, her parents begin to talk of chopping down her beloved tree that hosts monarchs each year, in order to sell the wood. Isabella must think of a plan to save her trees—and the butterflies.

For Pre-K–3<sup>rd</sup> Grade

## Picture Book Bibliography

Lerner, Carol. *Butterflies in the Garden*. Harper Collins, 2002.

This book teaches how to recognize different butterfly species groups and how to attract butterflies to a garden.

Swinburne, Stephen. *A Butterflies Grows* (Green Light Readers Level 2). Houghton Mifflin Harcourt, 2009.

Winer, Yvonne. *Butterflies Fly*. Margaret Hamilton Books, 2000.

This is a rhyming book of illustrated poetry. It has a Butterfly Identification Guide at the end.

For Pre-K–3<sup>rd</sup> Grade

Pallotta, Jerry. *The Butterfly Counting Book*. Scholastic Inc., 1998.

Count the butterflies on each page while learning interesting facts about different butterfly species.

For Pre-K–3<sup>rd</sup> Grade

Rabe, Tish. *My, Oh My—a Butterfly*. Random House, Inc., 2007.

The Cat in the Hat teaches about butterflies with Dr. Seuss-style charm. This rhyming book includes comparisons between butterflies and moths, information on how to make a butterfly field guide, and many interesting facts about the butterfly at its different stages.

For Pre-K and up

Sandved, Kjell B. *The Butterfly Alphabet*. Scholastic Inc., 1996.

This poetic rhyming book shows every letter and numeral in extreme close-up photos of butterfly wing scale patterns.

For Pre K–3<sup>rd</sup> Grade

## Intermediate Grades

Barner, Bob. *Dinosaurs Roar, Butterflies Soar!* Chronicle Books LLC, 2009

For an historical perspective on butterflies, turn to this fun, colorful, and informative book. It shows how the butterfly's ancestor, the moth, was around during the Cretaceous period, and how it survived the dinosaurs.

For 3<sup>rd</sup>–6<sup>th</sup> Grade

Hamilton, Kersten. *The Butterfly Book: a Kid's Guide to Attracting, Raising, and Keeping Butterflies*. John Muir Plc., 1997.

The how-to book of butterflies: includes a butterfly species guide, as well as instructions on hunting for eggs, caterpillars, and chrysalises; catching, housing, and feeding butterflies; and much more.

For 4<sup>th</sup>–6<sup>th</sup> Grade

Meister, Cari. *Butterflies* (Insects). ABDO Publishing Company, 2001.

A fact-filled resource that is well illustrated and organized in a research-friendly format.

For 3<sup>rd</sup>–4<sup>th</sup> Grade

## Picture Book Bibliography

Schlaepfer, Gloria. ***Butterflies*** (Animal Ways). Marshall Cavendish Benchmark, 2006.

This book is replete with detailed, little known facts that cover every aspect of the butterfly, including an exploration of its ancestry, its symbolism around the world, and a section on butterfly farming.

For 4<sup>th</sup> Grade and up

Stewart, Melissa. ***Butterflies*** (Our Wild World). NorthWord Books for Young Readers, 2007.

A resource for research, this book is filled with information and glossy photos of butterflies.

For 4<sup>th</sup>-6<sup>th</sup> Grade

## Web Bibliography

AskNature – A Project of the Biomimicry Institute

<http://www.asknature.org/>

See how industry uses butterflies to inspire new technology; use the site's "How would Nature..." search field to learn fascinating facts about butterflies and other insects.

2009, The Biomimicry Institute.

Butterfly Preschool Activities and Crafts

<http://www.first-school.ws/THEME/animals/insects/butterfly.htm>

Here, you will find lesson plans, printable crafts, activities, and related early childhood resources suitable for toddlers, preschoolers, and kindergarten.

2008, First-School.ws.

Butterfly Rainforest: Where Science Takes Flight

Butterfly Discovery Game

<http://www.flmnh.ufl.edu/butterflies/game/game.htm>

Students pretend to be Lepidopterists and create their own butterfly. After choosing body, wing shape, and pattern, they learn about similar butterfly species. They then create a name and location for their butterfly, and they tell how it protects itself.

2009, Florida Museum of Natural History.

The Butterfly Website

<http://butterflywebsite.com/butterflygardening.cfm>

Go to this page to get great tips on creating a butterfly garden. The rest of the site has a plethora of butterfly resources, such as lesson plans for Preschool to 2<sup>nd</sup> grade, articles, clip art, and more.

2009, Mikula Web Solutions.

The Children's Butterfly Site

<http://www.kidsbutterfly.org>

Use this site to find facts, educational activities, and child-created photo stories related to butterflies.

Students are also invited to submit butterfly photo stories of their own. There is a photo gallery with species information, a lesson plan that follows Eric Carle's *The Very Hungry Caterpillar*, and links to many other educational sites.

Opler, Paul A., Kelly Lotts, and Thomas Naberhaus. 2009, Bozeman, MT: Big Sky Institute.



## Web Bibliography

Journey North: Monarch Butterfly Migration

<http://www.learner.org/jnorth/monarch/>

If your students live within an area of the monarch's migration, this site enables them to help track it each fall and spring. Students can report their observations on the site's migration map. Students can also use this site to stay apprised of current migration reports.

2009, Journey North.

Science Daily: Insect (and Butterfly) News

[http://www.sciencedaily.com/news/plants\\_animals/insects\\_and\\_butterflies/](http://www.sciencedaily.com/news/plants_animals/insects_and_butterflies/)

Check for current events related to butterflies here.

2009, ScienceDaily LLC.

