WILD KRATTS
MONARCH BUTTERFLIES
OVERVIEW

In this activity, students will raise Monarch butterflies, tag them, and learn about the Monarch butterflies yearly migration. They will have opportunities to observe Monarchs and other nonmigratory butterflies outside and even plant and maintain their own butterfly garden.

Skills: Making observations; collecting and recording data; care of plants and animals
Range: Grades 1-3

THE SCIENCE IDEA

Migration is an adaptation that helps many animals survive. Everyone knows mammals and birds migrate, but it is important to know that even insects make migrations south to warm weather during the cold weather months in the north. These flights require a lot of energy and butterflies stop often along the way to rest and find food. By planting and maintaining butterfly gardens, we can all help migrating Monarchs and non-migrating butterflies find the food they need to survive. We can also observe the physical appearance of butterflies that come to the garden and which plants they prefer to feed on.
WHAT TO DO

RAISING MONARCHS

What you will need:

1. Monarch caterpillars or eggs - a renewable, fresh supply or potted milkweed
2. Clear plastic containers with an open top (upright containers are best if you are rearing Monarch from eggs)
3. Fine wire mesh and elastics to secure the mesh to the open top of the container

Directions:

1. Obtain Monarch eggs or caterpillars either by collecting them as a class or by ordering a kit online (see local distributor, for example: http://butterflybushes.com/butterfly_rearing_kits.htm or http://shop.monarchwatch.org/). Collection can start in late August for September classes, or the middle of June for summer studies. If you are collecting yourself or as a class it will be important to look for a location with a lot of milkweed. Butterfly eggs are small white capsules attached to the undersides of leaves and on the stalk. It is important to remember that Monarch butterflies only lay eggs on milkweed. Similarly, Monarch caterpillars will only live on milkweed. Be sure to collect fresh milkweed as well. You will need newly collected milkweed leaves every two days for the remainder of this project.

2. Have the students wash the plastic containers with water (no soap) and dry them carefully. Cut the wire mesh in the shape of the container opening. Place some of the milkweed in the container. If you are rearing Monarchs butterflies from eggs, be sure to use an upright container and keep the stalks of milkweed that have the eggs in an upright position. If you are rearing Monarch butterflies from caterpillars, be sure to include a nice layer of milkweed leaves for food.

3. Once there are caterpillars in the rearing cage, it will need to be cleaned every two days. Have students remove the caterpillars carefully (they will probably be eating a leaf in which case you can remove the leaf itself, they will hang on). Then dispose of the old leaves and excrement pellets, wipe the container clean with water (no soap) and dry it carefully. Put fresh milkweed leaves (new cuttings) in the container and replace the Monarch caterpillars. It will take about ten days before the caterpillar will go into chrysalis so this process will be repeated at least five times. During this period the caterpillars will grow to two thousand times their hatching size. Have the students record the changes they see in the caterpillar (length, weight, colour, size, form) at every cage cleaning. Create graphs of the caterpillar’s development.
WHAT TO DO

RAISING MONARCHS (CONTINUED)

4. When the caterpillar is ready to pupate (go into the chrysalis form), it will form a silk attachment to the wire mesh and hang upside down in a J shape. The transformation will happen over a period of minutes. If it happens during class hours, be sure to have the students record their observations prior and during the transformation. A video recording can also be used to examine the process more slowly and in depth.

5. The chrysalis period will last approximately fourteen days. During this time, the case will change in colour and clarity. Have the students draw and record the changes.

6. The adult butterfly will emerge between ten and fourteen days later. As the adult comes close to being ready to emerge, the chrysalis casing will become increasingly clear and the butterfly's wings will be visible through the case. Adults usually emerge mid morning. Some Monarchs die in the pupa stage. If your chrysalis has been very dark for over forty-eight hours, it has probably died. Once the adult has emerged, it will remain still for some time while the wings inflate and dry. It is important not to touch the butterfly at this time. One exercise would be to have the students shout out changes that they observe in the butterfly's appearance as it changes after emerging. These can be recorded on the board, or a large sheet of paper with an outline of a butterfly drawn on it. Place each observation on the correct place on the outline (i.e.: An observation about the wings would be written on the wings of the outline).

7. Finally, once the adult butterfly has inflated it's wings and dried, it can be handled carefully. Always hold all four wings at the same time to avoid damage from the butterfly struggling. The adult must be released the same day, so be sure to either release the butterfly outside, or begin the second lesson, “Tagging Monarchs.”
**TAGGING MONARCHS**

What you will need:

1. A Monarch butterfly tagging kit (including tags, a data recording sheet) from Monarch Watch (http://shop.monarchwatch.org/category.aspx?c=tagging_kits%28base%29)
2. Pens
3. Clipboards
4. Adult Monarch butterflies

Directions:

1. The time of year to tag and release Monarch butterflies is in late August to mid September.

2. Have the students prepare their tagging kits (tags, data recording sheet, pen, clipboard) and bring their kit and container with the adult butterfly outside for release.

3. Each team should elect a member to gently and carefully catch and remove the adult from the plastic rearing cage.

4. A second member can place a tag on the bottom hind wing of the Monarch and press firmly by pressing the two hind wings together. Do not push on the hind wing with just one finger as it can rip.

5. A third member can record the number on the tag, as well as the date, sex of the Monarch (if known), status (reared or wild), and tagging location. These tagging sheets will returned to the Monarch Watch offices at the University of Kansas where the data will be recorded and put into a database with all the tagging data from around the US and Canada.

6. Finally, once the data has been recorded, students can release each butterfly and watch as it flutters away.

7. Weekly updates on tracking the migration can be monitored here: http://www.learner.org/jnorth/monarch/. The students are also able to report sightings of returning Monarchs here: http://www.learner.org/cgi-bin/jnorth/jn-sightings. At this time, prepare a picture show and discussion of the over-wintering site that is specific to your geographic location. For Monarch butterflies east of the Rockies, the over-wintering site is the Oyamel forests of Mexico. For Monarchs west of the Rockies the over-wintering sites are in the Eucalyptus trees that line the western coast of Mexico. students can colour maps updating the new data about returning Monarch butterflies each week. In the late spring, all the Monarchs will have returned. At this time, the students can review the entire migration from start to finish.
**TAKE IT FURTHER**

**GROWING A BUTTERFLY GARDEN**

Extend learning with additional ideas for your classroom

What you need:
1. Window flower boxes
2. Soil
3. Some butterfly nectar plant seeds or seedlings (ex: butterfly bush, marigold, common milkweed). Note that these should be specific to your geographic location.

Directions:
1. Prepare the boxes. Have students form groups of four or more. Each group receives one flower box filled with soil and three to four packages of seeds or seedling. Have the groups plant each different plant with equal spacing in between each. Follow the instructions from the nursery for planting seeds or seedlings.
2. Water and maintain the flower boxes. As time passes have a schedule for regular watering and maintenance of the flowers. Encourage students to record the growth and colours of the plants as they grow. If possible place the flower boxes on the window sill outside the classroom for easy observation. If not organize to have the students place the boxes outside close by so regular observations can be made under teacher supervision.
3. Encourage students to record the butterflies that they see feeding on the flowers in their butterfly garden. Have regular observation sessions and record the data students report on number and colour of butterflies they see feeding on their garden. This can be supplemented by showing pictures of the butterflies who enjoy specific plants the students have planted and encouraging them to continue to look for these species when they are outside at home or with their parents. (See the site: http://www.thebutterflysite.com/butterfly-food.shtml) for specific butterfly/plant interactions.
MORE WAYS TO DISCOVER AND LEARN

GO ON AN ADVENTURE: OBSERVING BUTTERFLIES

What you will need:
1. worksheet with traced outlines of butterflies
2. crayons for colouring in the colours and patterns of the butterflies the kids observe

Visit a city garden to observe butterflies and caterpillars. How many different colours and patterns of butterfly wings can the students observe? Have the students colour and copy the pattern of as many different kinds of butterflies as they can observe. Take along a butterfly guide like Peterson First Guide to Butterflies and Moths and see if the students can identify some of the butterflies by the colours and patterns they have recorded. Try to identify plants that butterflies might be attracted to for food such as milkweed, golden rod, etc. Note: Butterfly identification can be hard. Seeing butterflies and recognizing food sources can be challenging. Be sure to have students observe quietly as noise and movement can disturb butterflies. Many city gardens may have naturalists who can accompany you. As well, the local college or university may have a butterfly expert who could guide you to the best places to make observations. Find out if any parents are gardeners; they may be helpful in identifying different plants in the butterfly garden.

LITERACY CONNECTION

Create a journal of butterfly observations over time that include the colour and pattern observations the students made during the Adventure outing. Include the list of identified butterflies from the outing. Have students make and label drawings of some butterflies that are native to the region (these can be found in the butterfly field guide). Have the students write down descriptions of the butterflies they see outside at home or with their parents. Add these drawings and descriptions to the journal on a regular basis. Keep the journal in the classroom library for students to read and talk about.
NEW WORDS

Migration: The movement of animals from one place to another on a regular basis
Generation: The act of producing offspring (i.e.: the new generation(s) of Monarchs will migrate back to North America from Mexico)
Proboscis: A long tube that is used by the butterfly to eat and drink
Wing: A body part used for flying
Chrysalis: A pupa of a moth or butterfly enclosed in case or cocoon
Pupa: An insect in the inactive stage of development (when it is not feeding) intermediate between larva and adult stages

LOOK IN A BOOK

Use these books to help students learn about the habitat and behaviour of butterflies as well as the progression from caterpillar to butterfly:
Where Butterflies Grow (Picture Puffins) By Joanne Ryder. Illustrated by Lynne Cherry. Puffin

OTHER RESOURCES FOR TEACHERS

All about Monarch butterflies: http://www.monarchwatch.org/index.html
Wildlife migration including Monarch butterflies: http://www.learner.org/jnorth/
http://www.learner.org/jnorth/tm/monarch/GuidedTour_RoadMap1.html
Identifying different species of butterfly: http://www.discoverlife.org/mp/20q?guide=Butterflies