



### Survival Bingo

*You can use monarchs to teach about many things! Stone Mountain Memorial Association (SMMA) uses the monarch butterfly to help students apply their knowledge in other contexts and to different disciplines. The activities relate a grade-level specific GPS to monarch life, habitat or migration. Use this lesson as a post-trip activity following your 4th Grade Exploring Wetlands field trip.*

*GPS correlation: S4L2. Students will identify factors that affect the survival or extinction of organisms such as adaptation, variation of behaviors (hibernation) and external features (camouflage and protection).*

#### **Preparation:**

Read the background information. Print the worksheets and make an over-head or display on your Interactive white board. Make copies for each student or pair of students. Approximately 13 markers per worksheet will be needed for the Survival Board (BINGO card) activity. Markers can be coins, math counters or simply small pieces of paper.

#### **Background Information:**

Monarchs spend spring and summer in Canada and the United States, but spend the winter in Mexico. Monarchs encounter predators in both areas. In this lesson we will explore how monarchs survive in both the United States and Mexico using variations of behavior (clusters in a group, crawls upward), adaptation (accumulating toxins in their body), and external features (bold coloring).

Female monarchs lay their eggs only on milkweed leaves because it is the only food source for their caterpillars. The plant's leaves and stem contain a toxin, called cardiac glycoside, that monarchs and other invertebrates can tolerate. As the caterpillar eats the plant, the toxin is stored in its exoskeleton and is retained throughout its development into an adult. In fact, this toxin, which tastes bitter and causes sickness, is one of the monarch's defenses against vertebrate predators, such as birds and mammals. Some birds (United States – Brown Thrashers, Grackles, Robins and Cardinals; Mexico – Black-backed Oriole and Black-headed Grosbeak), and mammals such as the Black-eared Mouse in Mexico, avoid the toxin by not eating the abdomen, exoskeleton or the wings. Adult monarch butterflies have a 4-inch wingspan and bright orange coloring with bold black lines that warns predators of their nasty taste.

When monarchs are startled, they drop from the trees to the ground. If it is sunny and/or above 50°F, they can just fly away. If it is cloudy or still a bit too cold, monarchs can crawl to any tree or bush and begin to crawl upward. If it is too cold, the monarchs cannot move at all from the ground. Here they may be eaten by predators – in the United States by insects and in Mexico by the Black-eared Mouse.

In Mexico, there are huge forests of oyamel fir trees for the monarchs to cluster in, or roost. The forest protects them from wind and snow. Clustering in large groups also protects those on the inside of the cluster from predators.



### **Activity:**

Review vocabulary – adaptation, variation of behaviors and external features. (You might put the vocabulary up on the board so students can refer back to it.) Read them the essential question so they understand the focus of the lesson. Hand out worksheets and markers.

### **What will the monarch do to survive? Situations in Georgia and Mexico**

These do not need to be read in order. They are simply numbered for convenience.

1. In the United States, a monarch butterfly got wet in a sudden rain shower. It can't fly with wet wings so it fell to the ground in a meadow of flowers. How will the monarch avoid ants scavenging on the meadow floor?

*Answer: Crawls up*

2. In Mexico, flocks of hungry Black-headed Grosbeaks and Black-backed Orioles come flying through the forest. These birds love to eat the monarchs resting in the trees. They pick off those resting alone or those on the edge of the group. How does the monarch avoid these predators?

*Answer: Cluster*

3. In the United States, a young bird eats a monarch caterpillar. Soon, he becomes extremely sick. Why?

*Answer: Toxins in body*

4. In the United States, a Blue Jay flies toward a resting monarch. The butterfly suddenly opens its wings to flash its 4-inch wing span of black and bright orange colors at the bird. The Blue Jay flies away. Why?

*Answer: Bold coloring*

5. In Mexico, the weight of thousands of butterflies roosting in the trees causes a branch to break and fall to the forest floor. It is too cold for the butterflies to fly. The branch falls among small trees and low shrubs. How will the monarchs avoid being eaten by the Black-eared Mouse?

*Answer: Crawls up*

6. In Mexico, the temperature drops to 42° F one night. How will the monarch avoid freezing?

*Answer: Clusters*

7. In the United States, many adult birds will not eat the monarch because of its nasty taste. What causes the nasty taste?

*Answer: Toxins in body*

8. In Mexico, a strong wind blows for days. How does the monarch avoid the winds?

*Answer: Clusters*



**Essential Question:**

The monarch butterfly uses various tactics to survive in the habitat of both Georgia and Mexico. Listen carefully to each situation. Which one of these tactics will the monarch butterfly use to survive the situation? There will be one correct answer for each situation.

Use a marker or coin to hold a place on the SURVIVAL BOARD for each correct answer. You may only use one marker for each situation read. The monarch butterfly symbol is a free space. Try to fill every space in one row or in one column to win!

**SURVIVAL BOARD**

 <b>CLUSTERS</b>	 <b>CRAWLS UP</b>	 <b>FREE SPACE</b>	 <b>TOXINS IN BODY</b>	 <b>BOLD COLOR</b>
 <b>BOLD COLOR</b>	 <b>FREE SPACE</b>	 <b>CRAWLS UP</b>	 <b>TOXINS IN BODY</b>	 <b>CLUSTERS</b>
 <b>CRAWLS UP</b>	 <b>CLUSTERS</b>	 <b>TOXINS IN BODY</b>	 <b>FREE SPACE</b>	 <b>CRAWLS UP</b>
 <b>FREE SPACE</b>	 <b>BOLD COLOR</b>	 <b>CLUSTERS</b>	 <b>CLUSTERS</b>	 <b>CRAWLS UP</b>
 <b>TOXINS IN BODY</b>	 <b>CRAWLS UP</b>	 <b>BOLD COLOR</b>	 <b>BOLD COLOR</b>	 <b>FREE SPACE</b>