

PLUGGED IN

FUN FOR KIDS

A COOPERATIVE PROJECT OF THE SANTA BARBARA NEWS-PRESS AND THE MUSEUM EDUCATORS' ROUNDTABLE TO PROMOTE LEARNING AMONG YOUNG READERS IN NATURAL SCIENCE, HISTORY, TECHNOLOGY AND ART.

This Month's Theme: Pollination

Pollination

By Connie Buxton, Ganna Walska Lotusland

Flowers attract pollinators, which move pollen from the male part of the flower to the female part. After pollination, the plant can produce seed and reproduce. Most pollinators are winged insects and, as they fly over the landscape, they are attracted to the bright colors and patterns of flowers. Different insects are attracted to different colors and shapes. For example, bees cannot see red, but they can see ultraviolet, which humans cannot see. They can also see "bee guides," patterns that guide bees to the flower's nectar, many of which humans cannot see. Night pollinators (like moths and bats) are attracted to sweet scented white or very light colored flowers that are easily seen by moonlight.

Cycads are very ancient plants whose ancestors were here when dinosaurs roamed the earth. There are male cycad plants and female cycad plants, and they each produce cones that look similar to large pine cones. Male cycad cones produce pollen. Lotusland's cycads are not native to our area and are from different countries around the world. Our native insects are not attracted to the pollen and do not visit the plants to help move pollen from one plant to another. Humans must do that for them. Cycad specialist, Jeff Chemnick, pol-



Jeff Chemnick hand-pollinating Cycads. Photo courtesy of Ganna Walska Lotusland.

linates cycads by hand. He collects pollen from the male cone and mixes it with water to make a "slurry." He then injects the slurry into the female cone at just the right time. If he is successful, the female cone will produce up to 200 seeds that can be planted to produce new cycads.

Hummingbirds among the Natives

By Sally Isaacson, Santa Barbara Botanic Garden

California native plants are displayed in their natural setting at the Santa Barbara Botanic Garden. This is a great place to watch our local pollinators at work. Sit on a bench in the Meadow and watch bees, butterflies, moths, flies, beetles, and hummingbirds flutter, fly, crawl, and zoom as they move busily from flower to flower. Watch a particular plant, and you will see that certain pollinators visit it. Fix your eyes on another type of plant, and you may discover that its visitors are entirely different. It looks like such a quiet peaceful place to us humans, but the pollinators are busy at work at all times of year trying to find nectar and pollen. Plants depend on these pollinators. If pollen is not moved from flower to flower, the flowers may not produce seeds. Some types of flowers are not dependent on animals for pollination, and air and water currents pollinate their flowers. These plants usually have much less colorful and exciting flowers.

In California we have several species of native hummingbirds, and in Santa Barbara we have one species,

Young Hummingbird. Photo courtesy of Santa Barbara Zoo.



Anna's Hummingbird, that stays here all year round. This beautiful little bird is often seen at the Botanic Garden and in hills and valleys around our county. It builds tiny nests and lines them with spider webs and the fuzz that it gathers from underneath leaves of Western Sycamore trees. It moves at high speed, using a huge amount of energy as it flaps its tiny wings many times each second. Moving from flower to flower in search of nectar, it must find this sugary liquid all year round.

Hummingbirds are especially attracted to red flowers. Their eyes see pretty much the same way as human eyes. Insects are not attracted to red at all, as their eyes work quite differently. When bees and butterflies fly over a plant with green leaves and red flowers, the two colors do not even seem different or exciting to them. It is as though they are flying over a black and white newspaper instead of a very colorful page like the one that you are reading now.

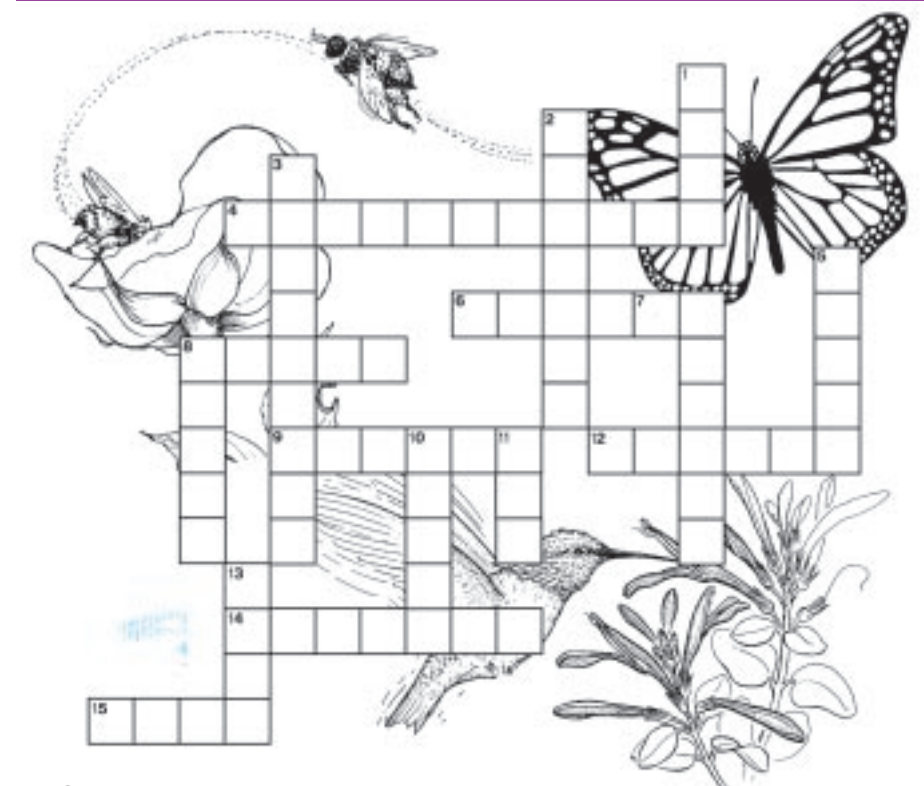
If you watch hummingbirds at the Botanic Garden or in a wild place near here, you will see that they often visit bright red tube-shaped flowers. These flowers each contain a lot of liquid nectar. Santa Barbara County has many different wild plants that have bright red tubular flowers, and these all depend on hummingbirds to pollinate them. At every time of year there is a wild plant in bloom with flowers that seem perfectly designed for hummingbirds. Botanists think that these plants and our hummingbirds have evolved side by side for many thousands of years and are now totally interdependent. Be a junior botanist and do an experiment by learning the names of these plants and writing down on your calendar which month each one flowers. See if you can predict where the Anna's Hummingbird will go for its food during each season.



Hand-colored graphics courtesy of S.B. Botanic Garden.

Pollination Puzzle

By Sally Isaacson and Don Matsumoto, Santa Barbara Botanic Garden



DOWN

- Some flowers do not have animal pollinators. Their pollen is moved by currents of _____ or water.
- Long _____ flowers allow hummingbird beaks to sip nectar.
- The orange and black Monarch _____ is common in this area.
- _____ are like butterflies, but they usually fly at night.
- Hummingbirds and moths sip sugary _____ from flowers.
- If pollination is successful, _____ will develop inside the fruit.
- Moths fly at night and are attracted to bright _____ flowers because they show up in the dark.
- Hummingbirds can see _____ colored flowers but insects can't.
- Some flowers are pollinated by flying mammals called _____.

ACROSS

- Some types of _____ flap their wings about 52 times each second.
- The anthers of flowers produce _____. It looks like yellow dust.
- Nectar tastes _____.
- Petals may have colored dots or stripes that lead pollinators to the center of the _____.
- _____ are the colored parts of flowers that attract pollinators.
- _____ are at the top of the stamens and they produce the pollen.
- _____ produce honey and collect pollen to feed to their young.

ANSWERS ARE BELOW.

9. Flower, 12. Petals, 14. Anthers, 15. Bees.
8. Seeds, 10. White, 11. Red, 13. Bats, ACROSS: 4. Hummingbird, 6. Pollen, 8. Sweet, PUZZLE ANSWERS, DOWN: 1. Wind, 2. Tubular, 3. Butterfly, 5. Moths, 7. Nectar,

GET connected connected

GET CONNECTED WITH THE MEMBERS OF THE MUSEUM EDUCATORS' ROUNDTABLE:

Channel Islands National Marine Sanctuary
805-966-7107; www.cinms.nos.noaa.gov

Outdoors Santa Barbara Visitor Center open daily from 11am to 6 pm.

Santa Barbara Mission Museum
805-682-4149

Tour includes historical art, artifacts, gardens, church and cemetery. Children free, Adults \$4.

Santa Barbara Trust for Historic Preservation
805-965-0093; www.sbthp.org

Encourages the preservation and interpretation of historic buildings and sites in Santa Barbara County

Santa Barbara Botanic Garden
805-682-4726; www.sbbg.org

Family Nature Night. Fri., Aug. 17, 6:30-9:00 pm. Discover the night-time secrets of animals and plants at the Garden. Includes pizza dinner. Call for fee & other details. Pre-registration required.

Channel Islands National Park
805-658-5730; www.nps.gov/chis

Tidepool Programs Saturdays and Sundays, 11 a.m. Ventura Visitor Center

Ganna Walska Lotusland
805-969-3767; www.lotusland.org

Promoting Plant Conservation, Education, and Preservation

Goleta Valley Historical Society
805-964-4407; www.goletahistory.org

SATURDAY AND SUNDAY TOURS AT 2PM AND 3PM.

Santa Barbara Historical Society
805-966-1601

To promote an appreciation and understanding of Santa Barbara regional history and the importance of history in general.

Santa Barbara Museum of Natural History
www.sbnature.org; 805-682-4711;

Enjoy a WET and WILD summer of FUN at our Sea Center on Stearns Wharf!

Santa Barbara Zoological Gardens
805-962-5339
www.santabarbarazoo.org

Be sure to visit the Zoo's Theater Gaze Wild program debuting this summer. Performances are free with admission.

Santa Barbara Contemporary Arts Forum
805-966-5373; www.sbcaf.org

Under 12? Hang one of your artworks for free in the Focused on the Forum exhibition. Aug. 25, 9 a.m. - 1 p.m.

South Coast Railroad Museum
805-964-3540; www.goletadepot.org

Open Wed. through Sun. 1 to 4 pm. 300 N. Los Carneros Road, Goleta. Come Ride the Train!

Art From Scrap
805-884-0459
www.communityenvironmentalcouncil.org/afs

Art From Scrap Parking Lot Sale, Sat., Aug. 18, 10 am-4 pm. 302 E. Cota St. (corner of Garden St.) Santa Barbara

Karpeles Manuscript Library and Museum
805-962-5322

The world's largest private holding of important original documents and manuscripts.



Visit the S.B. Museum of Natural History to learn more about butterflies and pollination. You can walk among live butterflies until Sept. 10.

Hummingbird "Wows"

By Connie Buxton, Ganna Walska Lotusland

- Cuban "bee hummingbirds" weigh less than a penny.
- Hummers can fly 40 mph, and their wings beat 52 beats per second!
- Speed is what hummers are all about, and they need an incredible amount of energy. If a human used energy at a hummer's rate, every day he would need to eat nearly 40 ten-pound sacks of potatoes or more than 1,000 quarter pounders. Even if he didn't get indigestion, he would be unable to shed all the heat generated by burning so much food. He would quickly use up all the moisture in perspiration, his skin temperature would rise to 750 degrees, and he would burst into flame!
- Hummers may consume over twice their weight in nectar every day, as well as many small insects and spiders.

