

Butterfly: The Story of a Life Cycle

TEACHER GUIDE

Kupferberg Center Performances @ Queens College

The Teacher Guide is a convenient source of background information, mini-lessons, and pre- and post-concert activities that coordinate with the performance and Student Guide to encourage learning across the curriculum. Most activities can be easily adapted to suit different age groups. This Guide supports the "Blueprint for Teaching & Learning in the Arts," and includes City and State Learning Standards. Click on the URL's to link directly to suggested websites. Feel free to reproduce these materials, as well as Student Activity Pages that may be posted on this website.

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Please send documentation (photographs, compositions, etc.) of class activities based on this guide so we can share your successes with other schools attending Revelations performances. Thanks!

About the Company

HUDSON VAGABOND PUPPETS (HVP), incorporated in 1980, creates larger-than-life puppetry and mask programs designed to fit into the school curriculum as well as to entertain children and their families. Our performers are professional dancers and actors. Clad in black, the puppeteers borrow from the traditional Japanese Bunraku style of puppetry, becoming mere shadows of the enormous figures they bring to life.

HVP tours nationally throughout the year and has performed in concert halls, theater, colleges, and major performing arts centers, including Brooklyn Academy of Music, The California Institute of Technology, Empire Center at the Egg, The Tilles Center for the Arts, Centre East Presents, the Luther Burbank Center, and the New Jersey Performing Arts Center.

Narrated ballets are a specialty of the company. Our puppets have danced with symphony orchestras including The Little Orchestra Society at Avery Fischer Hall, the Phoenix Arizona Symphony, the Wheeling W. VA Symphony (conducted by Rachel Warby), the St. Louis Symphony, the Detroit Symphony, and the United States Military Concert Band at Eisenhower Hall at West Point. For more information about the Hudson Vagabond Puppets, visit <http://www.hvpuppets.org>.

Words to Know

Chrysalis/pl. chrysalides: The case in which a caterpillar changes into a butterfly

Conservation: The careful protection of something

Metamorphosis: A marked change of physical form, structure or substance

Migration: A long journey, usually every year, from one region or climate to another for feeding or breeding

Proboscis: A long, flexible tongue that is used for sipping nectar

Curriculum Focus: Science

NYC Science Standards: 2 a, b, c, d

Coordinate with Student Guide: "The Amazing Milkweed Plant," and
"The Butterfly Life Cycle"

HVP provides an excellent Study Guide with more detailed information for your science unit. For your convenience, their guide is posted on our website.

Raising and releasing butterflies to learn about their life cycle is a rewarding project for any classroom. Raising monarch caterpillars is more challenging, because unlike the painted lady butterflies found in the usual kits, monarchs require 2 to 3 small milkweed plants at least 4 months old – each!! However, this challenge can extend your insect unit into a plant unit, and is worth the extra effort.

THE PLANT UNIT

❖ PLANTING MILKWEEDS

Begin after the December holidays with your plant unit. As part of your unit, you might like to plant tropical milkweed seeds. This type of milkweed is especially attractive to the adult females, who enjoy the nectar of its flowers and will lay their eggs on its leaves.

Web resources are listed at the end of this guide.

MATERIALS

- Milkweed seeds – several per student
- Coffee filters – 1 per student
- Plastic baggies – 1 per student
- Water
- Pencil
- Sharpie
- Plastic cups – 1 per student
- Tray to hold cups
- Soil or seed starter (perlite, vermiculite, peat moss) from local nursery
- Bucket
- Watering cans – 1 per table
- Fertilizer
- Planters – 2 for each caterpillar you are thinking of getting.
- Small clay pots for growing the plants

PROCEDURE

PART 1

Students will:

1. Dampen the coffee filters with watering cans (caution them not to make them too wet).
2. Scatter some seeds on each filter.
3. Fold each coffee filter into fourths.
4. Place each coffee filter into its own sandwich baggie. (Use a sharpie to identify each bag with the student's name).
5. Close the baggie over, leaving air inside.
6. Place the baggie on a warm spot in the classroom. We use the top of a bookcase near the radiator.
7. The seeds will germinate in about a week.

PART 2

1. With a sharp pencil point, make a hole in the bottom of your plastic cups for drainage. Label cups with each child's name.
2. Place seed starter in the cups. (You can use soil, but the seeds will grow faster in starter.)
3. Water the starter until moist by mixing starter and water together in a bucket. Transfer the moist starter into each child's cup.
4. Transfer the seedlings into the cups. You can use your pencil to poke a hole in the soil. Place seedlings in the hole root down. (If your seedlings are too small to handle, you can use a tweezer, or leave them for another few days.)
5. Keep them moist, but not wet – seed starter tends to mildew.
6. Use fertilizer at half strength in water every other week.
7. Keep them in a sunny location.
8. Appoint “plant monitors” – students who are responsible for taking care of the plants for a week. They should check the soil for dryness, watering when needed, etc. This will give students responsibility for the seeds they've planted.

PART 3

1. After seedlings have grown 3-4 inches, transfer the strongest ones into larger pots filled with soil. Retain the starter medium around the roots when you repot them. Dedicate some for your caterpillars, and plant the rest in your butterfly garden.

Caution: Aphids are insects that eat plants and can devastate your whole crop of milkweed. If you find aphids (little, grayish-white bugs) on your stems or leaves and soapy water does not do the trick, find ladybugs or order some from insect companies such as Insect Lore and let them feast on your aphids!

Extension: Plant some of the seedlings into pots the students have decorated and gift them with a bag of milkweed seeds and information about Monarch migration to moms on Mother's Day.

❖ THE BUTTERFLY GARDEN

You will need authorization from your principal, the approval and support of your head custodian, and some helpful parental hands for this part of the project.

1. Select a sunny spot in a protected area. (Try to avoid planting near where buses wait to pick up the students, as the exhaust they generate is not conducive to caterpillar health and survival).
2. Define your plot with edging (there are a lot of choices at shops like Home Depot). This serves to delineate your garden and to stop an enthusiastic mower from running over your growing plants!)
3. Turn the soil (this is where some strong parental arms will come in handy).
4. Plant your seedlings.
5. Plant other butterfly plants to supplement your seedlings and attract other kinds of butterflies. Base these choices on student research. It will be less work in the long run if you choose to plant native perennials that come back every year with little effort. We've had success with Joe Pye Weed (tiger swallowtails will come to your garden too with this one!), the Butterfly Bush, and swamp milkweed whose seeds will survive the winter. You may want to add local nectar annuals like zinnias, liatris (meadow blazing star – Monarchs love these) and asters. Herbs like rue and parsley attract butterflies as well. Your next year classes can plant the annual seeds!
6. It is helpful to have several watering cans and several “garden monitors” who can change weekly.

7. When it comes time, release your butterflies into your garden!

❖ THE INSECT UNIT

Preparing the Caterpillar's Home

1. To prepare for studying the life cycle of the butterfly, you will need to have a cage made of netting. This can be ordered from a number of reputable companies. It should be large enough to hold a plant per caterpillar. Less is more; two or three caterpillars will do. You need to give yourself at least a month before school ends for this part of the project.
2. There are many activities found in a variety of publications that can be used to deepen the experience. Links to sites and book titles can be found below.
3. When your eggs or larvae arrive, cover the floor of the net cage with paper towels to facilitate clean up.
4. Place a plant for each caterpillar in the net cage.
5. Clean the bottom daily by folding up the dirty paper towels and laying down new ones.
6. Replace the plants when leaves are gone.

The Metamorphosis

1. Caterpillars will hang upside down in a "J" when they are getting ready to form their chrysalis. Once in the chrysalis, it is best they are not disturbed. Metamorphosis may be magical – but it also requires some peace and quiet away from inquisitive fingers!
2. You will be able to see their wings through a now-transparent chrysalis when they are nearly ready to hatch. The chrysalis will shake, and then a slit will appear where the butterfly slides out. It is really important to not assist in this process.
3. The butterfly's wings will look crumpled at first. Don't worry! Soon, it will pump fluid into its wings until they are strong and dry and ready for flight.
4. Introduce your butterflies to your new garden. Have a release party!

Extension: Try raising silkworm caterpillars into silk moths simultaneously with your Monarchs, comparing and contrasting their life cycles.

Curriculum Focus: Math

NYC Math Standards: M2e, g, I, M6c, M8b

- Measure your caterpillars on a weekly basis, using the millimeter side of the stick.
- Have a scavenger hunt. Legos or small games pieces are helpful for this activity. In small groups, find something that:
 - Is about the same length as your caterpillar
 - Is about the same width as your caterpillar
 - Is about the same weight as your caterpillar
 - Would be a large enough space for your caterpillar to squeeze through
 - Has the same color or colors as (part) of your caterpillar.
- Have students keep a daily journal with observations, measurements, etc.

Curriculum Focus: Language Arts

NYC Language Arts Standards: 1b, 1c, 5a, 5b

❖ WRITING HAIKU

Coordinate with Student Guide “Butterfly Haiku.” Read the samples, and then following directions in the Student Guide, have students create their own haiku. See Visual Art section below for suggestions on displaying the poems.

❖ MINI-LESSON: POINT OF VIEW

Whole Group: Read a story that shows a specific point of view from the first person.

Individual Work: Write a small moment from your caterpillar’s point of view: the moment he hatched, a moment in his life, the moment he realized he could fly.

Confer with each student individually. Have them revise as necessary.

Share: Share the stories with the whole group.

Curriculum Focus: Visual Arts

NYC Arts Standard: 1

Blueprint for the Arts: Visual Art: Art Making

❖ CREATE A CHRYSALIS DISPLAY

MATERIALS

- Cardboard or oak tag
- Construction paper
- Craypas
- Stapler
- Writing paper
- Glue or tape
- Optional:**
- Hole punch
- String

PROCEDURE

Teacher Prep: On pages 10-12 of this guide, you will find templates for a chrysalis and for two butterflies. Download the chrysalis and create a template or a tracer-shape you can use yourself (or let older students use) to pre-cut two shapes per student. Download the butterfly shapes. Either print them for young students, or create a tracer-shape for older students. Also prepare two 1” x 3” strips of construction paper for each student.



Procedure:

Chrysalis: Students will trace and cut 2 copies of the chrysalis shape on construction paper and color them. Select a natural green color paper or a neutral color that students can color green. Color the dots with yellow Craypas.

Haiku: Students will carefully print their original haiku on writing paper cut small enough to fit inside the chrysalis. (See Language Arts activity above). Glue the paper inside the chrysalis, where text on greeting card would go.

Butterflies: Students will cut out both butterfly shapes and use craypas to decorate each. The large spots are colored orange, the small remain white. The small shape will be used for the chrysalis; the larger butterfly for hanging on the display. Fold each shape in half gently to score the center of the butterfly.

Students will take the 1"x3" strips of construction paper and pleat them accordion style. Glue or tape one end of each strip to the back of each butterfly. Set aside the larger butterfly. Glue or tape the other end of the strip on the small butterfly to the left inside of the chrysalis.

AFTER the haiku and butterfly have been attached to the two sides of the chrysalis, staple the left, un-indented sides of the chrysalis together, so that it opens like a greeting card. The chrysalis should close a bit naturally, but loosely, so you can see a bit of what's inside.

If you plan to hang the chrysalides as part of a display, you will need to punch a hole on the haiku side. Hold up the chrysalis to help determine the position of the hole, so that it will be evenly balanced when hanging.

Display: The chrysalides can be attached to the bulletin board. Alternate the large butterflies on the display background. If you find a large tree branch on the ground, position it securely in a large vase or pot, and hang the paper chrysalises from its branches by strings, along with some paper butterflies, or suspend it from the top of the bulletin board using eye hooks, depending on the set-up of your room or hallway. It makes for a fanciful and fun display!

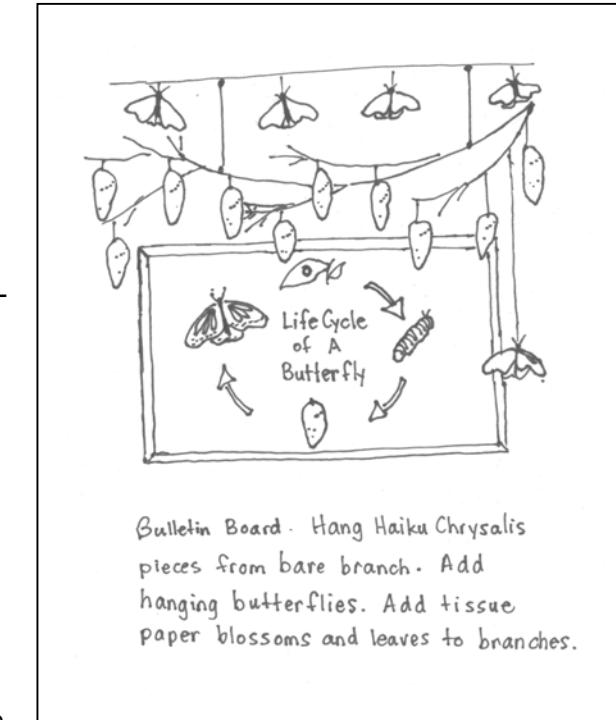
Alternative Butterfly

Mini-lesson: Symmetry. Define symmetry and show some examples. Provide a tracer butterfly by using the outline of the large butterfly shape we have provided and cutting it out of cardboard or oak tag. Students use the template to trace blank butterfly shapes on white paper. Provide orange and white paint. Fold butterflies in half to score the paper -- then open them up again. Students put small blobs of orange paint on one side of the butterfly, and smaller spots along the bottom of the wing. They can refer to a picture of the Monarch butterfly for placement.

(Blobs don't mean gobs of paint – too much paint and the effect will be ruined!) Fold butterfly shape back in half on the scored line. Rub the unpainted side on painted side. Open to dry. The painted shapes will be symmetrical on either side. When dry, use black craypas to outline the symmetrical shapes created. Although this is more involved, it will result in unique-looking butterflies.

❖ MAKE SHADOW PUPPETS

Coordinate with the Student Guide: "Take It Home: Make Your Own Shadow Puppet" Follow the directions in the Student Guide to create puppets, or try this project, which is fun for students in grades 3 and up.



MATERIALS

- Photocopy of large butterfly
- Pencil
- Tape
- Chopsticks
- Colored saran wrap (If you live near a lighting store, the colored gels used to cover the front of light fixtures called lighting gels are stronger and easier to work with. You can also get them online inexpensively at online stores such as Stage Spot or even more inexpensively on eBay).

PROCEDURE

1. Download the large butterfly shape at the end of this guide. Enlarge it even more on a copying machine or by hand. Photocopy the large butterfly onto card stock.
2. Cut out the butterfly shape.
3. Cut out the interior shapes (leave the black outlines).
4. Tape colored saran wrap or lighting gels over the shapes.
5. Tape a chopstick to the middle of the body.

Extension: For puppets with moving parts, cut out separate pieces, use brads to attach the pieces together, and attach a chopstick to each piece.

FOR YOUR SHOW

String a line across the classroom and hang a sheet tautly with clothespins. For a light source, use that projector you have sitting in the corner!! Perform to the haikus or point-of-view essays written in the Language Arts activity above. Encourage students to write their own puppet shows for each other or other classes.

Curriculum Focus: Dance

NYC Arts Standard: 1

Blueprint for the Arts: Dance: Dance Making

❖ FREE FORM MOVEMENTS

What child has not wanted to move like a butterfly? Sometimes all it takes is a story and some music for encouragement, and your students will create lovely motions like the fluttering of a butterfly. Since they use a lot of arm movement, you might provide light scarf-like material they can drape over their arms in imitation of wings.

1. While the children move to music, narrate this story. They begin on the floor, wearing their wings tucked in until they emerge from the chrysalis, following the clues in the narrative. To accompany the story, play guitar or recorded music.

Once there was a patch of milkweed plants. Hanging from their leaves were many chrysalides. One morning, the chrysalides begin to shake, shake, shake, then crack open. The butterflies slowly emerge and stretch their wet wings. They pump their wings up and down to dry them. Finally, they can fly! They take to the sky and soar. What fun it is to fly so freely, to drift along on the wind with other butterflies! They see a field full of flowers, and soar down to land on them. Using their proboscises like straws, they sip the nectar of the beautiful flowers. When their tummies are full,

they take to the skies again. But it is spring, and with the spring comes thunderstorms. The sky becomes dark and the wind begins to blow! It blows the butterflies backwards. Then the rain begins. They have to hide! The rain knocks them to the ground. They cannot fly with wet wings. But as fast as it came, the storm ends just as quickly. Soon the sun comes out, its rays gently touching the butterfly wings stretched out on the ground. Lightly, the butterflies begin to lift their wings again, lifting, stretching, up and down, up and down until they are back up into the sky. Now the evening is coming, and they fly home to their milkweed patch. Resting on leaves, they drift gently off to sleep. It was a very exciting first day for a butterfly! While the first stars come out one by one, they rest and dream about the new day to come.

Thanks to Emma Devine Warman, who wrote this story at age 5.

2. Below are the lyrics to the theme song by Bernie Garzia from *Butterfly: The Story of a Life Cycle*. Recite the poem while the children create movements that go with the poem.

Round...round...and round it goes
For as long as I can recall
Round like a rubber ball
Like summer into fall

Round...round...and round it goes
Like a circle with no end
From here...to here...and then
It all begins again

And it happens over and over
But it's special...every one

From life...to life...to life...to life...
And a new one's just begun!

Round...round...and round it goes
Like hello and good-bye
The sun up in the sky
Watch and you'll see why
I sing to the life
Of our butterfly
Of our butterfly
Of our butterfly
Our butterfly!

Curriculum Focus: Theater

NYC Arts Standard: 1

Blueprint for the Arts: Theater: Theater Making

❖ MINI-LESSON: DIALOGUE

Model what dialogue is and how it is written when writing a script.

With a partner, write a dialogue between a butterfly and another insect or animal. Animals dangerous to butterflies can be spiders and frogs. Usually the Monarch's colors will warn off birds and other insects. Make shadow puppets based on the characters in their dialogue. Perform the short dialogues for each other.

Web Resources

For ordering milkweed plants and seeds:

<http://www.butterflyencounters.com/> - Butterfly Encounters

For ordering Monarch Life Cycle Kits, books and videos:

<http://www.monarchmagic.com/> - Monarch Magic

For painted lady butterfly kits:

<http://www.Insectlore.com>

For pictures and video of life cycle:

<http://www.monarchbutterflyusa.com/Cycle.htm>

For activities, handouts, games, links:

www.nationalgeographic.com/coloringbook/sketch_butterflies.html

<http://www.enchantedlearning.com/subjects/butterfly/species/Monarch.shtml>

www.kidzone.ws/animals/monarch_butterfly.htm

For tracking Monarchs:

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

Journey North helps student track local Monarch populations with migration maps, pictures, standards-based lesson plans, activities and information.

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

Organize a trip to the Bronx Zoo Butterfly Garden

<http://www.bronxzoo.com/plan-your-trip/exhibits/butterfly-garden.aspx>

Bookshelf

Monarch Magic! Butterfly Activities & Nature Discoveries by Lynn M. Rosenblatt. Williamson Books, 2998.

Monarch and Milkweed by Helen Frost. Atheneum, 2008.

Hurry and the Monarch by Antoine O'Flatharta. Dragonfly, 2009.

An Extraordinary Life: The Story of a Monarch Butterfly by Laurence Pringle. Scholastic, 2001.

Monarchs by Kathryn Lasky. Gulliver Books, 1993.

Monarch Butterfly by Gail Gibbons. Holiday House, 1991.

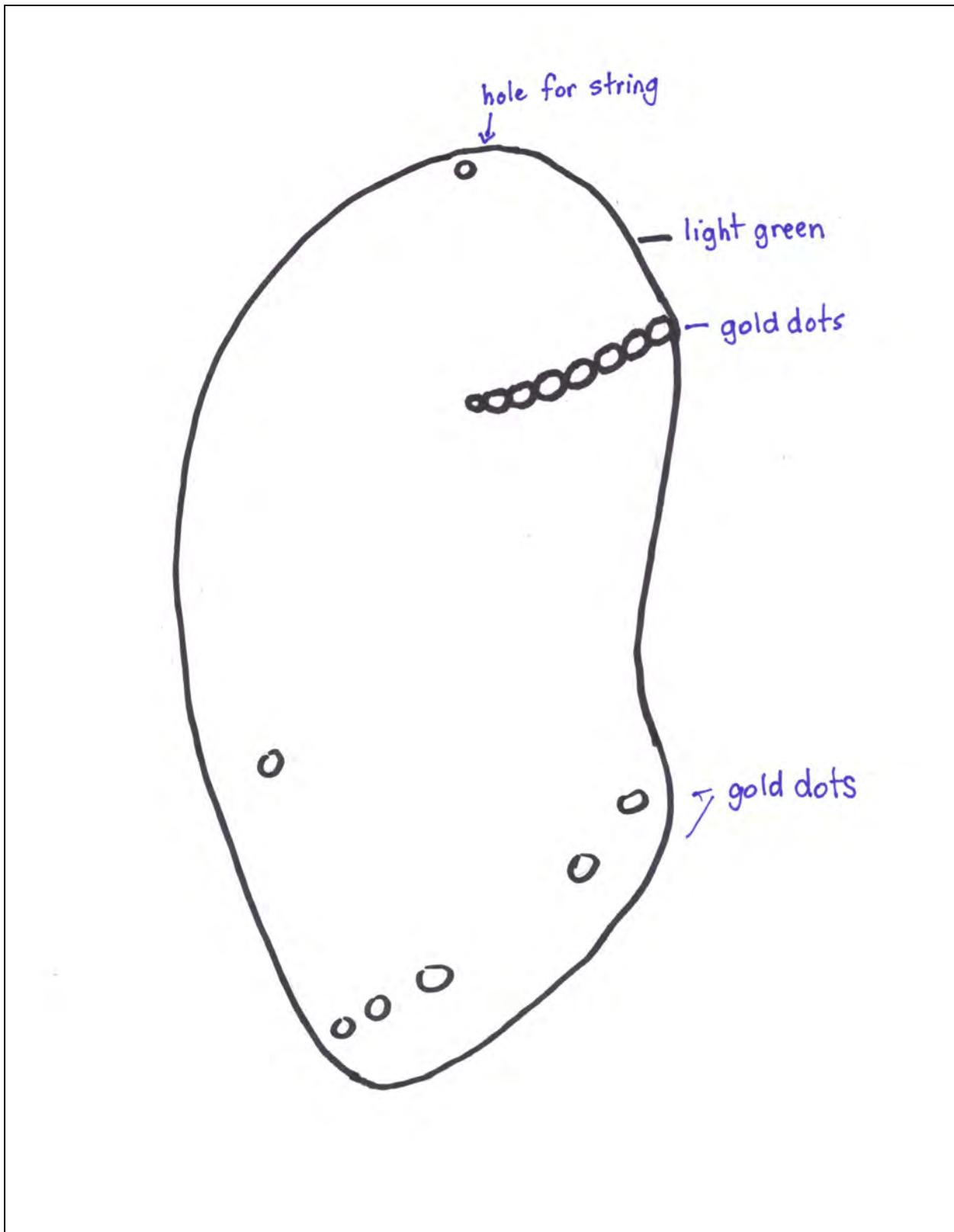
Becoming Butterflies by Anne Rockwell. Walker Books for Young Readers, 2002.

Threat to the Monarch Butterfly by Rebecca Thatcher Murcia. Mitchell Lane, 2007.

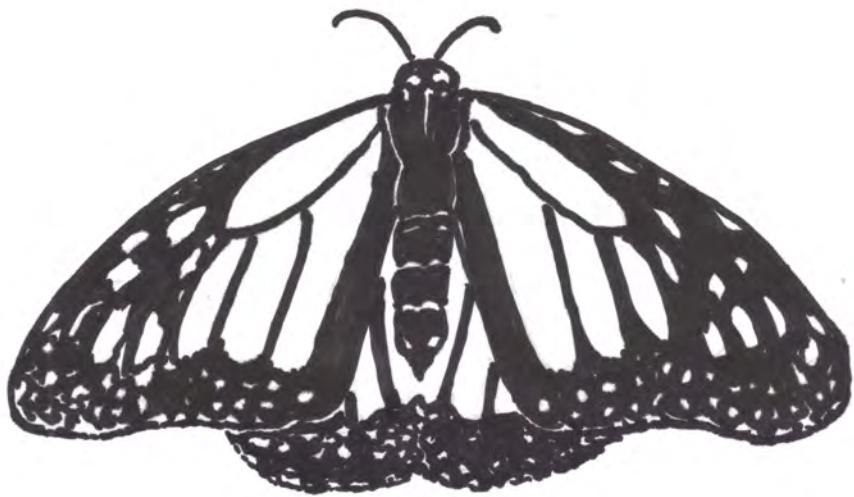
The Life Cycle of Butterflies: Teacher's Guide by Douglas Lapp. National Science Resource Center, 1992.

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CHRYsalis TEMPLATE

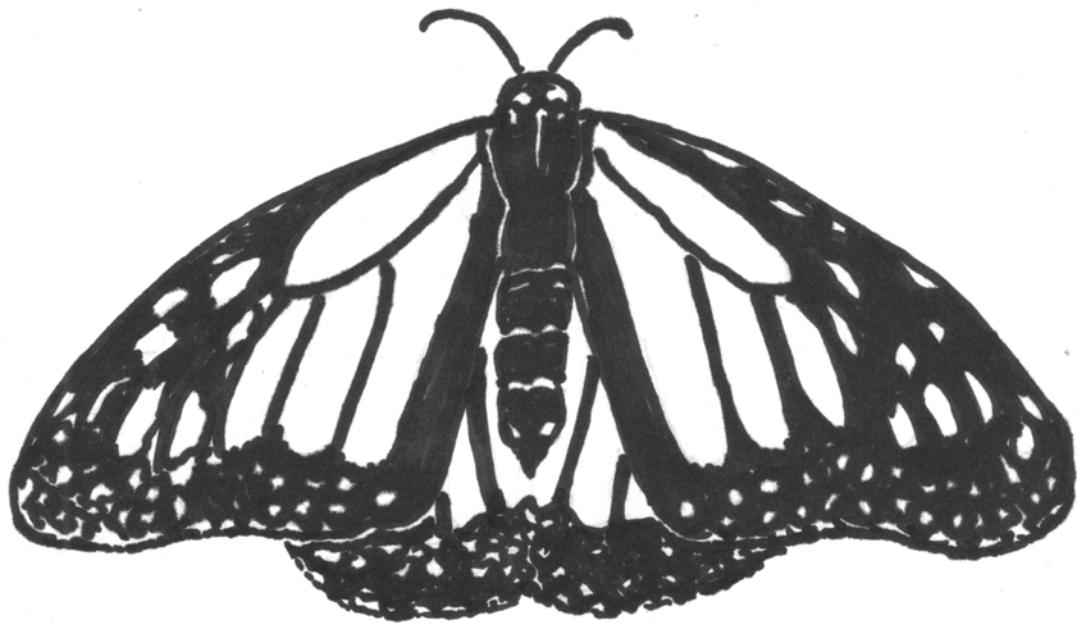


SMALL MONARCH BUTTERFLY



Large Spots color orange; small spots leave white.

LARGE MONARCH BUTTERLY



Large Spots color orange; small spots leave white.

Teacher Guide drawings by Kathy Devine.

THEATER ETIQUETTE

We are delighted to have you as our guest and want your experience to be an enjoyable one. Attending a live performance is very different from watching television or going to the movies. You are not simply watching what is happening on the stage; you play an active role. The artists have worked very hard to prepare this performance for you, so please remember the golden rule:

Treat others the way you would like to be treated.

Here are a few guidelines to help you—and your fellow audience members—enjoy the performance:

Be Prepared

- Arrive early. Please plan to arrive at the theater at least 15 minutes before curtain time. Be generous in your estimation of travel and parking time.
- Plan ahead to meet anyone in your group who travels separately. Once inside the theater, 'saving seats' for friends will only prove frustrating to all involved.
- Remember to turn off all beepers, cell phones, and watch alarms before entering the theater (And then double check!) and leave all laser pointers, cameras, etc. at home.

Be Courteous

- Walk, don't run, when entering or leaving the theater. The term "break a leg" means good luck to the performers not the audience!
- Do not take food or drink into the theater, and please – NO GUM!
- Please take children out of the theater if they become restless and disrupt other's ability to listen.
- Actors love to hear applause—it shows how much you enjoyed the performance. If you like something, applaud—if not, don't. It's rude to boo or whistle.

Be Aware

- It's ok to talk *quietly* with those sitting next to you before the performance; however, when the lights dim, it's time to be quiet and direct your attention to the stage.
- Practice the International Sign of "Quiet Please!" by **silently** raising your finger to your lips to politely remind a neighbor or friend. You communicate your wish for quiet without adding to the distraction. Excessive noise or motion can disturb not only other audience members, but the performers as well.
- Take everything you brought with you when you leave. Once the cast has taken their bows and the house lights come up, check under your seat for any items (coats, backpacks, etc) you might have placed there.

Be Open

- A good audience member is open to new sights and sounds. Enjoy!



GETTING TO AMES

Stephens Auditorium is part of the Iowa State Center located at the corner of University Boulevard (formerly Elwood Drive) and Lincoln Way in Ames, Iowa. Plentiful parking is available on all sides of the building. Please follow traffic directors' instructions if you are asked to park in a specific location. Handicapped-accessible and limited-mobility parking is available on the west side of the auditorium.

