



Raising Monarch Butterflies

A Handbook for Families

PREPARED BY OAK LEARNERS & LAKESHORE MOMS



Introduction

THE MONARCH BUTTERFLY LIFE CYCLE

Raising monarch butterflies can be an exciting and rewarding activity for families and classrooms alike. There is so much to learn when you start exploring the world of insects, pollinators and eco-conservation. Despite the ease and popularity of raising monarchs, we must remember that first and foremost these are wild animals, sensitive to their environments and deserving of respect and consideration for their place in the circle of life. As such, this booklet will also include some best-practices to guide your monarch discovery.

It's quite simple to raise and release Monarch Butterflies since they require very little. In fact, the caterpillars will only eat Milkweed, thus only require fresh leaves to eat for the 10-14 days before they pupate. The caterpillars go through five stages of growth and this can be a fascinating process for little children to watch something grow so much in such a short time, not to mention the beauty of the chrysalis and the wonder of the butterfly at the end of the cycle.

Monarch Butterflies are beautiful but also represent one of the greatest mysteries of the insect world since for a very very long time, no one knew (or asked the question) what happened to the monarchs in the winter. Upon the discovery of their over-wintering site in central Mexico, the investigations and conservation efforts to save this endangered insect have grown exponentially. With the growth in awareness of the importance of Monarchs to our crops, the interest in home-rearing these insects has grown too.

We hope you enjoy raising and observing Monarch Butterflies as much as we do! It's something that every child should have the opportunity to participate in at some point in their education. The lessons learned from observing the natural world around are invaluable for children as they grow up to become the future conservators of our world.

Growing Up a Monarch

Step 1

Parents lay eggs on underside of milkweed's young leaves.



Step 2

Eggs hatch into larvae, feed on milkweed.

Step 3

Larvae go through five instars (stages) of growth as caterpillars.



Step 4

Caterpillar enters pupation stage. Hangs from horizontal section of plant.

Step 5

Caterpillar encases itself in its chrysalis.



Step 6

Butterfly emerges 2 weeks later.



The Egg

THE MONARCH BUTTERFLY LIFE CYCLE

Monarch butterfly eggs are somewhat difficult to find in the wild. Since it only takes 3-5 days for eggs to hatch, timing is crucial and multiple visits to the same milkweed patch will provide varied results.

The best sign is to watch for adult Monarchs stopping at milkweed plants. A female will usually lay only one egg per milkweed plant to ensure enough food for each larva. The egg is usually laid on the underside of the leaf, and females prefer young plants.

If you do find an egg, it is best to collect the entire plant, and put its stem in water as soon as possible. If necessary, you can just take the leaf on which it is resting.

Keep the plant stem in water. It may last longer if you cut the end of the stem just before putting it in water. If you have just taken the leaf, keep it on a moist paper towel in a clean container. Keep the container covered to maintain modest moisture. Check each day and add water a drop at a time to the filter paper if necessary.

The top of the egg will look dark just before the larva is ready to emerge. Be sure to have a fresh milkweed leaf in the container for the new larva, if its old leaf is dry.





The Larva (Caterpillar)

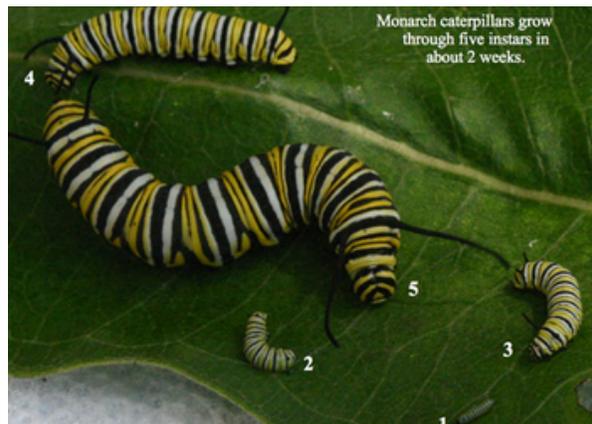
THE MONARCH BUTTERFLY LIFE CYCLE

Once the larvae emerge, they will need fresh milkweed leaves. They won't eat any other plants, although they do eat many different species, or kinds, of milkweed. If the original plant is still fresh, it is easiest to just leave the larvae on this for a few days.

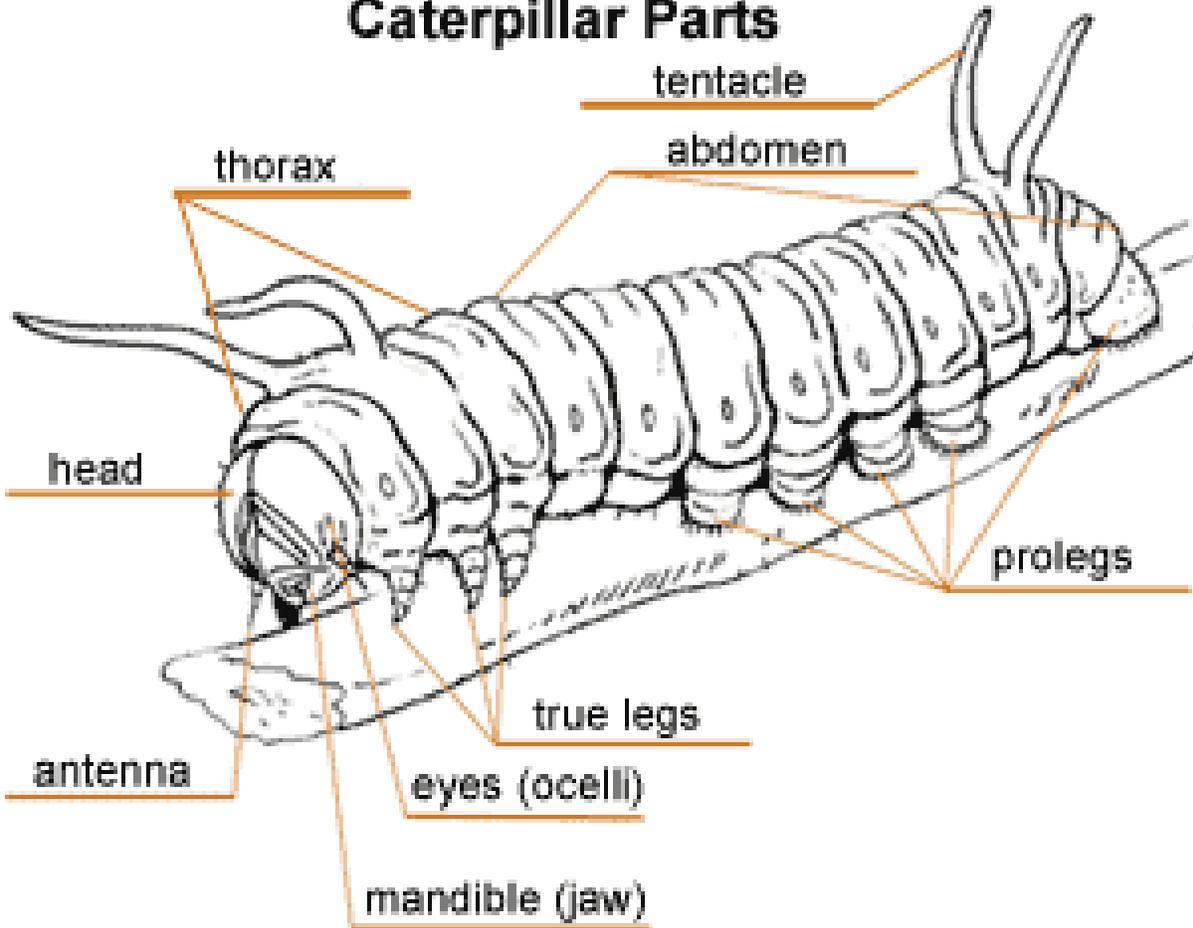
Caterpillars rarely crawl far during this time. If you are keeping larvae in individual containers, be sure to replace leaves when they turn dry, every one to two days. Leaves will keep longer if the stem is wrapped in a moist paper towel and then wrapped in tin foil or plastic wrap. Containers should be emptied of frass (larva waste) every one to two days.

Larvae can be handled safely with fingers after they are about three to four days old, but it is best to handle them as little as possible until they are over an inch long. Larvae of any size should not be handled when they are molting. They are getting ready to molt when they remain very still, often on the side or top of their container, and when you can see their black head capsule about to come off. Just after they have molted, their tentacles will look droopy, and you may see the old skin behind the larva. They will usually eat this skin!

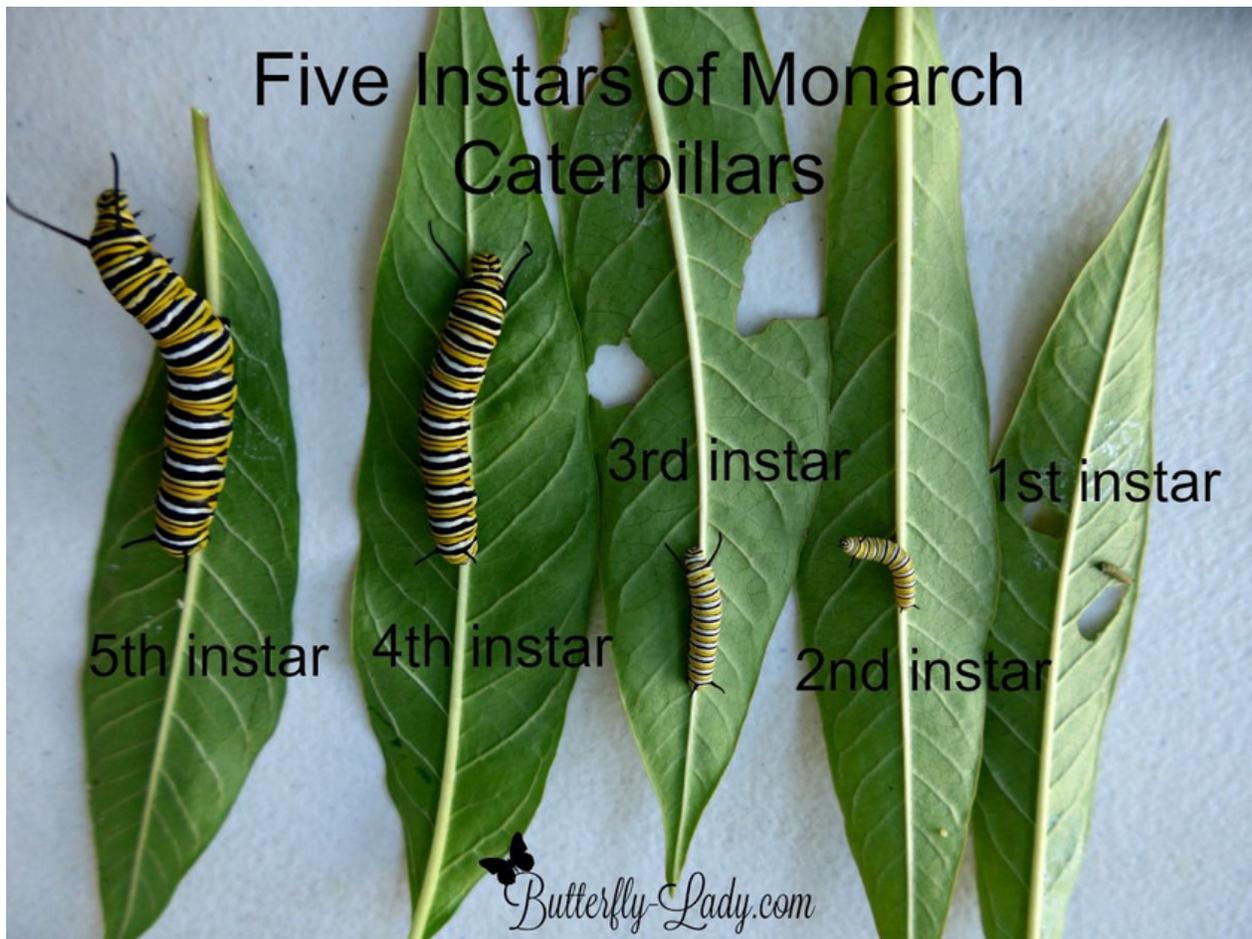
As larvae grow, so will their appetites. Be sure to check their leaf supply regularly. Be sure the upper surface is flat for easy attachment for pupating. Many types of containers can be used; clear or screen sides make it easier for students to see the Monarchs. Examples of good rearing containers include jars or cups with lids with holes, or covered with netting held on with a rubber-band. Ice cream buckets with a net rubber-banded over the top also work well, as do aquaria with screen tops. Feel free to use your imagination!



Caterpillar Parts



Five Instars of Monarch Caterpillars



Milkweed: The Lifesource of the Monarch Butterfly

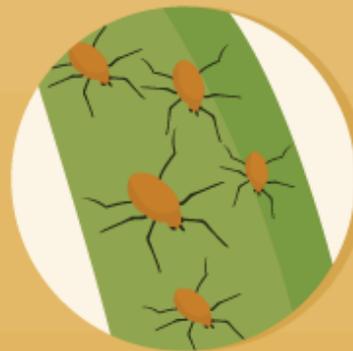


Flowers in spherical clusters of pinkish purple.

The plant grows up to six feet tall and has long, thin, rigid stems.

Contains natural latex with alkaloids (nitrogen-based, drug-like chemicals) and cardenolides (a natural steroid and poison).

Caterpillars eat leaves in circular fashion, to keep from getting stuck in latex



Often, milkweed attracts aphids

Never fear, ladybugs eat aphids





The Pupa (Chrysalis)

THE MONARCH BUTTERFLY LIFE CYCLE

When larvae are ready to pupate, they crawl to the top of their cage, attach themselves with silken thread, and form a prepupal "J" before shedding their skin for the last time. They usually hang in a "J" for up to 24hrs before pupating. This process is fun to watch but it happens very quickly! You can tell that they will shed their larval skin soon (within minutes) when their tentacles hang very limply and their bodies straighten out a little.

The pupa must hang, however, for the butterfly to form properly. The adult will emerge in 10-14 days. When it is ready to emerge, the adult wings will be visible through the pupa covering. Usually, the adult will eclose from the chrysalis in the morning sunlight, giving plenty of daylight and sunshine to help dry their wings.

Did you know that a "cocoon" refers to the pupa stage of both moths and butterflies, but only butterfly pupa are called a "chrysalis"!

Moving the Chrysalis (optional)

If desired, you can move the pupa after it has formed. Wait until it is hard and dry (several hours or longer). Tie a piece of thread around the cremaster and with a needle or pin carefully tease away the silk that is holding the pupa to the surface. Leave the silk attached so the thread does not slip off. If the pupa has fallen and there is very little silk remaining, add a drop of glue to the thread where it surrounds the cremaster. The loose ends of thread can then be tied through a hole in the container cover or through a space in the netting. Clothes pins can also be used to hold the loose end of the thread to a ring stand or other similar object. It is alright to handle the pupa carefully and even set it on a table for a minute.

Excerpt taken from monarchwatch.com





The Adult Butterfly

THE MONARCH BUTTERFLY LIFE CYCLE



Adults usually emerge in the mid-morning. When the pupa is very dark and the orange and black wings are visible, check it often to increase your chances of observing this amazing event.

NOTE: Some Monarchs die in the pupa stage. If your pupa has been very dark for over 48 hours, it is probably dead.

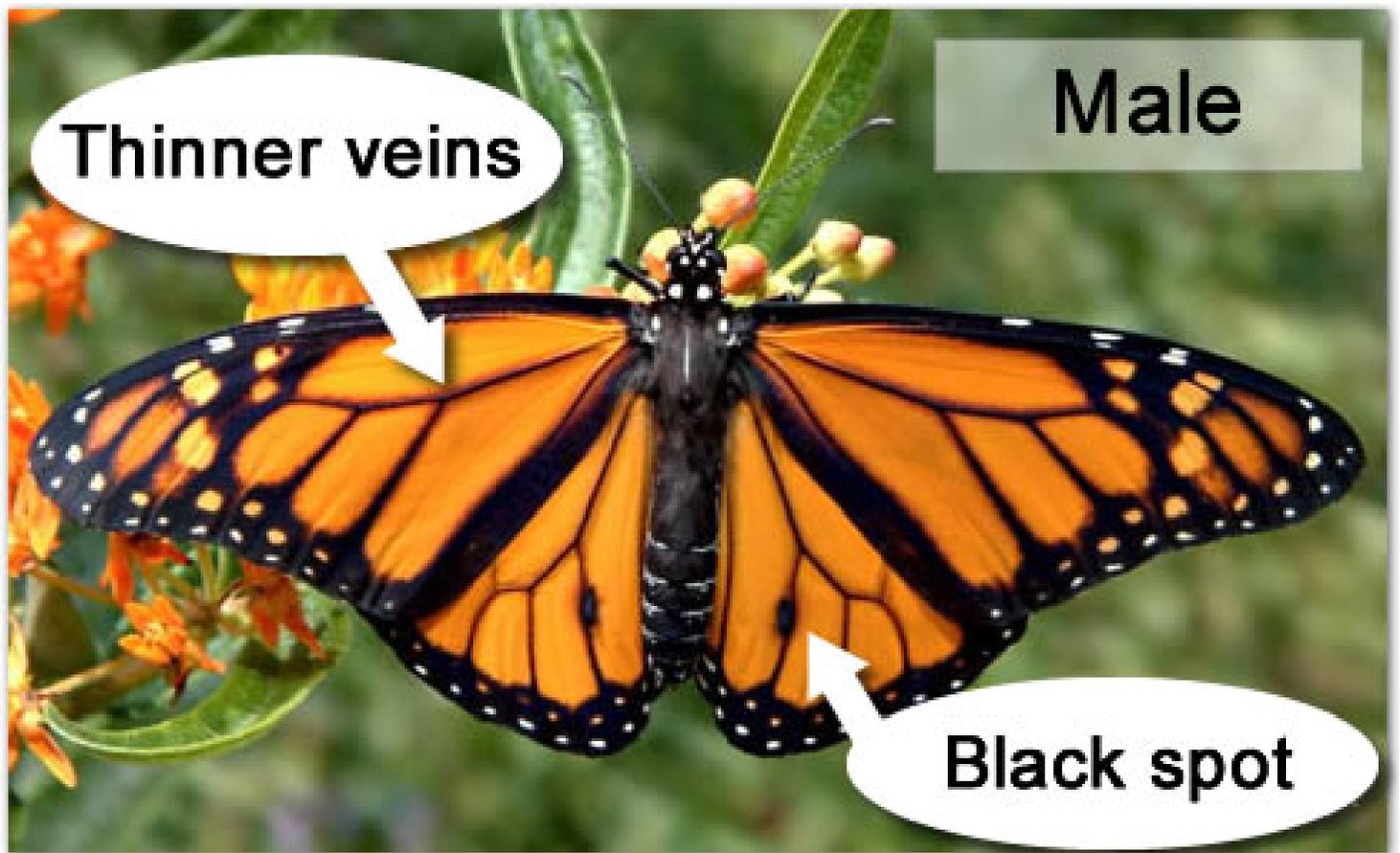
Allow the newly emerged adult plenty of time to inflate its wings and for the wings to dry before handling (3-4 hours).



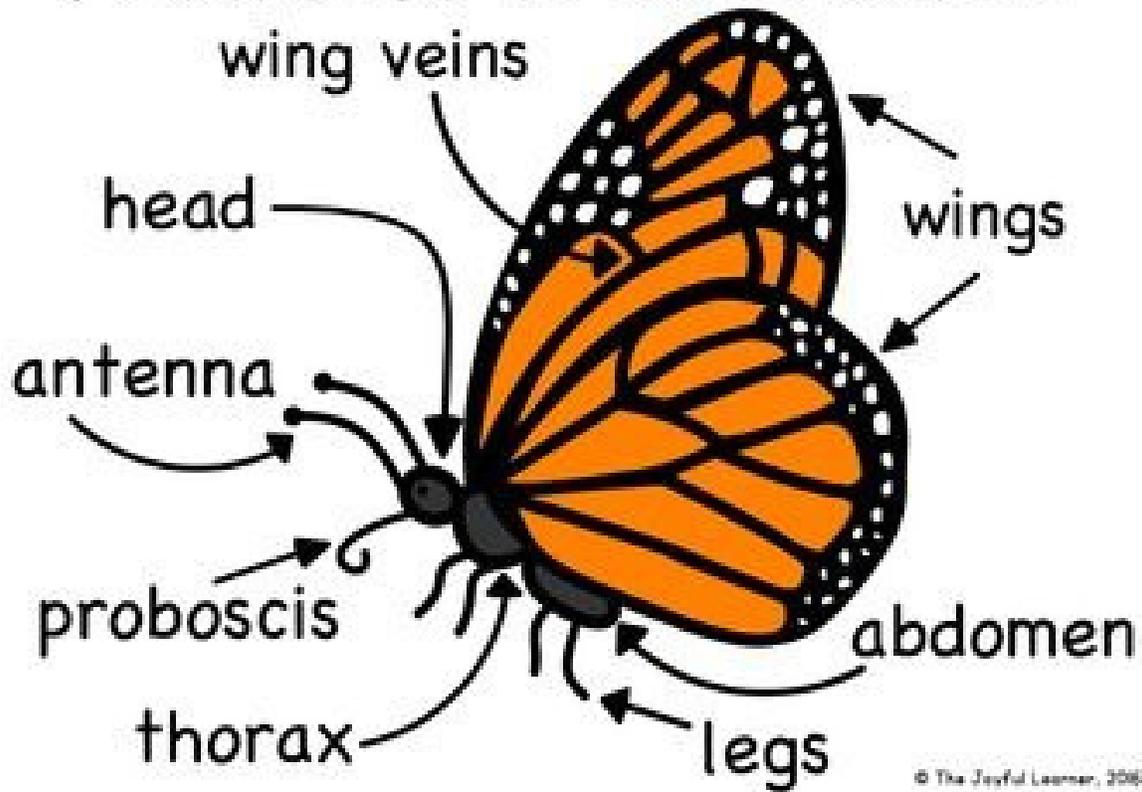
To hold a butterfly, always hold all 4 wings at once in their vertical position. Despite what you may have heard, it is alright to handle Monarchs, even touching their wings, if you do it carefully. Because they live a long time, and many of them withstand a rigorous migratory flight, they are relatively sturdy. A few scales may come off during handling, but this will not hurt the butterfly. Many other butterflies and moths are much more fragile.



You may either set your Monarchs free soon after they emerge, after waiting for the wings to dry. Monarchs that emerge in the morning can be released at the end of the day, or kept until the following day without needing to be fed. Those emerging in the afternoon should be released the next day. It is best if they are released on a warm sunny day, near flowers if possible. If it is colder than 60o F, they often cannot fly.



PARTS OF A BUTTERFLY



Holding a butterfly

Planting a Butterfly Garden

Your butterfly garden can be any size, from a window box to a portion of your landscaped yard to a wild, untended area on your lot. You can include native plants, cultivated species, or both.

There are flowers that predominantly attract hummingbirds, swallowtail butterflies and some large moths, while others attract numerous bee species and yet others attract butterflies, moths and even flies and beetles. If your garden contains a good mix of such plants, it can be a lively and very interesting place indeed (and don't worry about the bees they will be too busy collecting nectar and pollen to sting).

Top 10 Flowers for Attracting Butterflies



Aster



Daylily



Goldenrod



Hollyhock



Lavender



Lilac



Lupine



Milkweed



Pansy



Snapdragon



Monarch Waystation

These Specialized Pollinator Gardens Provide Habitat (Food, Shelter, and Water) for Monarch Butterflies on their Long Migrations



Food:
Native Milkweeds for
Monarch Caterpillars

Shelter:
Woody Trees and Shrubs
Protect Monarchs at Night
and During Bad Weather



Food:
Nectar Plants for
Monarch Adults and
Other Pollinators

Water:
Mud Puddles Provide
Moisture and Minerals

Create your own Monarch Waystation!



Plants in the Garden

- A - Swamp Milkweed *Asclepias incarnata*
- B - Butterfly Weed *Asclepias tuberosa*
- C - Wild Blue Indigo *Baptisia australis*
- D - Pale Purple Coneflower *Echinacea pallida*
- E - Joe Pye Weed *Eupatorium purpureum*
- F - Prairie Blazing Star *Liatriis pycnostachya*

- G - Wild Bergamot *Monarda fistulosa*
- H - Showy Black-eyed Susan *Rudebeckia fulgida var. speciosa*
- I - Prairie Dropseed *Sporobolus heterolepis*
- J - Little Bluestem *Schizachyrium scoparium*
- K - Mountain Mint *Pycnanthemum virginianum*
- L - Rattlesnake Master *Eryngium yuccifolium*

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ingers
LANDSCAPE SERVICES, INC.



Monarch Migration

THE MONARCH BUTTERFLY ANNUAL MIGRATION

Unlike most other insects in temperate climates, Monarch butterflies cannot survive a long cold winter. Instead, they spend the winter in roosting spots. Monarchs west of the Rocky Mountains travel to small groves of trees along the California coast. Those east of the Rocky Mountains fly farther south to the forests high in the mountains of Mexico. The monarch's migration is driven by seasonal changes. Daylength and temperature changes influence the movement of the Monarch.

In all the world, no butterflies migrate like the Monarchs of North America. They travel much farther than all other tropical butterflies, up to three thousand miles. They are the only butterflies to make such a long, two way migration every year. Amazingly, they fly in masses to the same winter roosts, often to the exact same trees. Their migration is more the type we expect from birds or whales. However, unlike birds and whales, individuals only make the round-trip once. It is their children's grandchildren that return south the following fall.

When the late summer and early fall Monarchs emerge from their pupae, or chrysalides, they are biologically and behaviorally different from those emerging in the summer. The shorter days and cooler air of late summer trigger changes. In Minnesota this occurs around the end of August. Even though these butterflies look like summer adults, they won't mate or lay eggs until the following spring. Instead, their small bodies prepare for a strenuous flight. Otherwise solitary animals, they often cluster at night while moving ever southward. If they linger too long, they won't be able to make the journey; because they are cold-blooded, they are unable to fly in cold weather.

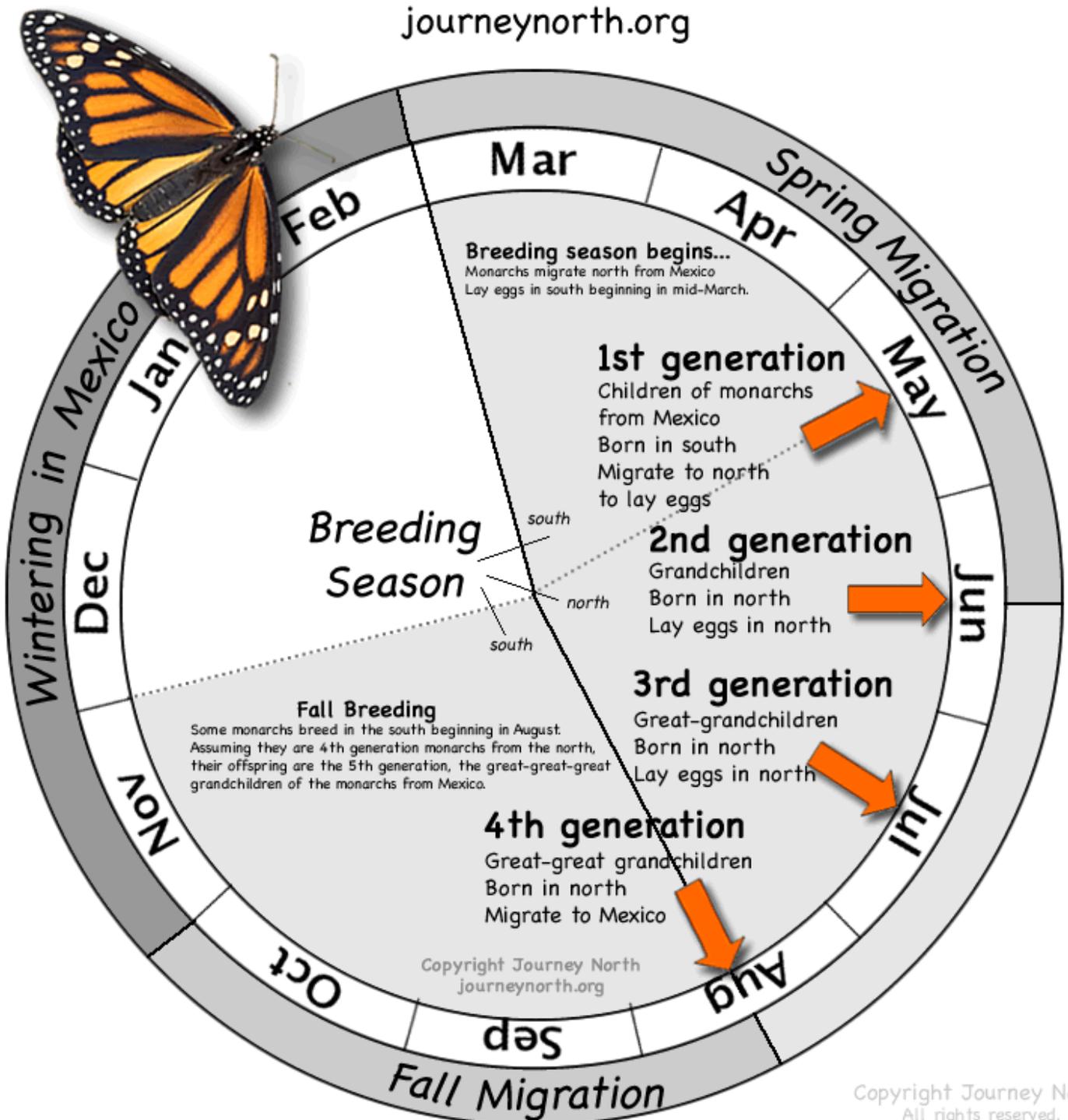
Fat, stored in the abdomen, is a critical element of their survival for the winter. This fat not only fuels their flight of one to three thousand miles, but must last until the next spring when they begin the flight back north. As they migrate southwards, Monarchs stop to nectar, and they actually gain weight during the trip! Some researchers think that Monarchs conserve their "fuel" in flight by gliding on air currents as they travel south. This is an area of great interest for researchers; there are many unanswered questions about how these small organisms are able to travel so far.

Another unsolved mystery is how Monarchs find the overwintering sites each year. Somehow they know their way, even though the butterflies returning to Mexico or California each fall are the great-great-grandchildren of the butterflies that left the previous spring. No one knows exactly how their homing system works; it is another of the many unanswered questions in the butterfly world.



Report Your Sightings!

journeynorth.org





Tagging Monarchs

THE MONARCH BUTTERFLY ANNUAL MIGRATION

The Monarch Watch Tagging Program is a large-scale citizen science project that was initiated in 1992 to help understand the dynamics of the monarch's spectacular fall migration through mark and recapture. Tagging was originally used by Dr. Fred Urquhart of the University of Toronto help locate overwintering monarchs and later to determine where monarchs came from that wintered in Mexico.

Our long-range tagging program at Monarch Watch continues to reveal much more. Tagging helps answer questions about the origins of monarchs that reach Mexico, the timing and pace of the migration, mortality during the migration, and changes in geographic distribution. It also shows that the probability of reaching Mexico is related to geographic location, size of the butterfly, and the date (particularly as this relates to the migration window for a given location).

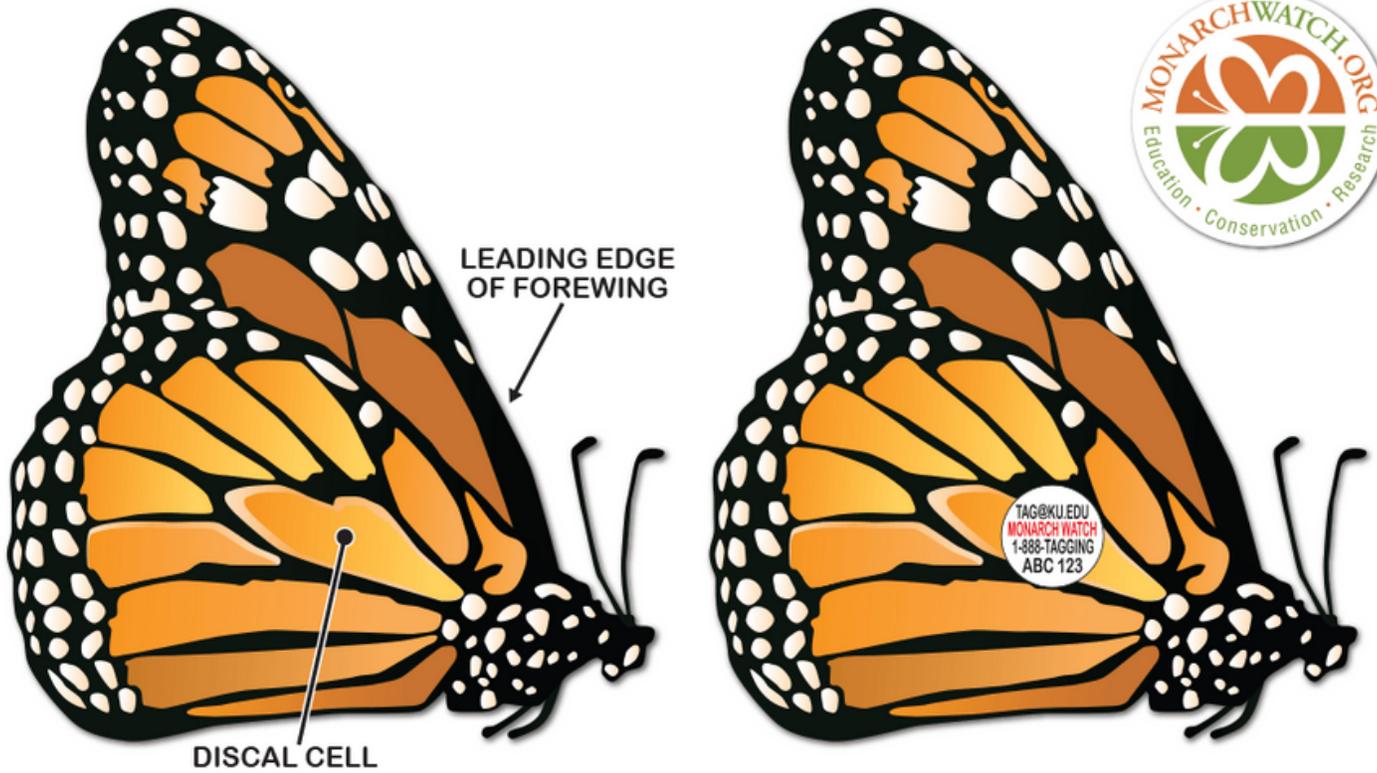
How to Apply a Tag to a Monarch

Carefully hold a monarch between your thumb and index finger along the leading edge of the butterfly's forewings (close to the body, not at the tip) and locate the discal cell (large mitten-shaped cell on the hindwings). The tag is placed over the large, mitten shaped cell (discal cell) on the underside of the hindwing of the monarch. This tagging method places the tag close to the center of lift and gravity for the butterfly so as to not interfere with flight or otherwise harm the butterfly.

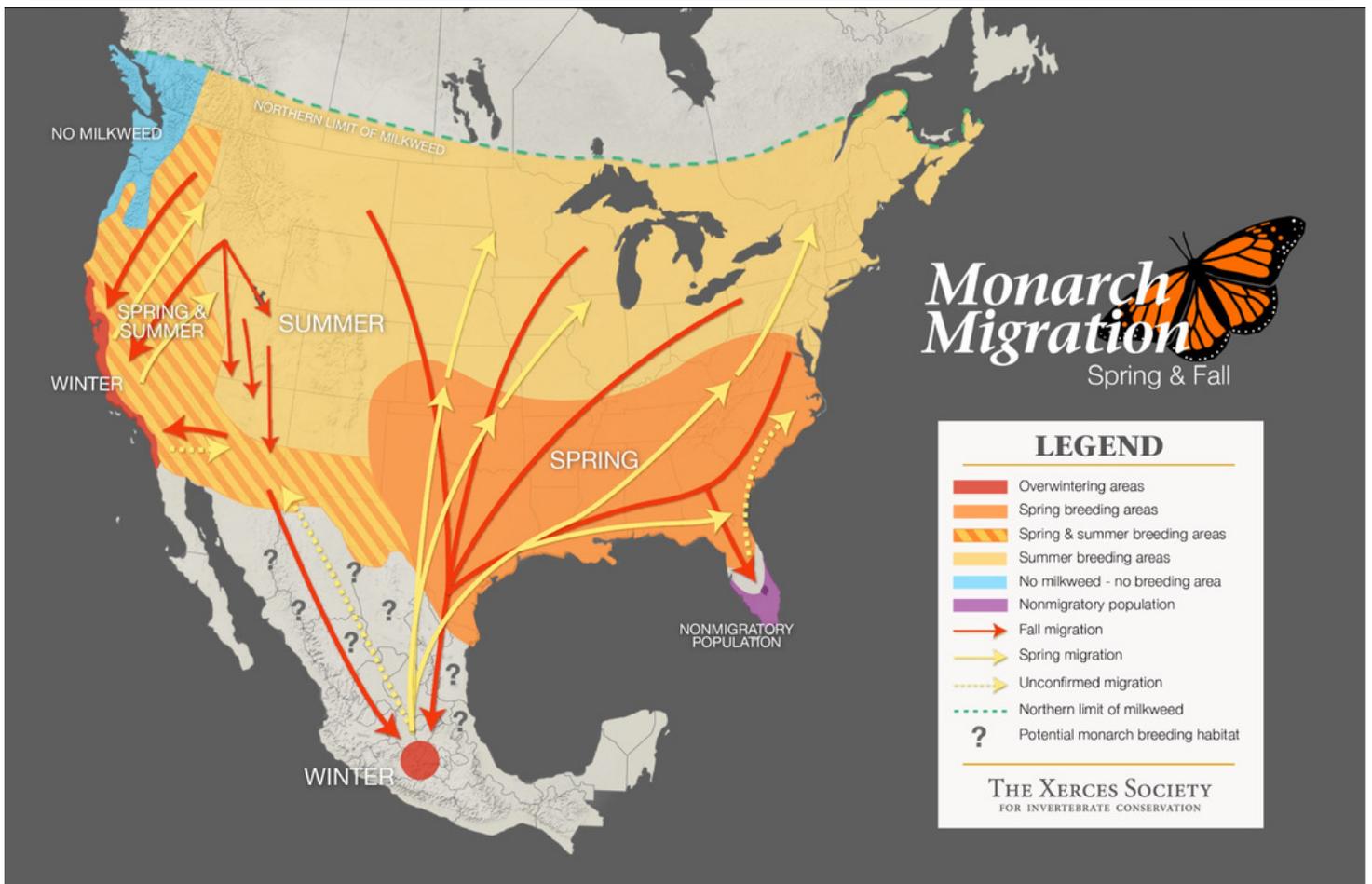
Tagging monarchs is as easy as:

- (1) record the complete alphanumeric tag code (e.g. AABC123) and other information requested on the datasheet;
- (2) remove the tag from the backing, place it over the discal cell and position the pads of your thumb and forefinger over the discal cells on both sides of the butterfly press firmly for two seconds; and
- (3) release the butterfly.





PROPER PLACEMENT OF MONARCH WATCH TAGS
monarchwatch.org/tagging





Raising Monarchs

BEST PRACTICES, TIPS & ADVICE

As with all instances of caring for all living things, there are many important factors to keep in mind when raising and releasing monarchs. We have compiled a short list of tips to help make your experience positive for both you and the insects in your care.

- Only raise monarchs when you will be available for care for it throughout the growth cycle (approx. 20-30 days) and ensure you have the best possible conditions available to mimic a natural habitat.
- Locate an accessible and reliable milkweed source before committing to rearing monarchs.
- When collecting eggs and/or milkweed from the wild, try to leave wild caterpillars where you find them as they can bring diseases or bacteria into your indoor habitats. Take additional precaution against disease by rinsing eggs and milkweed with a 10% bleach solution and rinsing thoroughly. Also rinse habitats with a bleach solution between generations and at the end of the season.
- Keep the habitat clean! Caterpillars are very sensitive and need to have their frass (excrement) cleaned out daily, particularly as they get bigger. Frass can be wiped or vacuumed out, depending on the type of habitat container you are using.
- Avoid extreme temperature and moisture conditions and try to mimic natural environmental conditions as closely as possible.
- Remember that the purpose of hand-raising Monarchs is for education and awareness and should never be intended as a sport or competition. Keeping too many caterpillars together and caterpillars from various sources and of different sizes can be harmful and can quickly spread disease. In order to keep this a fun and educational activity, keep your caterpillar numbers low and focus on the science and sustainability of the practice.
- Join an online support group for Monarch conservationists to learn more tips and tricks!



Resources

WHERE TO GO FOR MORE INFO & ADVICE





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