EDUCATIONAL GUIDE

THE MONARCH BUTTERFLY



FILM POSTER

For the **October 13th, 2023 theatrical release** of their animated movie for the entire family, "Butterfly Tale", CarpeDiem Film & TV and Vortex are proud to offer teachers this educational guide to monarch butterflies, designed and written by biologist and science journalist for children Marie-Claude Ouellet.

VORTEX MEDIA

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BUTTERFLY
TALE

Dear Teachers,

The aim of this guide is to help you have your students discover the life and secrets of the monarch butterfly, as well as the importance of protecting this insect which contributes to the balance of nature. The guide consists of two main sections and activities in the classroom and outdoors:

- The first section summarizes for you the information contained in this presentation concerning the characteristics and peculiarities of this insect, including its anatomy, manner of living, and the many dangers that threaten it.
- The second section takes up in detail this information for your students, along with educational and fun activities to be carried out in or out of the classroom.
- The in-class activities come in a variety of forms, such math puzzles and crosswords, coloring as well as discussions on disabilities and self-improvement.
- The field activities are sure to inspire your students to help save the monarch butterfly. Thanks to them, kids will have a chance to get their hands dirty. Among other things, the guide explains how to create a flower garden for butterflies!
- Finally, you can take your class to the cinema to discover "Butterfly Tale", the story of two courageous butterflies, Patrick and Jennifer, who, along with their friend Martin, the funniest caterpillar around, make the great annual migration of their species and become heroes after overcoming their fears, accepting their differences; and triumphing over natural predators and environmental perils.

Happy discoveries!

Marie-Claude Ouellet
Biologist, researcher and scientific journalist



THEORETICAL CONCEPTS FOR TEACHERS

GUIDE'S TARGET AUDIENCE:

Pupils between the ages of 6 and 12.

SUBJECTS COVERED:

Science and nature, social universe, ethics, French, and mathematics.

DEVELOPED CROSS-DISCIPLINARY SKILLS:

Making use of information, exercising critical judgement, structuring your identity, applying creative thinking, cooperate, communicating appropriately and solving problems.

1 THE MONARCH, A UNIQUE BUTTERFLY!

With its brightly colored black and orange wings, the monarch is a true delight. It's one of Canada's largest butterflies. Even its caterpillar is of exquisite beauty! The monarch's behavior and fabulous abilities are also amazing.

This frail-looking creature travels thousands of kilometers each and every year on its great migrations! Its body contains a toxic substance that protects it from its natural enemies, such as birds. The monarch caterpillar accumulates this toxin by feeding on milkweed leaves, its sole source of nourishment. This toxicity is then transferred to the butterfly's body during metamorphosis.

2 REPRODUCTION AND ROLE OF THE MONARCH

The female lays her eggs on milkweed plants. The caterpillar which emerges from the egg has yellow, black and white stripes, as well as six legs and prolegs. After a certain time, as with all butterflies, the caterpillar molts into a chrysalis, then metamorphoses into a butterfly.

The monarch is a daytime butterfly. It has filiform antennae and a proboscis used to draw nectar from flowers, notably those of the milkweed. Like bees, this butterfly is an excellent pollinator, contributing to fruit production.

3 A PRODIGIOUS MIGRATION

Each and every year, the monarch butterfly accomplishes one of the longest migrations in the animal kingdom. For such a small insect, this is quite a feat!

In Canada, there are two migratory monarch populations, separated by the Rocky Mountains. The western population spends the summer in British Columbia and Alberta, and the winter in California. The migration of the eastern population is even more spectacular, as these butterflies travel over 5,000 kilometers from Quebec to spend the winter in Mexico!

However, this migration is threatened by climate change, as a result of human crops, as well as the use of chemical pesticides and even the destruction of milkweed fields to make room for crops and housing.

4 A SPECIES IN SHARP DECLINE

Today, the monarch faces multiple dangers, such as predators, storms, milkweed scarcity, deforestation and climate change. Alas, monarch populations have sharply declined.

The migratory monarch butterfly is listed as **"endangered" on the International Union for Conservation of Nature's Red List of Threatened Species.** According to the IUCN, the western North American population is the most threatened, which declined by 99.9% between 1980 and 2021. The eastern North American population likewise reduced by 84% between 1996 and 2014. Unfortunately, this downward trend continues even today.

5 HELP PRESERVE THE MONARCH

This guide proposes a number of different ways to help monarchs. The information and activities it contains are aimed first and foremost at raising student awareness of the importance of monarchs and the precariousness of their populations. It's accomplished through learning and play, without generating "eco-anxiety". This marks a crucial step in the conservation process. As Jacques-Yves Cousteau said, "We love what we marvel at, and we protect what we love."

1

THE MONARCH, A UNIQUE BUTTERFLY



1.1 A MAGNIFICENT... AND UNIQUE INSECT

MONARCH, WHO ARE YOU?

With its orange and black wings, the monarch doesn't go unnoticed. All the more so as it's one of Canada's largest butterflies. This insect is also a great traveler. Even if it appears fragile, it can fly from southern Canada to Mexico, a distance of over 5,000 kilometers! For such a small insect, that's quite a feat!

During its long journey, the monarch must confront multiple dangers, such as violent winds, **famine** or even **predators**, like mice, spiders and birds.

It's this fabulous voyage, full of challenges, that the courageous heroes of the movie, **"Butterfly Tale"** must make.



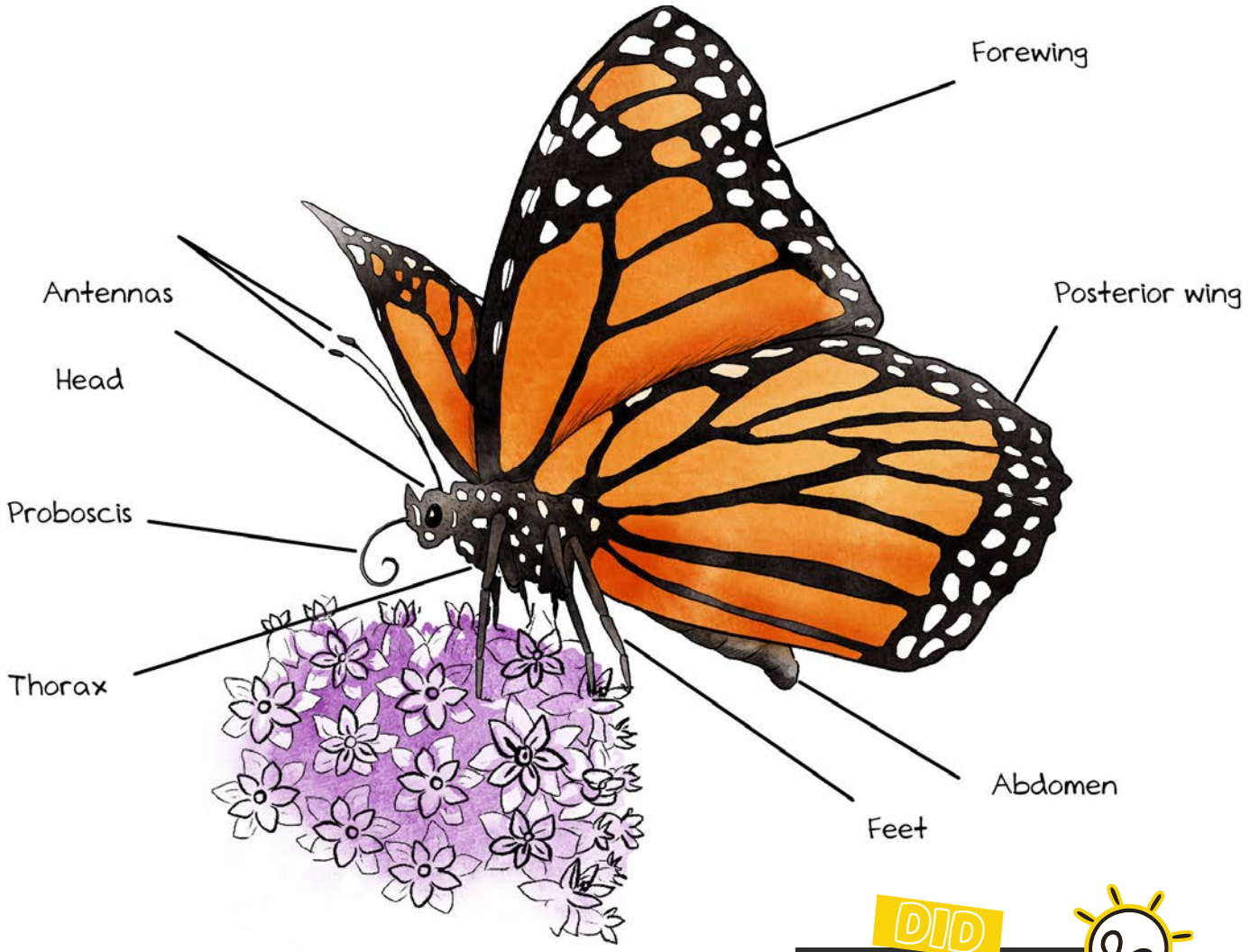
Discover now all the secrets of the life of the monarch.

1.2 PHYSICAL CHARACTERISTICS

The monarch butterfly belongs to the insect group. These **invertebrates** have the following characteristics:

- A body divided into three parts: head, thorax and abdomen
- Six legs
- Two antennae
- Often, one or two pairs of wings

Like all butterflies, the monarch has two **filiform** antennae. To feed on flower nectar, the monarch inserts its long **proboscis**.



DID YOU KNOW?

When a butterfly isn't eating, it curls up its long proboscis under its head.

1.3 THE MONARCH'S CHARACTERISTICS

With its orange and black wings, the monarch doesn't go unnoticed. All the more so as it's one of Canada's largest butterflies. This insect is also a great traveler. Although it may appear fragile, it can fly from southern Canada to Mexico, a distance of some 5,000 km! For such a small insect, that's quite a feat!

Size (wingspan): 9.3 to 10.5 cm (about the length of a pen)

Weight: 0.5 g (lighter than a postage stamp).

Diet: The caterpillar only eats milkweed leaves, while the butterfly feeds on the nectar of several different flower species, including milkweeds.

Geographical distribution: From Canada to Argentina. The monarch is also to be found on islands and in countries in hotter climes, such as New Caledonia, New Zealand, India, Sri Lanka, Bermuda, the Bahamas and the West Indies.

It seems that certain migratory monarchs even travel from North America to Europe... aboard boats! They can be found in France, Spain, Great Britain and Ireland, but these monarchs don't usually migrate. However the species does occasionally migrate to the Azores and Portugal.

Status: Endangered but steps can be taken to protect them.

DID YOU KNOW?

Butterfly wings are covered with tiny scales. These are arranged like tiles on a roof and give butterfly wings their beautiful olors and patterns.





2 REPRODUCTION AND ROLE OF THE MONARCH

2.1 MONARCH REPRODUCTION

The female monarch lays her eggs on a plant called milkweed. The caterpillar that emerges from the egg has yellow, black and white stripes, with long black filaments near its head and at the end of its abdomen.

Its antennae, on either side of its mouth, are barely visible. It has six legs as well as several false legs or "prolegs" equipped with suckers and hooks. These tiny hooks help them grip onto leaves and stems of plants.

The caterpillar feeds solely on milkweed leaves. By dint of eating, it grows enormously larger in size. After just 7 to 17 days, its weight increases by 2,700-fold! Next, the caterpillar leaves the milkweed plant and hangs itself from a support, weaving a mat of silk thread with its mouth which helps it cling on. Then it inserts into it the hooks found at the end of its abdomen.

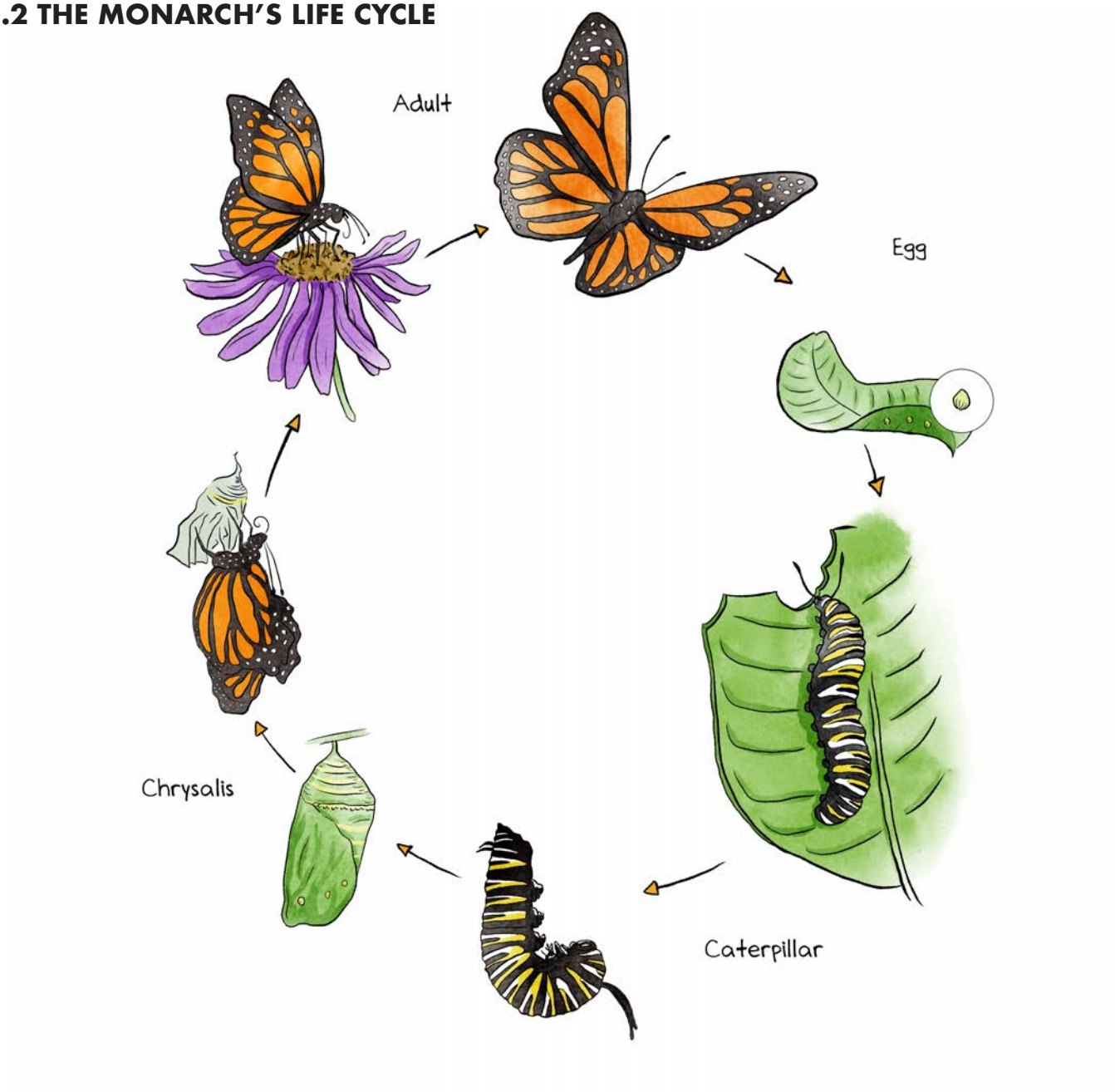
Unlike moth caterpillars, monarch caterpillars don't spin cocoons. Instead, they little by little transform themselves into a beautiful emerald-green chrysalis, speckled with golden dots. The caterpillar is preparing to become a butterfly! This is what we call metamorphosis. The chrysalis finally tears open, revealing a butterfly with soft, crumpled wings. After four to five hours, the wings unfurl, allowing the monarch to take flight for the very first time!

DID YOU KNOW?

If a human grew as quickly as a monarch caterpillar, it would reach the size of the Statue of Liberty in just two weeks!



2.2 THE MONARCH'S LIFE CYCLE



2.3 A HIGHLY EFFECTIVE DEFENSE

Have you noticed the bright colors of the monarch caterpillar and butterfly? You'd think this would make them more vulnerable to their enemies but it's quite the opposite! These flamboyant colors send out a warning to predators like birds and mammals: Beware! Don't eat me, I'm poisonous!

Most animals avoid eating milkweed, as it contains toxic substances. But not the monarch caterpillar. It feeds solely on milkweed leaves. That's how it becomes toxic in turn! And when the caterpillar turns into a butterfly, it too will be poisonous. If a bird eats a monarch, it may suffer from vomiting or diarrhea. It won't die, but it will surely learn its lesson: better not to eat any more of them!

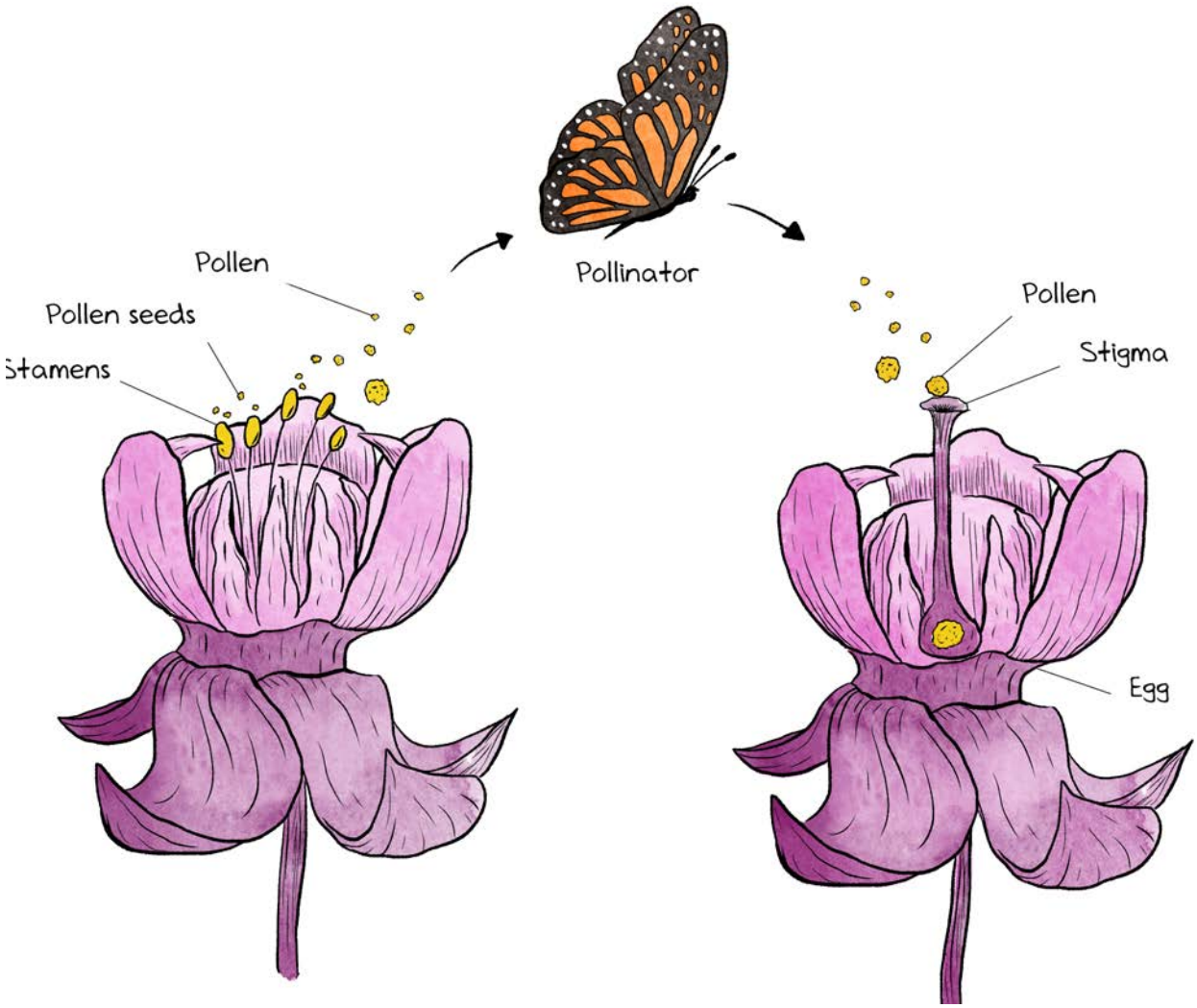
2.4 THE ECOLOGICAL ROLES OF THE MONARCH

Although toxic to most animals, the monarch isn't dangerous for spiders, a few wasps, and certain bird species, such as the grosbeaks in the film "The Legend of the Butterfly".

Like all butterflies, the monarch helps flowering plants, including milkweed, to reproduce. As they fly from flower to flower, they carry pollen grains on their bodies. This pollen enables the flowers to develop into fruits, such as apples, blueberries and pumpkins.

DID YOU KNOW?

Butterflies often take sunbaths. They unfurl their wings all the way to absorb the sun's energy, which they need to fly. Their wings act like solar panels!



3

A PRODIGIOUS MIGRATION



3.1 A UNIQUE JOURNEY

In Canada, there are two migratory populations of monarchs: one in the west of the country, and the other in the east. During the summer, the western population lives in British Columbia and Alberta.

The migration of the eastern Canadian population is the most spectacular. These monarchs spend the summer in southern Quebec, and the winter in Mexico. In the fall, they travel over 5,000 kilometers! During this long journey, some monarchs fly over vast expanses of water, mountains or deep canyons. Along the way, they must regularly land to rest and feed on nectar.

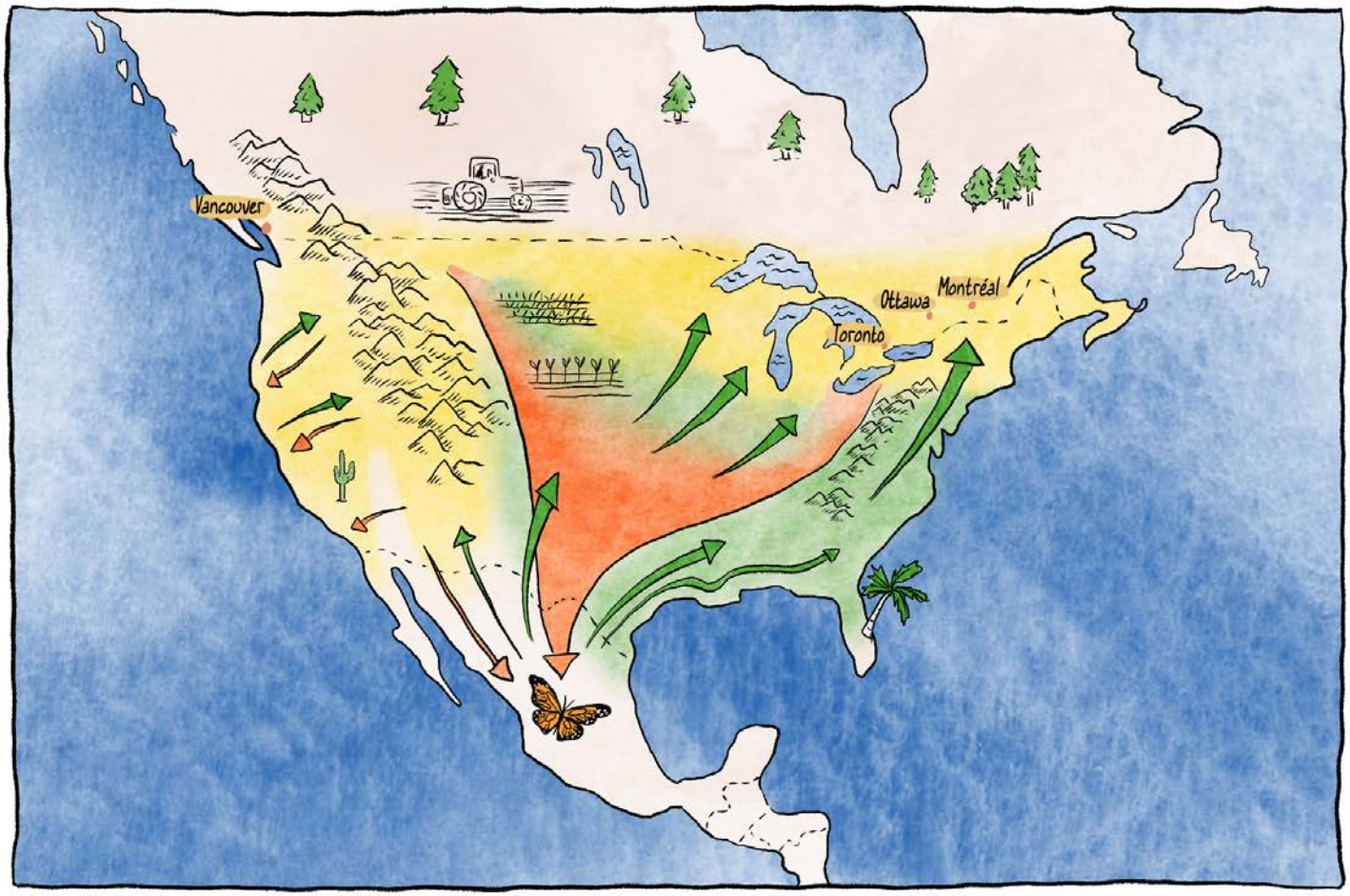
The heroes of the film "Butterfly Tale" accomplish this great feat despite all the obstacles in their way.

Patrick, for example, can't fly because he's got two wings that are smaller than the others. While Jennifer becomes panic-stricken whenever she flies too high. As for Martin, the funny caterpillar, he dreams of becoming a butterfly so he can fly with his friends.



3.2 SEASONAL MIGRATIONS

Map showing the migratory routes of the two monarch populations in the spring and fall.



Legend

- Wintering grounds
- Summer migration
- Fall migration
- Spring breeding grounds
- Summer breeding grounds

DID YOU KNOW?

Of all monarchs, those of Quebec make the longest **migration.**

4 AN ENDANGERED SPECIES



Over the years, the number of migratory monarchs has dramatically fallen. As a result, the monarch is now classified as an "endangered" species. Here's a list of the threats this butterfly must face. Some are natural but many are connected with human activities:

- The insecticides and herbicides used by gardeners and farmers can kill both monarchs and milkweed.
- The construction of cities leads to the disappearance of milkweed plants.
- Logging in Mexico's forests where the monarchs spend the winter.
- Climate change, caused by greenhouse gases, can lead to cold or heat waves, as well as droughts that are harmful to both milkweed and monarch butterflies.



The monarch population in western North America is the most highly threatened, having fallen by 99.9% between 1980 and 2021. While the eastern population declined by 84% between 1996 and 2014.

Fortunately, all of us can help the monarchs.



5

HELP PRESERVE THE MONARCH

Good news: there are several ways to save the monarchs. And some even you can do!

ARE YOU READY TO GET INVOLVED?

5.1 WHAT ARE SCIENTISTS DOING?

The Montreal Insectarium has launched the **Mission Monarch** program, allowing the public to count milkweed plants and monarchs, and share their data.

A U.S.-based monarch research and conservation organization attaches tags to the wings of these butterflies. As each tag bears a unique number, it's possible to follow the butterflies' travels when they are captured again. We can thus learn more about their **migratory** routes and preserve the areas frequented by the species.

But such tagging is for scientists only. Don't touch the butterflies - they're fragile creatures!



In 2017, Montreal became the first Canadian "Monarch-Friendly City". To find out if you live in a Monarch-Friendly area, visit the David Suzuki Foundation website.



5.2 WHAT ARE CITIES DOING?

Hundreds of cites and towns across Canada, the United States and Mexico have all pledged to protect the monarch.

Here are a few examples of what these cities are doing:

- Avoiding mowing city land (parks, schoolyards, public gardens, median strips...) where milkweed grows.
- Handing out free of charge milkweed seedlings to people for home planting.
- Creating flower gardens for pollinating insects.

5.3 HOW ABOUT YOU? WHAT CAN YOU DO?

When gardening with your family, avoid using chemical **herbicides** and **insecticides** to control weeds and insects. Such products pollute the environment and harm animals, both large and small.

You can also provide food for monarch caterpillars by planting milkweed at home. See page 33 for details.

To feed butterflies, you can create a milkweed garden or one with other **nectar-rich** flowers. See page 34 for details.

What's more, you and your family can reduce your climate-affecting greenhouse gas emissions by using less **fossil fuels,** such as oil and natural gas. Here are a few examples of things you can do:

- Switch off your computer and lights when you leave a room.
- Use light bulbs that consume less energy.
- Instead of using a gas-powered car, take public transit, walk or bike.
- Heat your home with electricity.





CLASSROOM ACTIVITIES

With the characters from the film "Butterfly Tale", here's a whole list of activities to be done in the classroom.

A - FROM THE EGG TO THE BUTTERFLY

B - OVERCOMING ONE'S FEARS

C - CROSSWORD PUZZLES

D - WORDS TO BE COMPLETED

E - THE FABULOUS JOURNEY OF THE MONARCH

F- ALL FOR ONE AND ONE FOR ALL!

G - MATH PUZZLES

H - A COLLECTIVE ARTISTIC WORK

I - FINDING YOUR WAY

J - INVENT A BOARD GAME

K - COLOR A CATERPILLAR

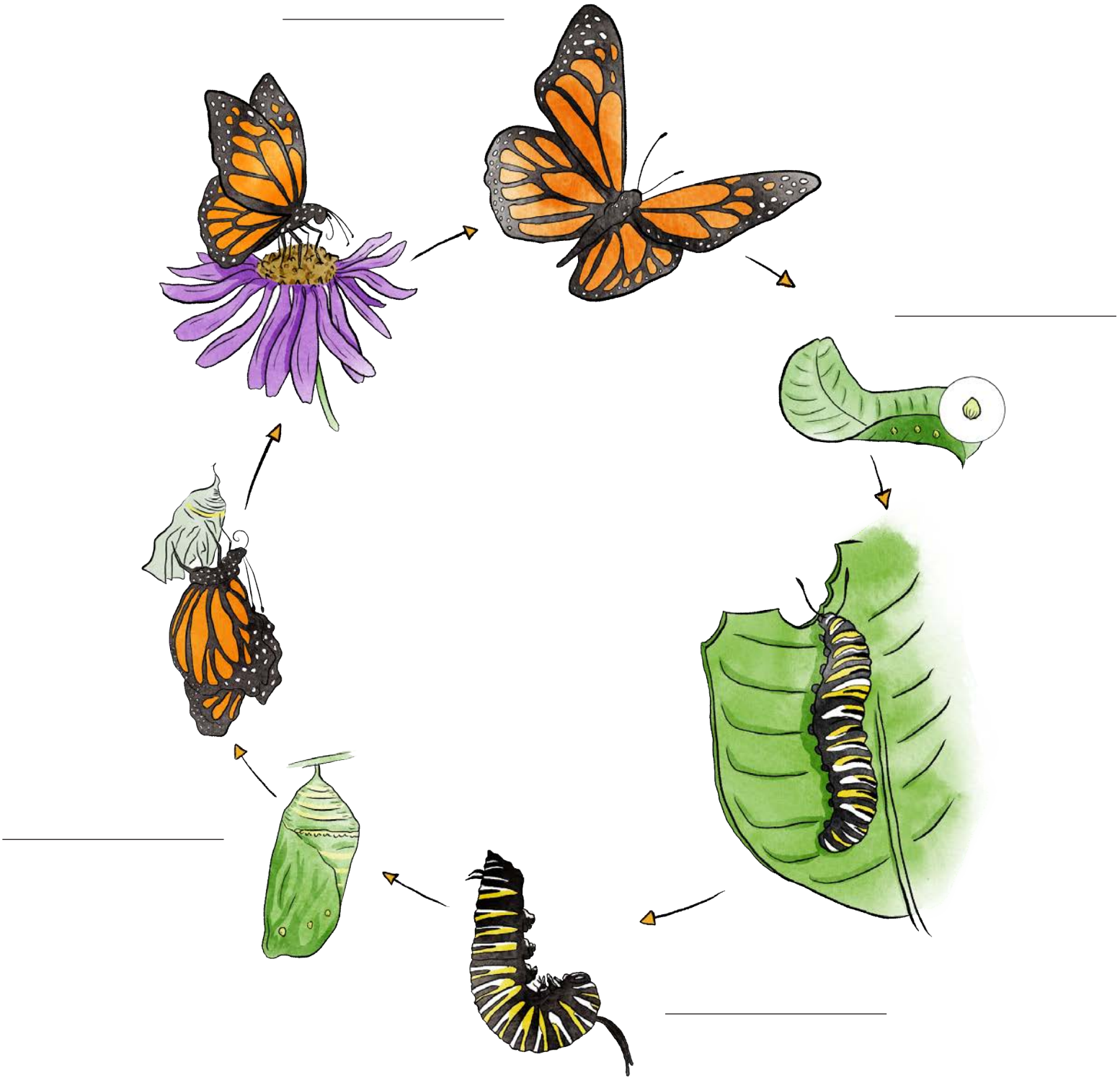
L - SENSATIONAL INSECTS

M - COLORING ACTIVITIES

A - FROM THE EGG TO THE BUTTERFLY

Examine the below illustration. It shows the different stages of monarch development. Can you name each correctly?

A = chrysalis
B = egg
C = caterpillar
D = butterfly



B - OVERCOMING ONE'S FEARS

In the film **"Butterfly Tale"**, several characters succeed in overcoming their fears and going beyond their limits.

For example, Patrick, who can't fly because his wings are smaller than normal. And Jennifer, who has a dreadful fear of heights. Or Marty, the clumsy caterpillar who joins in on the migration before he's managed to turn into a butterfly.

Have you ever overcome your fears? How did you feel afterwards? If you like, tell your class about your experience.

To push your thinking further, do some research at the library or on the Internet to find out how certain famous people achieved their goals despite all the obstacles they encountered.



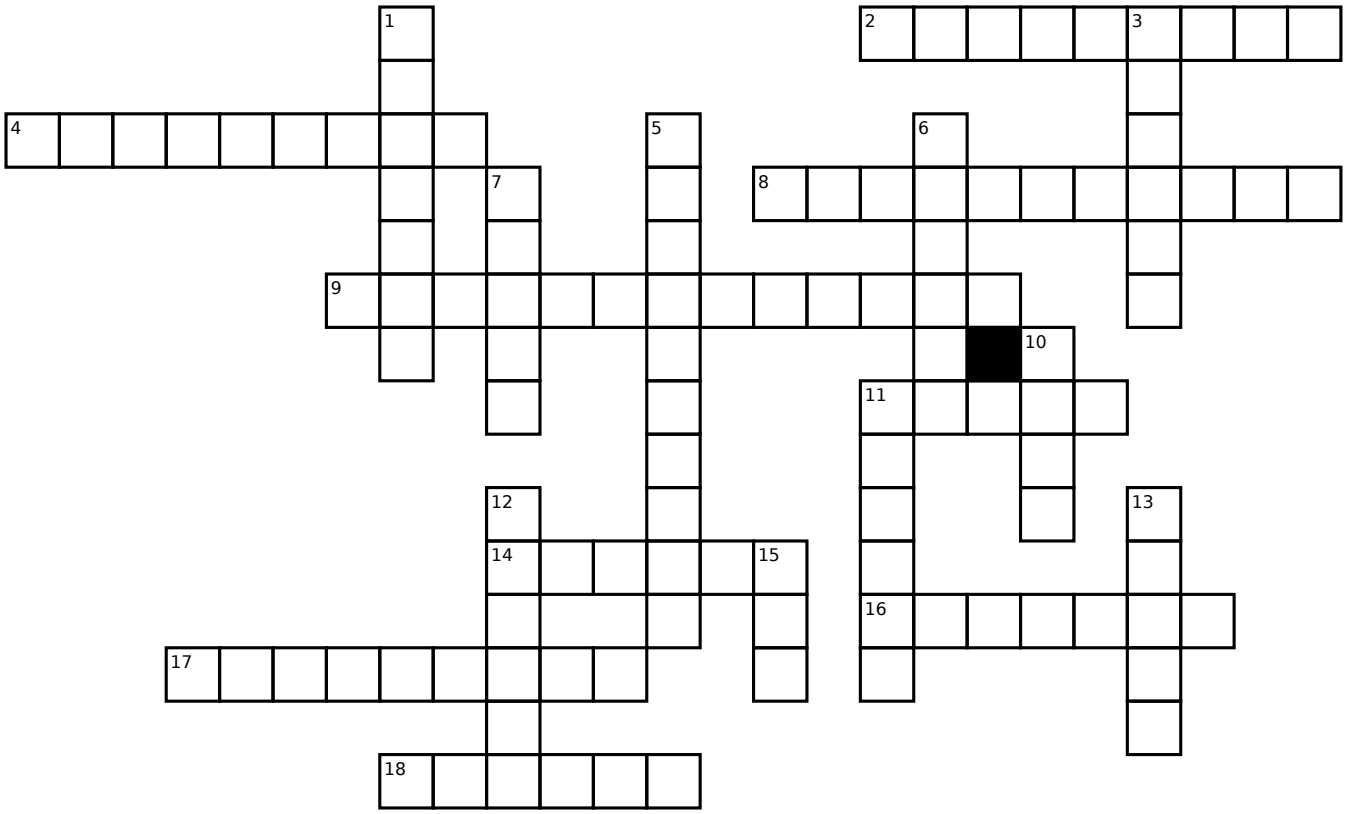
Present your findings in the form of a written text or oral presentation.

Here are a few suggestions:

Terry Fox, Mikaël Kingsbury, Maurice Richard, Wayne Gretzky, Joannie Rochette, Jane Goodall, Marie Curie, Katherine Johnson, Stephen Hawking, Albert Einstein, Rosa Parks

C - CROSSWORD PUZZLES

Answer the questions and complete the crossword puzzle below. All the words refer to the monarch and the milkweed.



DOWN

1. The end of an insect's body.
3. Small coloured structures on butterfly wings.
5. Annual journeys made by butterflies.
6. Country where monarchs spend the winter.
7. Color of monarch veins.
10. Matter produced by caterpillar mouth.
11. Part of an insect's body between the head and the abdomen.
12. Small grains produced by flowers.
13. Parts of the butterfly's body that enable it to fly.
15. Organ of vision

ACCROSS

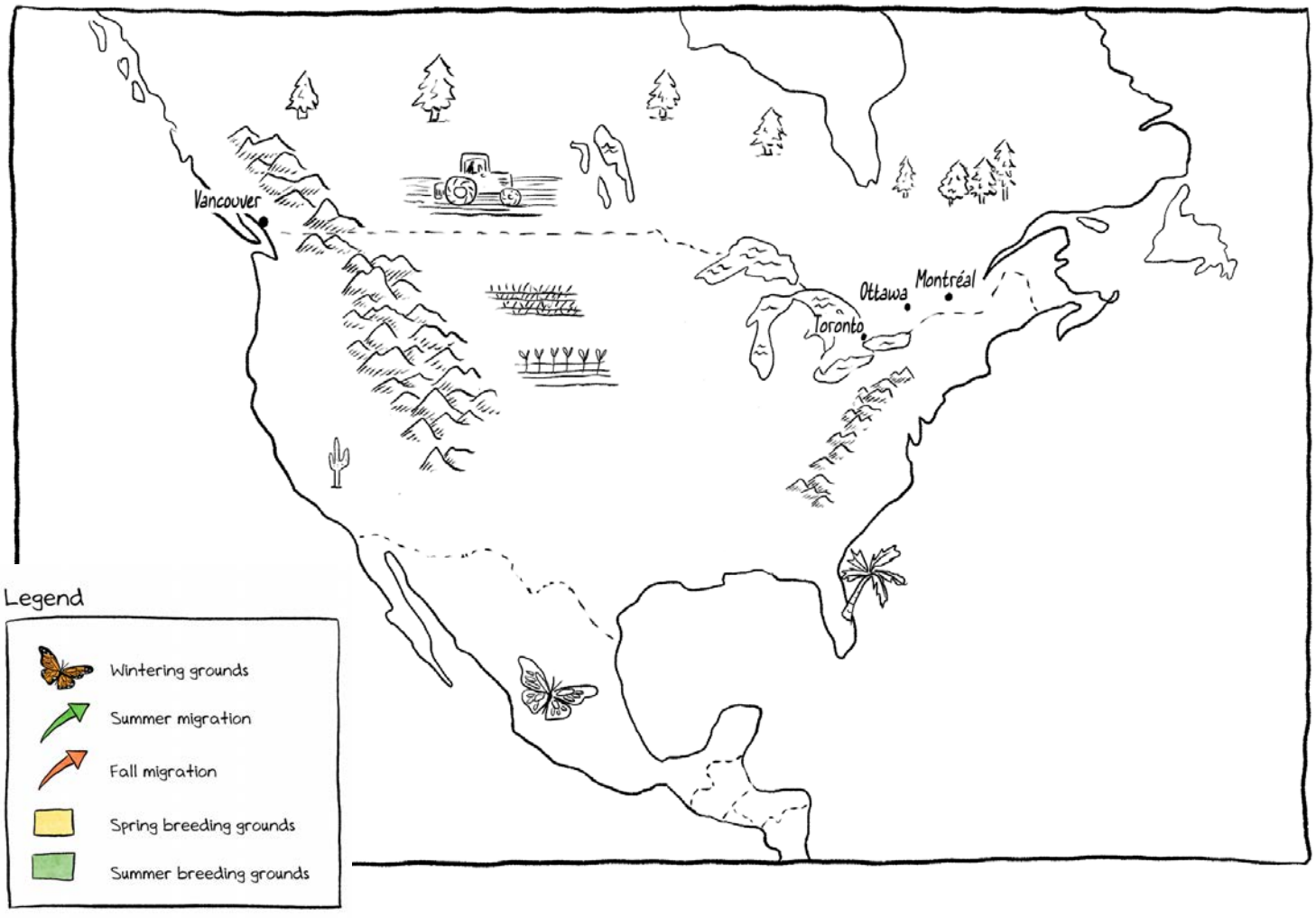
2. Organ with which the butterfly feeds.
4. Plants on which the monarch lays its eggs.
8. Name of butterfly larva.
9. Transformation of caterpillar into butterfly.
11. Characteristic of milkweed that protects it from grazing animals.
14. One of the colours of the monarch butterfly.
16. Butterfly organ for touching objects and picking up odours.
17. Stage of monarch development from which the butterfly emerges.
18. Season during which the monarch goes to Mexico.

D - Test your knowledge of the monarch by completing the words in the following sentences:

1. The female usually lays a single e _ g per milkweed plant.
2. The monarch egg is _ i _ _ _c_ _ _. It measures 1.2 mm by 0.9 mm.
3. In the fall, monarchs go south because they can't bear the f _ _ _ t.
4. The v _ _ _ _o _ butterfly looks a lot like the monarch, but it's smaller.
5. Like the monarch, the painted-lady butterfly and the green darner dragonfly are _ i _ _ at _ _ y insects.

E – THE MONARCH'S FABULOUS JOURNEY

Here's a map of North America. Can you trace the path taken by the eastern Monarch population in the fall?



F - ALL FOR ONE AND ONE FOR ALL!

In a scene in the film "Butterfly Tale", Patrick guides Jennifer as she flies over a canyon. It's a wonderful example of cooperation.

Helping each other is often crucial when you have to go beyond your limits.

Do you think it's important to cooperate with others? Can you tell a story about how you worked with someone, like a friend, family member or classmate, to do something unique or special?

If you want to, present your story in the form of a short sketch.



G - MATH PUZZLES

Solve the below math problems:

1. What is the maximum distance monarch butterflies travel between southern Canada and Mexico during their fall migration?

   5 X (980+ 20) = _____

CALCULATIONS

2. How long does this journey take?

   (1022-10) – 1010 = _____ months

CALCULATIONS

3. How many months do monarchs winter in Mexico?

   (60 ÷ 2) – (5 X5) = _____

CALCULATIONS



4. What percentage of monarchs successfully migrate from southern Canada to Mexico?

   (100 – 14) – (30 + 5+ 1) = _____

CALCULATIONS

H - COLLECTIVE ARTISTIC WORK

With your class, create a collective work of art (as a group) inspired by the movie “Butterfly Tale”, like the moment when our heroes cross the waterfall, or fly over the Grand Canyon. For example, a painted mural or a large collage.

PUT YOUR IDEAS HERE



I - FINDING YOUR WAY

With your teacher and classmates, discuss how Patrick in the movie "Butterfly Tale" succeeded in coming up with his own flying technique to make up for his disability.

Then form teams and choose an athlete with a disability who plays a sport adapted to his condition. Do some research at the library or on the Internet and answer the following questions:

What sport does this athlete play? _____

What obstacles did he overcome? _____

What equipment does he use? _____

What victories did he win? _____

Example : Goalball players are visually impaired. To be able to locate the ball by sound, they play with a ball containing tiny bells.

J - INVENT A BOARD GAME

With your class, create a board game inspired by elements and characters from the movie "Butterfly Tale". Trace out a path made up of squares. The players move by shaking a die and following the instructions written on each square.

Materials : large stiff cardboard box, checkers, dice

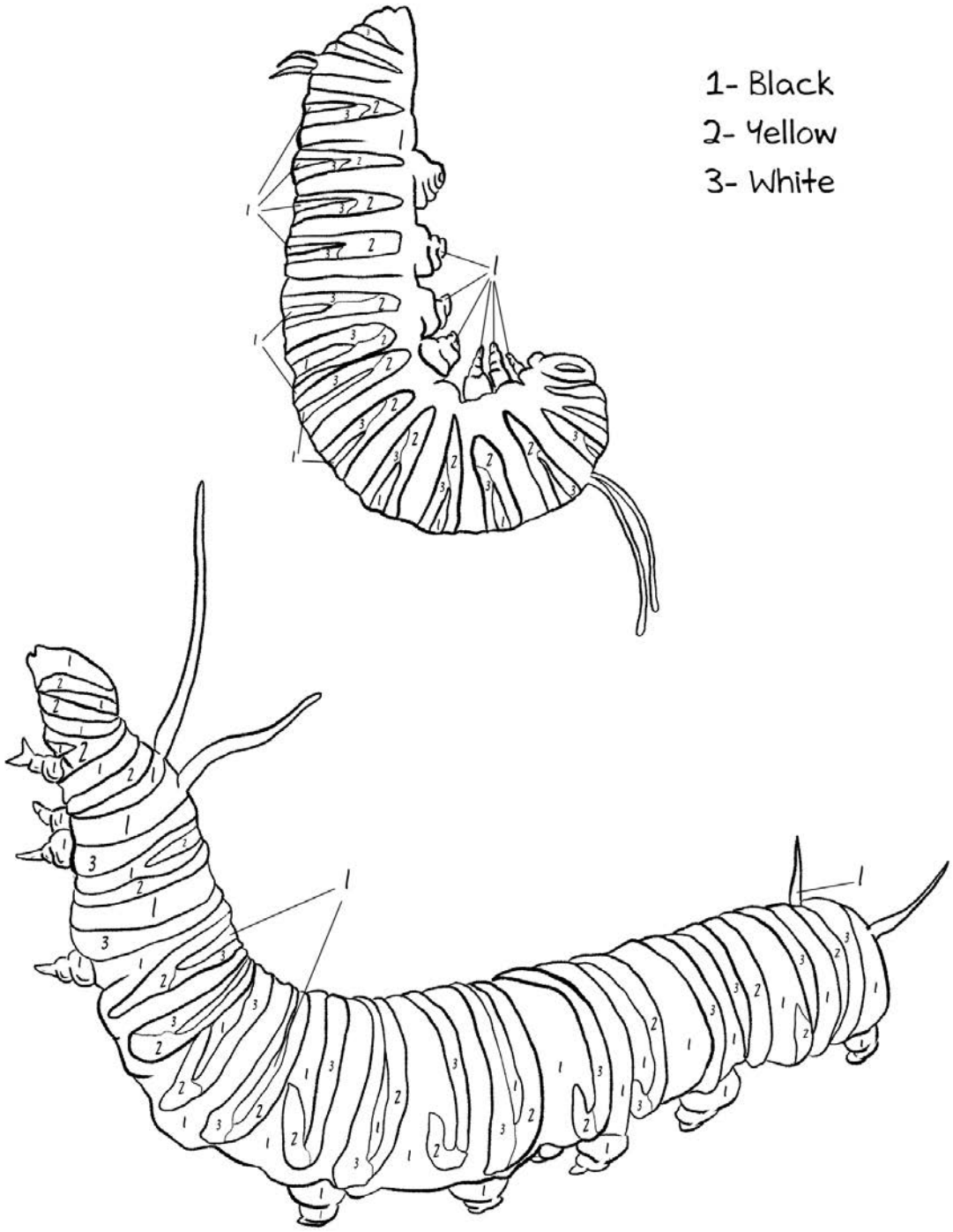


Examples of instructions:

- A tornado forces you to stay on the ground. Move back one square.
- Your caterpillar successfully completes its metamorphosis. Advance 2 squares.
- Your caterpillar is eaten by a spider. Move back 4 squares.
- You escape from a hungry mouse. Move forward one square...

K - COLOR A CATERPILLAR

Color the caterpillar by following this color code.





L - SENSATIONAL INSECTS

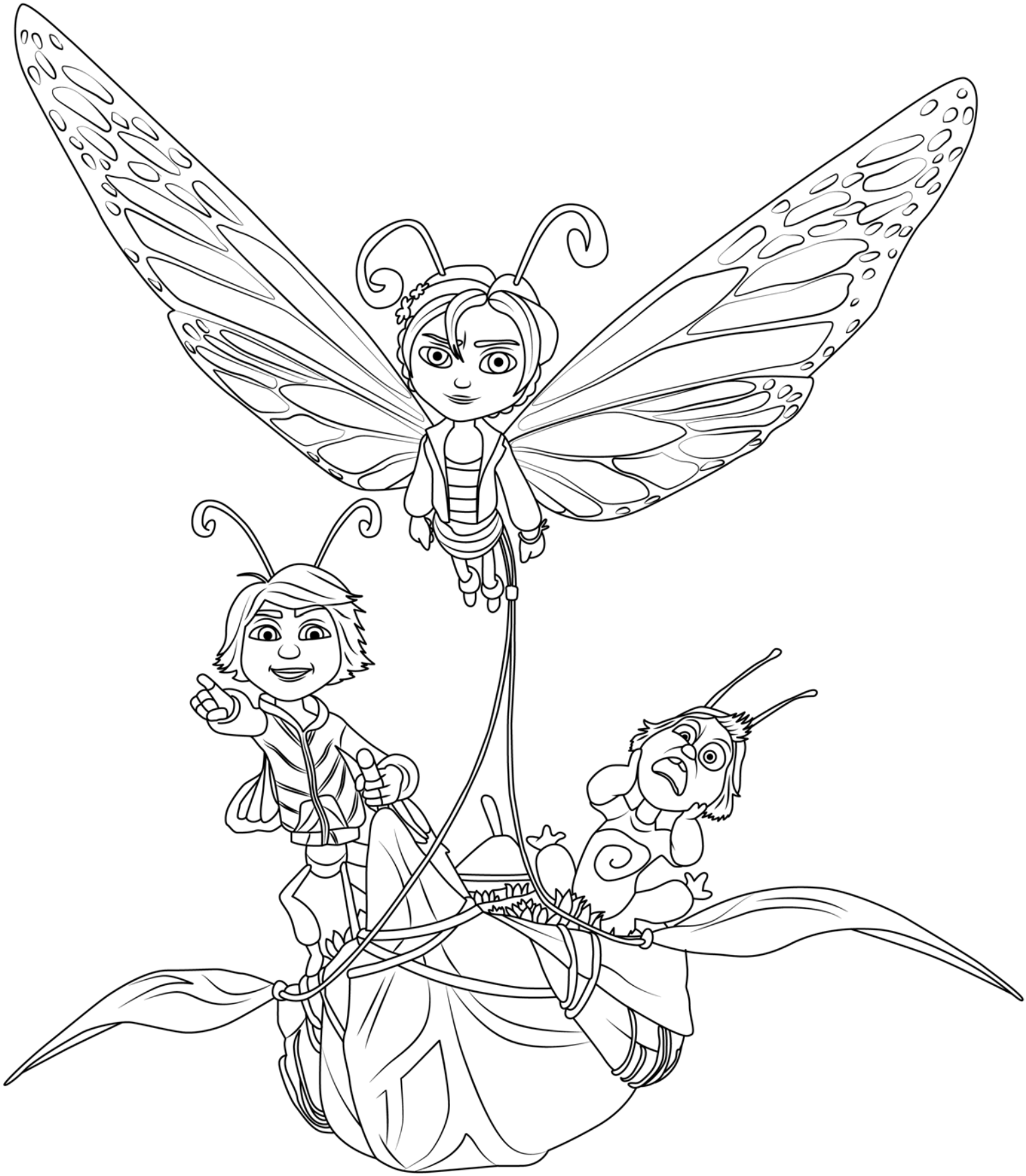
The monarch explores its environment using its sense of sight and smell. Read the below statements and write T (true) or F (false) to the right of each.

	TRUE	OR	FALSE
1. The monarch butterfly uses its sense of smell to locate milkweed flowers.			
2. The monarch butterfly has two eyes.			
3. The monarch caterpillar hears sounds thanks to the black filaments at the ends of its body.			
4. The monarch caterpillar has poor eyesight.			

M- COLORING ACTIVITIES

Color these drawings from the film **"Butterfly Tale"**











OUTDOOR ACTIVITIES

With the heroes of the movie "Butterfly Tale", here are some great outdoor activities for you.

A - DRAW THE MILKWEED PLANT

B - HELP MONARCHS BY PLANTING MILKWEEDS

C - INSECT SAFARI

D - CREATE A FLOWER GARDEN TO ATTRACT MONARCHS

E - MISSION MONARCH

F - DISCOVER MILKWEED FRUIT

G - HARVESTING MILKWEED SEEDS

A - DRAW THE MILKWEED PLANT

Seasons :
Spring, summer, fall

With your class or family, go into a field and look for milkweeds. If you find one, draw it. Look carefully at the shape of the leaves, flowers and fruit (if any).

Material:
drawing paper, pencils or crayons, eraser

In the movie “Butterfly Tale”, the illustrators drew milkweed in their own way. If you feel like it, draw a milkweed plant any way you like. Let your imagination run wild!



YOUR DRAWING

B - HELP MONARCHS BY PLANTING MILKWEEDS

Seasons : spring, fall

Why not help save monarchs by planting milkweeds in a garden or on school grounds? They are essential to the survival of monarchs, for they lay their eggs only on these plants. What's more, milkweed is the sole food that monarch caterpillars eat.

Milkweed seeds and seedlings can be found in many nurseries. It's preferable to plant indigenous milkweed species, that's to say those that grow naturally where you live.

Instructions for planting seeds are fully explained in the following guide, which you can find on the David Suzuki Foundation website.



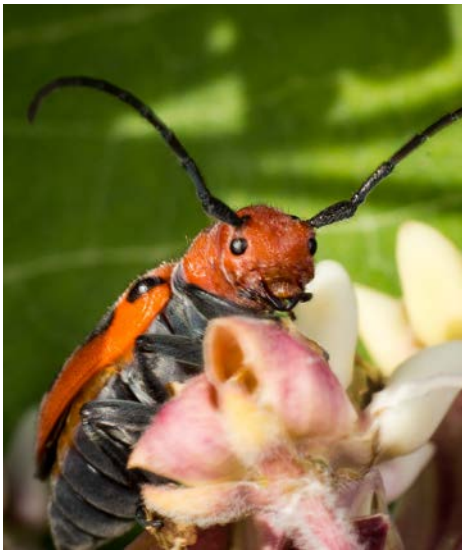
C - INSECT SAFARI

Seasons : spring, summer, fall

Go out and search for insects around milkweed plants. If you're lucky, you'll spot monarchs (eggs, caterpillars and adults) as well as other insects.

Look at the below photos. They represent three species of insects often seen on milkweed plants. Why do you think they are so brightly colored?

Red milkweed beetle



This red **beetle** with long antennae is speckled with black spots. The adult feeds on milkweed leaves.

Si on le dérange, il If disturbed, it produces a sound called **"stridulation"**.

You can touch it, as it's harmless.

Milkweed beetle



This **beetle** is brightly colored in orangey yellow and bluish black. It's adorned with elongated patches.

Milkweed beetles feed on every part of the plant.

Small milkweed bug



These bugs can be recognized by the red "X" on their back. They feed on milkweed **sap** and seeds.

D - CREATE A FLOWER GARDEN TO ATTRACT MONARCHS

Seasons : spring, summer

Have you ever noticed how many butterflies can be seen in gardens? They're attracted by fragrant, brightly colored flowers that produce lots of **nectar.** Here are just a few of the flowers you'll want to plant in your butterfly garden: lavender, sunflowers, violets, goldenrod, cosmos, asters, zinnia... without forgetting milkweed!

It's preferable to plant flowers that bloom not only in the spring and summer but also in the fall. In August and September, monarchs need to eat before setting off on their long **migration.** Butterflies also need to drink water. Try making a trough for them with a saucer filled with a mixture of sand and moist soil.



E - DISCOVER MILKWEED FRUIT

Seasons : summer, fall

Milkweed produces green fruit that turns brown as it ripens. If you open one, you'll see that it's full of seeds. Examine them. You'll see that each has a silk pappus. Feel how soft milkweed silk is! Can you guess what it's for?

Because milkweed silk is excellent for trapping air, it can be used as insulation for coats, mittens, sleeping bags and comforters!

Milkweed Fruit (before ripening)



Seed and silk pappi



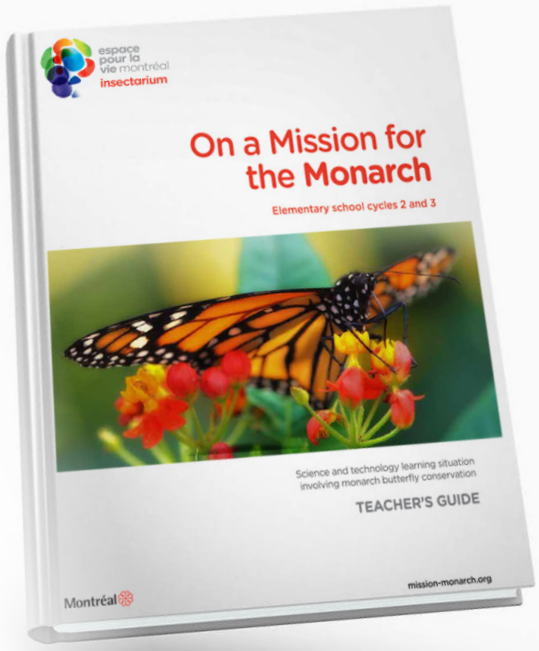
Open fruit



F - MISSION MONARCH

Seasons : spring, summer, fall

Note : In Quebec, monarchs are most abundant between mid-July and mid-August.



With your class or family, take part in Mission Monarch, a science project to census milkweed plants as well as monarch eggs and caterpillars. All you have to do is go to a spot where milkweed grows, count the monarchs and send the results in to the Montreal Insectarium. This data will enable scientists to learn more about monarchs and milkweeds, and thus better protect them.

All the necessary information (including the forms to be sent to the Insectarium) can be found in the following publication:

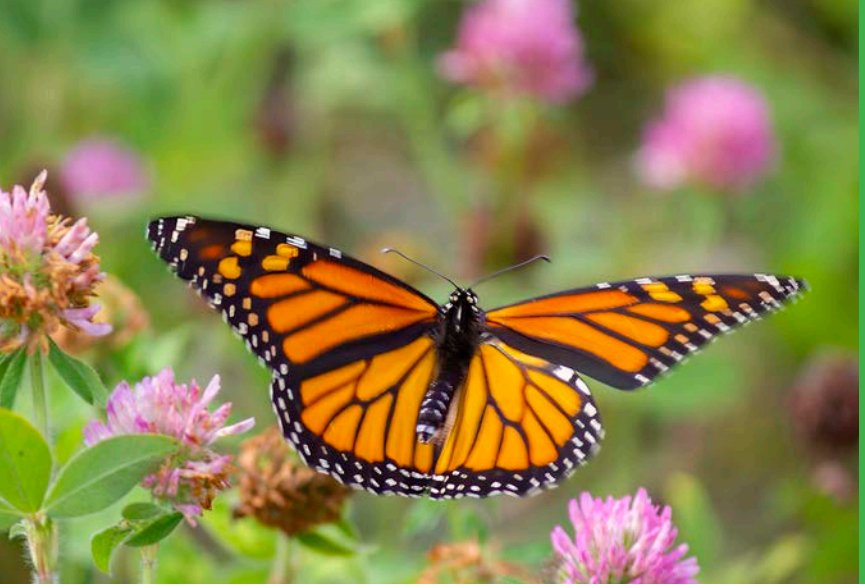
G- HARVESTING MILKWEED SEEDS

Seasons : fall

With your class or family, look for milkweed fruit that is nearly ripe. They are greenish or slightly brown in color. Squeeze the fruit gently with your hand to open it along the slit. If the seeds inside are brown, it's time to harvest them. Separate the seeds from their pappi and leave them to dry in the open air for a week. Then you can plant them.

Note : it's easier to plant these seeds in the fall (before the first frost) than in the spring.





GLOSSARY

Abdomen: the part of the insect body behind the legs.

Acquire: obtain

Chrysalis: development stage between a caterpillar and a butterfly.

Cocoon: in moths, the silk envelope in which the caterpillar turns into a butterfly.

Coleoptera: group of insects possessing flexible wings protected by rigid ones. For example: ladybugs, scarabs and may beetles

Diurnal: an animal active during the day.

Famine: widespread scarcity of food.

Filiform: shaped like a thread.

Greenhouse gases (GHGs): Gases present around the Earth that trap the Sun's heat. The surplus of GHGs is responsible for global warming. The use of fossil fuels (oil, coal, natural gas), as well as deforestation and agriculture all result in the emission of GHGs.

Herbicides: substances used to kill weeds.

Insecticides: substances used to kill insects.



Invertebrates: animals lacking a vertebral column and skeleton. Insects, spiders, jellyfish and crabs are all invertebrates.

Metamorphosis: in certain insects, transformation from larvae to adults.

Migration: journey made by certain animals in the fall and spring. Monarch butterflies, Canada geese, and flamingos are all migratory animals.

Nectar: sugar-rich liquid produced by certain plants.

Predators: animals that kill and eat other animals

Prolegs: a caterpillar's false legs.

Reproduction: biological process by which new individual organisms are produced from their parents

Sap: liquid with dissolved sugars that circulates in the vascular system of a plant.

Stridulation: high-pitched noise produced by rubbing together body parts in insects such as longhorn beetles, crickets and cicadas.

Toxic: poisonous

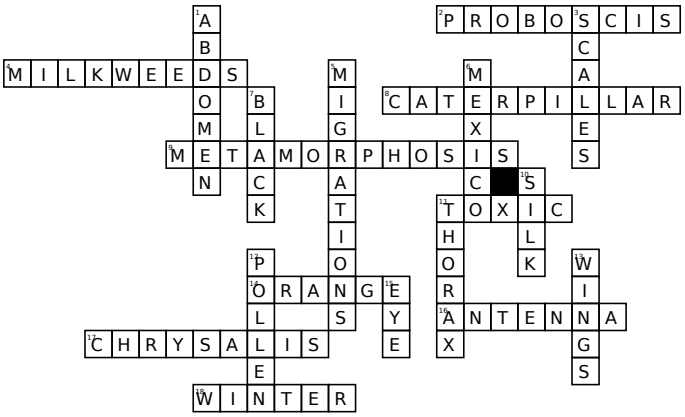
ANSWERS

CLASSROOM ACTIVITIES

A - FROM EGG TO BUTTERFLY

B, C, A, D

C - CROSSWORD PUZZLE



D - WORDS TO COMPLETED

1. egg
2. minuscule
3. frost
4. viceroy
5. migratory

G - MATH PUZZLES

1. 5000 km
2. 2 months
3. about 5 months
4. about 50%

L - SENSATIONAL INSECTS

1. F - The monarch is attracted by the milkweed's fragrant flowers but also uses its vision to locate them.
2. T
3. F - These filaments are used to touch objects.
4. T - It has 12 simple eyes called "ocelli" which are sensitive only to changes in light.

EDUCATIONAL GUIDE | THE MONARCH BUTTERFLY

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