# Monarchs in Danger


**FRAME 7**

**Cold winter temperatures have hurt the monarch butterfly population.**

**BASIC LEVEL**

Here on the left you see a butterfly. **From the words, what's the name of this butterfly?** *(Monarch.)* The monarch is a pretty tough butterfly. But over three of the past five winters, a very sad thing has happened to them. Hundreds of millions were killed at their winter home in Mexico when it got too cold. Scientists who study monarchs say the monarchs are in danger because so many of them were killed. **Do you like butterflies?**

A butterfly isn't born a butterfly. It is born a tiny egg, and it grows into a caterpillar, which you see here on the bottom right. The monarch caterpillar eats a lot — growing about 2,500 times its original size in only two weeks! After it's fully grown, the caterpillar wraps itself in a pupa, like the one you see here on the top right. **What comes out of the pupa?** *(A butterfly.)* NEXT PICTURE

**GENERAL LEVEL**

Over the past few years, hundreds of millions of butterflies like the one you see here on the left were killed. A mixture of bad winter weather over three of the past five winters — rain mixed with cold temperatures — has caused major die-offs in these butterflies. **From the words you see here, what are these butterflies called?** *(Monarchs.)* Scientists estimate that hundreds of millions of monarchs died over the last two years due to record-breaking cold temperatures in Mexico, where the insects spend the winter. **Have you seen butterflies like this one before? What do you know about butterflies?**

Like all butterflies, monarchs go through a huge change in their lives called "metamorphosis." The first stage of metamorphosis is the egg. Within a few days after being laid, a monarch larva, or caterpillar, emerges from its egg. The picture here on the bottom right shows a monarch in the larva stage. A monarch caterpillar is an eating machine, munching mostly on its favorite meal, the milkweed plant. A monarch caterpillar multiplies its weight by more than 2,500 times in less than two weeks! After the caterpillar has reached the appropriate size, it begins to transform into the next stage of metamorphosis — the pupa. On the top right you see a monarch in the pupa stage. Some people refer to this as the chrysalis. **What happens during the pupa stage?** *(The larva turns into a butterfly.)* The butterfly is the adult stage of metamorphosis, which is the last stage of life. Let's take a look at the adult life of a monarch. NEXT PICTURE

**ADVANCED LEVEL**

The picture on the left shows a monarch butterfly. Over the past two winters, record-breaking cold and rains have taken a serious toll on the monarch population. Experts estimate that hundreds of millions of monarchs died during that period, which saw Mexico's coldest temperatures in a decade. Some say the monarch population in North America is down by as much as 75 percent, threatening the survival of the species. **Do you see monarchs in your area during the year? What do you know about the species?**

Like all butterflies, monarchs go through a huge change in their lives called "metamorphosis." **Can anyone explain the four stages of metamorphosis, referring to the pictures you see here that represent the final three stages?** *(The first stage of metamorphosis is the egg. Within a few days after being laid, a monarch larva, or caterpillar, emerges from its egg. The picture here on the bottom right shows a monarch in the larva stage. The larva eats a lot, and after it has reached the appropriate size it begins to transform into the next stage of metamorphosis — the pupa. On the top right you see a monarch in the pupa stage. Some people refer to this as the chrysalis. In the pupa, the larva breaks down and turns into a butterfly, which you see on the left.)* Let's take a look at the adult life of a monarch. NEXT PICTURE

# Monarchs in Danger (continued)

**FRAME 8**

**Monarchs migrate between their homes in Canada and the U.S., and Mexico.**

**BASIC LEVEL**

Monarch butterflies live an interesting adult life. Each fall, the adult monarchs that live all over the U.S. and Canada fly thousands of miles to some mountains in central Mexico to spend the winter. **Why do you think they do this?** *(To get away from the cold.)* This is called a "migration." **What other animals migrate?** *(Many birds, fish, whales, and so on.)* The monarchs spend the winter in an area of Mexico where the temperature rarely drops below freezing, or 32 degrees Fahrenheit. They curl up together on trees to stay warm. In the spring, the monarchs start their journey back to the U.S. and Canada, following routes like the ones you see here on the map. A smaller group of monarchs spend the winters on the California coast. Along the way back, the female monarchs lay eggs, and new monarchs develop. These summer monarchs live only five or six weeks, and some never make it to their destination — but their children do. NEXT PICTURE

**GENERAL LEVEL**

Monarch butterflies have fascinated people for years with their mysterious migration habits. **What is migration?** *(When a creature moves to a different region according to a season.)* The monarchs spend the winter in a part of Mexico where the temperature rarely drops below freezing, and they curl up together in trees to stay warm. In mid-March the monarchs will start their journey back to the U.S. and Canada. The map here shows how the monarchs travel together until they reach Texas, then branch out to different parts of the U.S. and southern Canada. A smaller monarch butterfly population living west of the Rocky Mountains spends the winter along the California coast, and goes to the Pacific Northwest for the spring and summer.

Throughout their journey north, female monarchs lay up to 400 eggs. The resulting summer monarchs live only five or six weeks, and rarely make it to their destinations, but their offspring continue the migration. This is one of the most puzzling things about the monarch butterfly to scientists — that the yearly migration is performed over several generations of monarchs. **How do you think the monarchs know where to fly?**

Each fall, the monarchs head back to Mexico, nesting in the same trees as monarchs did the year before. They arrive during the first days of November, around the Mexican holiday the Day of the Dead. A Mexican myth about the monarchs says they are the spirits of people's dead ancestors. NEXT PICTURE

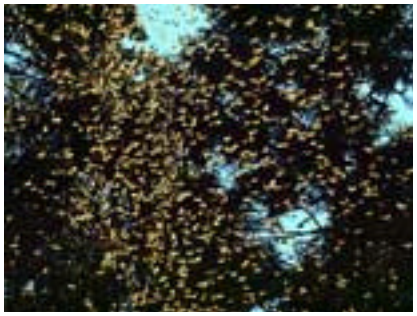
**ADVANCED LEVEL**

Monarch butterflies have a curious habit that has puzzled scientists for years. **Does anyone know what that might be?** *(They migrate across huge distances.)* Each fall, millions of monarchs from all over the eastern and Midwestern U.S. and southern Canada fly to the Transvolcanic Mountains in central Mexico. The monarchs nest in the same trees where monarchs nested the year before. They arrive during the first days of November, around the Mexican holiday the Day of the Dead. A Mexican myth about the monarchs says they are the spirits of people's dead ancestors.

In mid-March the monarchs will start their journey back to the U.S. and Canada. The map here shows how the monarchs travel together until they reach Texas, then branch out to different parts of the U.S. and southern Canada. A smaller monarch butterfly population living west of the Rocky Mountains winters along the California coast, and spends spring and summer in the Pacific Northwest.

The butterflies fly northward, stopping to lay eggs in the southern U.S. The monarchs that develop from those eggs continue the journey, and by summer, butterflies reach as far north as Canada. This means the monarchs that reach their destination are at least one generation removed from the ones who left Mexico. Scientists aren't sure how monarchs know where to migrate, but some think that monarchs have magnetic minerals embedded in their bodies which give them their own inner compasses. **How do <u>you</u> think the monarchs know where to fly?** NEXT PICTURE

# Monarchs in Danger (continued)



**FRAME 9**

**Scientists worry that monarchs cannot overcome the environmental obstacles humans create for them.**

## BASIC LEVEL

**What does this picture look like to you?** It may look like hundreds of yellow tree leaves, but these are actually monarch butterflies. **What do you think it would be like to see all these monarchs flying together?**

Monarchs are not an endangered species, but many scientists are worried about their future. In the winter, monarchs live in forest trees where thick treetops keep rain and snow out and warmth in. But in the last 30 years, more than 40 percent of the monarch's forest in Mexico has been cut down. **Why is this bad?** *(Fewer trees, less protection for the monarchs.)*

The monarchs also face a problem in the U.S. and Canada where their main food source, the milkweed plant, is often killed as a useless weed. **What do you think people could do to make sure monarchs are around in the future?** END OF STORY

## GENERAL LEVEL

At first glance, this picture looks like hundreds of yellow leaves, but actually this is a large group of monarch butterflies in Mexico. People who have seen this in person say it is an amazing sight. **What do you think it would feel like to see this in real life?**

Monarchs are not an endangered species, but many environmentalists are concerned about the monarch's future. In Mexico, the monarchs spend their winters in fir forests. The thick treetops protect the monarchs from some of the wind, rain, and snow that falls. The tree tops also act as a big blanket in keeping the butterflies warm. But logging in the monarchs' forests threatens to thin out their shelters. Much of the land that monarchs rest in is currently protected, but over the last 30 years, more than 40 percent of the surrounding forests have been thinned out, which means less insulation for the monarchs. Scientists agree that the recent monarch die-offs were likely to happen because of the extreme weather, but with less forest cover these die-offs can be more severe.

Another threat to the monarch's survival is the use of pesticides, or weed killers, on milkweed plants — the monarch's favorite food. Milkweed is considered a nuisance by some people, so many are destroyed as weeds. The shrinking milkweed population could shrink the monarch population as well. **What do you think people could do to make sure monarchs are around in the future? Can you think of some reasons it would be beneficial to people to protect the monarchs' habitat?** END OF STORY

## ADVANCED LEVEL

The picture you see here is not a cluster of leaves. It's actually a group of hundreds of monarch butterflies flying around in Mexico. Monarchs are not an endangered species, but many environmentalists are concerned about the monarch's future. In Mexico, the monarchs spend their winters in thick fir forests. The forest canopy protects the monarchs from the elements while at the same time acting as a big blanket and keeping the butterflies warm. But logging in the monarchs' forests threatens to thin out their homes. Much of the land that monarchs rest in is currently protected, but over the last 30 years, more than 40 percent of the surrounding forests have been thinned out. **Why might thinning forests threaten the monarchs?** *(Less insulation from the trees means more die-offs from the cold weather.)* Scientists agree that the monarch die-off in January was inevitable because of the extreme weather, but with less forest cover these die-offs can be more severe.

Another threat to the monarch's livelihood is the use of pesticides on milkweed plants — the monarch's favorite food, which is also essential for larva development. Milkweeds are considered a nuisance to some people, so many are destroyed in the U.S. and Canada. The shrinking milkweed population could in effect shrink the monarch population. **What do you think people could do to make sure monarchs are around in the future? Why is it important to do so?** END OF STORY