

## Monitoring Monarchs: The Magic of Migration

How can one, with paper wings, withstand the challenges of a 3,000-mile journey? At this time of year, it's not just the birds preparing to migrate south! The monarch butterflies here in NH are about to flutter their way down to the forests of northern Mexico. Let's imagine we are monarch butterflies as we discover some of the challenges a 3,000-mile adventure presents when you weigh less than a tic-tac, can't get wet, and use the sun as your GPS to get you safely across the continent.

<b>Lesson Duration:</b> 45-60 minutes	
<b>Objectives:</b> Students will develop a basic understanding of the life cycle of a monarch butterfly while discovering the challenges posed in each developmental phase concluding with migration.	
<b>Introduction:</b> Welcome	3 minutes
<b>Present:</b> Monarchs 101	5 minutes
<b>Action:</b> Metamorphosis Yoga	5 minutes
<b>Action:</b> Instar Dice	3 minutes
<b>Discuss:</b> Metamorphosis & Migration	
<b>Activity:</b> Migration Game	
<b>Present:</b> How to Help/Get Involved	
<b>Activity:</b> Monarch Craft	
<b>Closing:</b> MOTUS	

**Assessment:** Upon completing this lesson students will be able to:

**MATERIALS:**

- ☐ Poker chips
- ☐ Squirt bottles
- ☐ State Labels
- ☐ Felt Fir trees
- ☐ Monarch Dice
- ☐ Praying mantis puppet
- ☐ Migration map
- ☐ Dice (enough for at least ½ the class)
- ☐ Felt circles

**Monarchs 101:** What do we know? What do we want to know?

Monarchs are insects. Cover head, thorax, abdomen. Show caterpillar: head, thorax, abdomen, thoracic legs, prolegs. Bring out props to instruct wings, exoskeleton, antennae, compound eyes. Instruct the students through a metamorphosis- egg, caterpillar, chrysalis (J-shape), butterfly.

Begin as an egg by the Monarch Garden. Explain how once they hatch, they will go through a phase of eat, rest, shed, repeat. Monarch caterpillars' first meal is their own egg! Because monarchs are insects, their skeleton is on the outside of their body, not inside like ours. When they grow too big for their skeletons, they simply wiggle out of them. Beneath the old skeleton is their new skeleton. A caterpillar's skeleton is not hard or strong like ours but it serves a similar purpose. A monarch caterpillar cannot make a chrysalis until it has shed 5 times! Each stage between sheds is called an instar.

Monarch caterpillars only eat one type of food. Point out milkweed. Inform students that milkweed is toxic to many animals and that monarchs become toxic to most predators because they eat the milkweed. Let's roll the dice and see if we can survive through our five sheds, also known as instar phases, in order to make it into a chrysalis.

### **Caterpillar -> Chrysalis**

**Roll the dice and take a path towards the chrysalis. Read what's on your circle and follow the instructions before rolling again.**

Chrysalis: You ate your fill of milkweed leaves, avoided predators, and made it through your 5- instar phases! Congratulations.

### **Discuss: Metamorphosis & Migration**

The monarch butterflies we are seeing are the ones preparing to fly to Mexico. Once there, they will flood the Oyamel forest's fir trees and lay quiet for the winter months. When the days begin to lengthen, the monarchs will mate and fly north, returning to the US via Texas where they will lay their eggs and later die. The children of these butterflies will then grow and develop into butterflies themselves before repeating the cycle and flying northbound to breed and lay their eggs. The monarch butterflies we are seeing here in NH are the great grandchildren of the monarchs that overwintered last year in Mexico! Summer generations of monarch butterflies live on average for approximately 2-5 weeks. The overwintering generation can live for up to nine months, which is necessary since their migration from the north can take up to one full month.

Show Map.

### **Activity: Obstacle Course**

Can you make it to Mexico? Each flower bed represents a state you are passing through on your way to Mexico (NH, PA, NC, GA, AL, TX). In order to progress through each one, you must complete the instructions on the state signs.

**NH to PA:** This Pollinator Garden has been specially designed to fuel you up for your autumn voyage. Collect 5 nectar tokens before heading south to Pennsylvania.

**PA to NC:** You're following the Atlantic Coast as you head towards North Carolina. Roll the Dice to see what you could face on the way! Use the key to figure out what each symbol represents.

**NC to GA:** What a journey! You need more food. Fuel up in North Carolina by finding 3 more nectar tokens. Beware, some predators like mantids and spiders hide in flower petals!

**GA to the Gulf Coast:** Find 5 nectar tokens then speed onward to the Gulf.

**Alabama to Texas:** Hurricane season coincides with monarch migration. Try to avoid the rain as you fly along the coast towards your final nectar site before departing the USA.

**Texas to Mexico:** To your overwintering site in Mexico, you must first traverse the highs and lows of a changing terrain. Take one final lap around the Pollinator Garden before flying into the Oyamel Forest.

**Mexico:** Oyamel Forest Meditation.