



Roads Scholar Educational Adventures in Our Own Backyard

By Kathleen Williams
CRIZMAC Art and Cultural Marketplace

Going Eye-to-Eye with the Butterflies at Tucson Botanical Gardens

In ancient Mexico, Aztec noblemen frequently carried large bouquets of flowers, but it was considered ill-mannered for other people to sniff the bouquets from the top. The fragrant tops were reserved for butterflies, believed to be the souls of the dead returning to visit their relatives and assure them that all was well. The Maya also looked upon butterflies as the dead returning to earth. In their case, they believed the butterflies were the spirits of dead warriors in disguise.

One of nature's most beautiful, colorful, and illusive creatures, the butterfly figures prominently in the myths and legends of many cultures around the world. For the Blackfeet Indians of North America, butterflies are messengers and the bringers of dreams. It was the custom for a Blackfoot woman to embroider the symbol for a butterfly on a small piece of buckskin and tie it to her baby's hair to induce sleep. The butterfly is also a prominent figure in Hopi culture. A clan in one of the Hopi pueblos is the Butterfly Clan. The spirit of the butterfly is personified in the Hopi Butterfly Kachina figure and butterfly dances are held to ensure a good harvest. Symbolizing the bounty of summer, butterflies are found decorating prehistoric pottery, as well as traditional basketry and beadwork in many Native American cultures.

Some groups in Asia and Africa trace their ancestry to a butterfly. The men from a tribe in Sumatra claim to be descended from eggs laid by a butterfly. (Their wives, on the other hand, were sent down from above fully grown.)

Even closer to home, the Tohono O'odham have a legend that explains the beauty of the butterflies. According to the legend, butterflies used to sing but lost the ability because the songbirds became jealous. So now butterflies are beautifully colored, but silent.

The Butterfly Magic exhibit currently at Tucson Botanical Gardens offers an opportunity to see an incredible variety of these fantastic creatures. The Gardens' greenhouse is filled with over 500 free flying butterflies, so a visit is like taking a tropical vacation without ever leaving home. This year, there is a different focus each month. December will display African varieties; butterflies from Central and South America will be the focus during January and February. All of the butterflies in the exhibit come from sanctioned butterfly farms in tropical forest areas.

There is something almost magical about stepping inside this exhibit. The brilliant, winged creatures capture our imaginations, just as they have so many people before us. Butterflies are prominent figures in many myths and legends because of their beauty and power of flight, but most especially because of the remarkable physical transformation they make during their lives.

Even as babies, human beings have the same basic body structure (a torso, neck and head with two legs and two arms) that they will have as adults. This is true for many life forms, but not for butterflies. They change dramatically over their lifetimes, in four distinct stages, through a process called metamorphosis.

Life cycle of a butterfly:

1. Egg Stage: Adult females lay eggs on or near the larval food plant
2. Larval stage: Caterpillars are basically eating machines. They start out small, but grow quickly as they eat the food plant. As they grow larger, they shed their outgrown exoskeleton. Most caterpillars are full grown after 2-4 weeks of feeding. They then crawl away from the food plant to find a place to pupate—attaching themselves to a plant or other object with strands of silk.
3. Pupal stage: Within a day or two, the caterpillar sheds its skin, forming a pupal case or chrysalis. It is inside the chrysalis that the transformation from caterpillar to butterfly occurs.
4. Adult stage: When the transformation is complete, generally in about two weeks, the adult butterfly emerges.

It is this amazing transformation—more than anything else—that has given the butterfly such a significant place in the mythology of the world. For many people, the metamorphosis of the butterfly—from hairy caterpillar to brilliantly colored, winged creature—represents hope, and the potential for rebirth and positive change.

Going the Extra Mile...

Can you think of any other animals that change so dramatically during their lifetimes? (One hint: croak, croak)

Tune Up Your Mind

Look for these books and related resources

Butterflies for Kiri by Cathryn Falwell (Lee & Low, 2003)

The Butterfly by Anna Milbourne and Cathy Shimmen (Usborne Publishing, 2005)

Butterfly Boy by Virginia Kroll, illustrated by Gerardo Suzán (Boyd's Mill Press, 1997)

The Butterfly Dance by Gerald Dawavendewa (Abbeville Press, 2001)

Butterfly & Moth by Paul Whalley, special photography by Colin Keates, Dave King, and Kim Taylor (Knopf, 1988)

Butterfly & Moth (videorecording produced by CAFE for BBC Worldwide Americas, Dorling Kindersley Vision in association with Oregon Public Broadcasting)

Butterfly Eyes and Other Secrets of the Meadow by Joyce Sidman, illustrated by Beth Krommes (Houghton Mifflin, 2006)

Hurry and the Monarch by Antoine O Flatharta (Alfred A. Knopf, 2005)

The Spirit of Butterflies: Myth, Magic, and Art by Maraleen Monos-Jones (Harry N. Abrams, 2000)

Waiting for Wings by Lois Ehlert (Harcourt Brace, 2001)

For the Mouse-bound

www.tucsonbotanical.org

<http://bsi.montana.edu/web/kidsbutterfly/>

<http://www.arps.org/pe/grade1/Children's%20Butterfly%20Site.htm>

Details

What: Tucson Botanical Gardens' Butterfly Magic exhibit

Where: 2150 N. Alvernon Way

When: Daily through February 28, 2007, 10 a.m. – 3 p.m.

Closed Christmas and New Year's Day

Admission:

\$9.00 Adults

\$5.00 Children (6-12)

Free Children 5 and under

Members pay \$3.00 and \$2.00 for their children

Prices include admission to the Gardens and the Butterfly Magic exhibit

Information: 326-9686 or www.tucsonbotanical.org

Discovery Detours

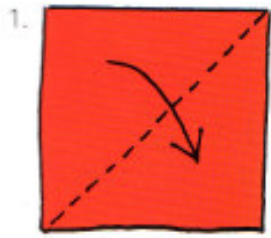
Play Butterfly Rummy

Visit http://kidscrafts.suite101.com/article.cfm/butterfly_facts_rummy and print out the cards to make and play a butterfly facts rummy game.

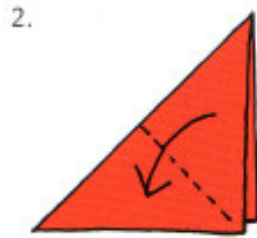
Make an Origami Butterfly

Visit www.crizmac.com and click on the "Roads Scholar link for instructions on how to make an origami butterfly.

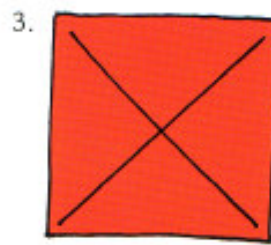
How to Make an *origami* *Butterfly*



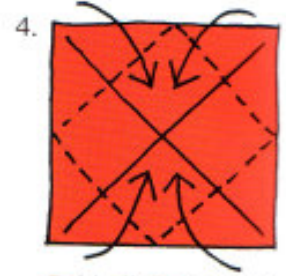
Fold a paper square in half.



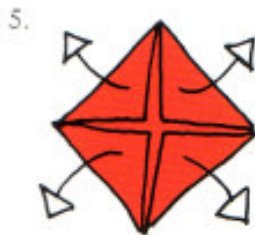
Fold it in half again.



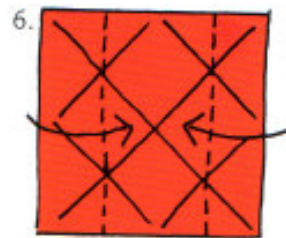
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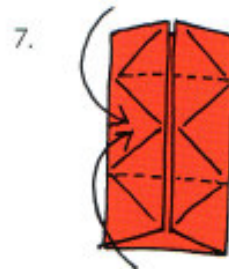
Fold all the corners to the center.



Unfold the paper again.



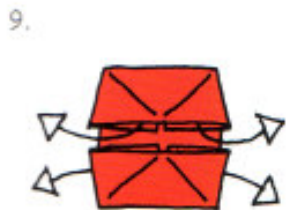
Fold the sides into the center.



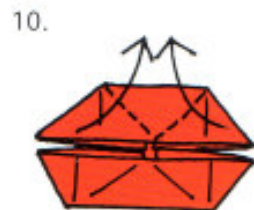
Fold the top and bottom to the center.



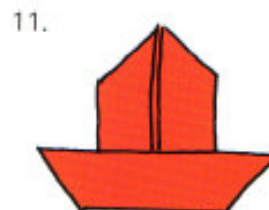
It should look like this.



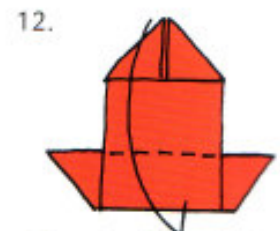
Carefully pull out the inside corners.



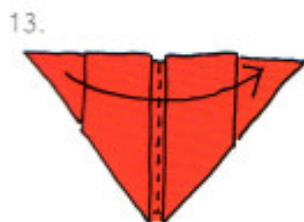
Press flat. Then fold up the top corners.



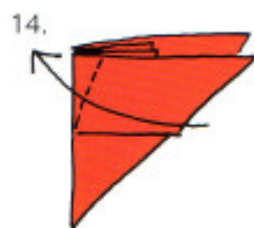
It should look like this now.



Turn it over and fold down the top.



Now fold the whole thing in half.



Open by making a small diagonal fold. Repeat on the other side.



If you go...

In nature, butterflies are threatened by several animals that would like to have them for a meal. These include bats, birds, mice, lizards, and even other insects such as large wasps. Over time, butterflies have developed various ways to protect themselves including:

- Being virtually invisible by perfect camouflage.
- Bright colors that say “Caution, I’m inedible!” to potential predators. The poison comes from plants the butterfly ate as a caterpillar.
- Fooling predators. One type of butterfly looks like a strong, defensive wasp, while others copy the colors of poisonous butterflies. This is called mimicry.
- The backs of some species look like heads with big eyes. To strengthen this impression, they sit with their real heads facing the ground. They can also scare potential predators by moving their wings and making their “eyes” flash.
- Slipping away. The butterfly’s scales are detachable, so it can easily get away if it is attacked or comes in contact with a spider’s web.

With your admission materials, you’ll receive a flyer showing many of the butterflies featured in the exhibit. How many of them can you find? What forms of protection can you identify?

Visit the Children’s Discovery Table at the exhibit for many more activities that will help you learn about butterflies.

Think Tank

Discussion questions for the whole family to consider:

The butterflies you see in this exhibit actually began their lives in farms in Costa Rica, Southeast Asia or other tropical locations. During the dormant chrysalis (or pupa) stage, they were carefully packed and couriered to the Gardens. No matter where in the world they began, they arrived in no more than a few days. The staff at the Gardens carefully unpacked them and mounted each chrysalis in a pupae chamber in preparation for its emergence.

When a butterfly emerges from its chrysalis as an adult butterfly, it is released into the greenhouse. There is a public viewing window, so if you happen to be there at the right time, you may even get to watch a butterfly emerge!

The Butterfly Magic exhibit and others like it help to protect rainforests and support global conservation efforts. How do they do this? Consider what you may already know about threats to the rainforests as well as the information provided above about how butterflies come to this exhibit. Visit www.crizmac.com and click on the “Roads Scholar” link to check your answers with what the experts say.

Information from Tucson Botanical Gardens:

The Xerces Society, the Nature Conservancy, the Wildlife Conservation Society, and many other conservation organizations are involved in projects around the world to encourage butterfly farms in areas where tropical forests are threatened with development.

All of the butterflies in the Butterfly Magic exhibit come from sanctioned butterfly farms. These commercial ventures in developing countries have been praised as “conservation on the ground.” In regions where tropical forests are threatened by logging, agriculture, and development, butterfly farms offer a way for local people to make a living by using the forest, and the animals and plants in it, instead of cutting it down.

In butterfly farms, wild butterflies are gathered in the forest and brought into netted breeding enclosures. The netting is not in place to keep butterflies in but rather to keep predators out. In the wild, fewer than 10% of butterfly eggs survive to adulthood, while captive breeding programs achieve survival rates of 70-90%. Farm workers collect the butterfly eggs, sort and label them and when the caterpillars hatch, they place them on their specific food plants. When the caterpillars enter the chrysalis stage, most of the pupae are sent to distributors for shipment to butterfly houses around the world, while the rest are kept for breeding or released back into the wild.

Fuel for Thought

Did you know...

- Butterflies and moths are insects belonging to the order Lepidoptera, which means “scaly winged.”
- Butterfly wings are covered with tiny scales, each a single color
- Butterflies breathe through openings in their abdomens called “spiracles.”
- Butterflies and other insects have their skeletons on the outside of their bodies. These “exoskeletons” protect them from predators and keep water inside their bodies so they don’t dry out.
- Many butterflies can taste with their feet. This helps them decide where to lay their eggs by determining if a leaf will be good food for caterpillars or not.
- A butterfly uncoils its long, straw-like proboscis to sip nectar from flowers, juice from rotting fruit and water from puddles.
- When a butterfly emerges from its chrysalis, a red liquid comes out of the butterfly’s abdomen. This is not blood, as many suppose, but metabolic waste material left over from the process of metamorphosis.
- Many species of butterflies migrate to avoid adverse conditions. Most migrate only short distances, but some—like the Monarch Butterfly—migrate thousands of miles.
- Antarctica is the only continent on which no butterflies have been found.
- There are more types of insects in one tropical rainforest tree than in the entire state of Vermont.
- The greatest threats to butterflies are habitat change and loss due to residential, commercial and agricultural development.

Wheels Are Turning

Parents and Caregivers: These activities can help your child meet Arizona’s educational standards. The standards addressed here include:

4SC-R3. Recognize and distinguish similarities and differences in diverse species. (K)

4SC-F2. Trace the life cycles of various organisms (Grades 1-3)

4SC-F4. Identify characteristics of animals that allow them to live in specific environments. (Grades 1-3)

4SC-E7. Explain the interaction and interdependence of living and non-living components within eco-systems, including the adaptation of animals to their environments. (Grades 4-8)