



Monarch Butterfly

royal mail

manual for the environmental educator

A MANUAL FOR THE ENVIRONMENTAL EDUCATOR
MONARCH BUTTERFLY
ROYAL MAIL



THIS MANUAL WAS DEVELOPED AND TESTED BY VOLUNTEERS OF THE NON
GOVERNMENTAL ASSOCIATION "PROTECCIÓN DE LA FAUNA MEXICANA" (PROFAUNA A.C.)

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A SPECIAL THANKS TO SUSANA MENDOZA FOR INITIATION OF THIS PROJECT.

This publication is dedicated to
DAVID KNOTS
In recognition of his influence on the
professional development of PROFAUNA members
as conservation specialists.

SHARED RESOURCES

We, who work to protect our natural resources, often say "think globally and act locally." Perhaps it is because it captures the idea of what we must do in order to take care of our planet. If the actions that we take to protect the natural resources in our community are added to those taken in other places, no matter how far away they are, the combined effect will contribute to make the earth a better place for us and other living organisms. However, some people believe that individual action is insignificant in comparison to the magnitude of the "evils" that threaten our survival. For that reason, they prefer to combine their efforts by participating in a group project in which the members are able to exchange and communicate experiences and results. By working toward a common conservation goal of great significance, because of its impact in many different places, the group members also have the opportunity to create new friendships with participants located in different cities of the world.

Being aware of these advantages, we, in PROFAUNA, hope to create a network of local initiatives that establishes an International Conservation Network with the participation of children and teachers from Mexico, the United States and Canada. Our search for a common natural resource led us to select the Monarch Butterfly for this project: a migratory animal which guided by its need for water, food and shelter, travels long distances. Its annual journey provokes questions that are sometimes hard to answer: What guides the butterflies? Do they always follow the same route? How is knowledge transmitted from one generation to the next? What plants do they use for resting? And which ones do they use for feeding?

These insects, oblivious to political frontiers, are a resource shared by all of North America. They are also a shared responsibility. Knowing more about them, their routes, the risks to which they are exposed, and their needs, we can begin to effectively assist in their conservation.

Taking care of them during their migratory journey provides us with the opportunity to participate in a program that will have repercussions in our community and beyond. Seeing the results of our efforts doubled gives us greater hope that our future, which is linked to the Monarchs' future, will be a better one.

For that reason, PROFAUNA invites you to join this project. We ask you to send us information about the Monarch Butterfly's journey through your city. You and your students can provide data which will contribute to the protection of this species. We have provided you with information and activities which will help you develop the necessary skills to become better students and citizens.

HOW TO USE THIS MANUAL

As with other materials prepared by PROFAUNA, the present manual contains ideas that you can further develop with your creativity and experience. It is our hope that by carrying out the activities in this manual, the Monarch Butterfly can be protected during its journey through the cities that participate in the project. The activities were designed to be used during the months of September, October and November, during migration.

These activities highlight the following principles of Conservation Education:

- Environmental Appreciation and Awareness
- Principles of Ecology
- Conservation and Management
- Diversity of Values
- Social Responsibility

As with other materials provided by this Conservation Education program, these activities can be used in other areas and with other subjects in addition to the natural sciences and the environment, such as language arts, geography, mathematics, social studies and history.

This material offers the additional advantage of creating the opportunity for students to learn and use various means of communication, including mail services and the internet.

RECOMMENDATIONS

The work in the classroom is always unpredictable, mainly because of the students' unexpected questions. With this in mind, the background information section was prepared to provide important information for the development of the activities. Read these sections carefully.

Send us information about the butterfly's journey through your community and the questionnaires and activity reports completed by your students in a timely manner. This will enable us to prepare and send you a comprehensive report as soon as possible.

POETRY WITH WINGS

OVERVIEW

Students will write poems and rhymes using the vocabulary learned through their research or with the information about the Monarch Butterfly provided by the teacher.

BACKGROUND

Classification

Like any other living organism, the Monarch Butterfly has been classified beginning with its more general characteristics down to its most specific. Thus butterflies belong to the animal kingdom based on the following traits: their exoskeleton and jointed appendages make them Arthropods; the fact that they have six legs, two antennae, a head, thorax and abdomen classifies them as insects, the very small scales which cover their wings place them in the order Lepidoptera (Lepido = scale, ptheron = wing); and because of the type of veins on their wings, they belong to the family Danaidae. In this family, the Monarchs are the most abundant species. In 1758 Charles Linnaeus classified the Monarch Butterfly with the scientific name of *Danaus plexippus*.

Description

The Monarch Butterfly is reddish-brown with its wings edged in black and two rows of small white spots. Its forelegs are very short, without hooks and are not used for walking. Its eyes are composed of a great number of facets and its mouth is adapted specially for sucking. The body of the adult butterfly is covered with an unpleasant tasting fluid that serves to protect it from its predators.

LEVELS

Grades: PreK to High School

SUBJECTS

Elementary: Natural Sciences, Language Arts, Art.

Middle School: Biology, Language Arts, Art.

High School: Biology, Reading and Writing Workshop.

CONCEPTS

- Natural beauty, as experienced in the forest and other habitats enhances the quality of human life by providing artistic and spiritual inspiration, as well as recreational and intellectual opportunities.
- As organisms go through their life cycle of growth, maturity, decline, and death, their role in the ecosystem also changes.

SKILLS

Analysis, Synthesis, Comprehension, Writing, Communication, Observation, Teamwork.

OBJECTIVES

The students will learn about the life cycle of the Monarch Butterfly, and will write poems to express their thoughts and feelings about it.

MATERIALS

Writing and drawing materials, wooden clothes pins, orange crepe paper, cotton balls, popsicle sticks, pipe cleaners, egg cartons, play-doh

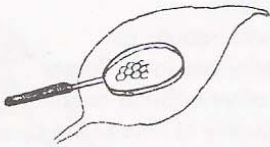
TIME REQUIREMENT

Two hours

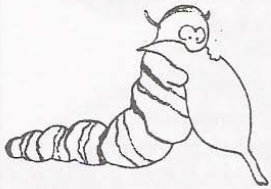
Life cycle

The Monarch, like all Lepidoptera, undergoes a complete metamorphosis or well defined stages of development before becoming an adult. The process of metamorphosis takes three to five weeks, depending on the environmental conditions, and it happens in the following stages:

a) Egg stage. The adult female lays more than 500 eggs on the back of the leaves of a specific genus of plants, the *Asclepias*, commonly known as milkweed. They generally lay one egg per plant. The size of an egg is similar to the period at the end of this sentence. It is white and cone-shaped. This stage lasts between three to twelve days, depending on the environmental conditions.



b) Larval stage. The larvae, also known as caterpillars, hatch from the eggs. Their heads are well-developed and they have black and yellowish orange stripes. Their cylindrical body is made up of thirteen segments. Their salivary glands are adapted to produce silk. At this stage, they feed on the *Asclepias* leaves, poisonous for most animals, but not for this caterpillar. On the contrary, the poison safely accumulates in their body to later protect them from birds, their main predators.



During the following two weeks, their development is very rapid. They increase in size 200 to 300 times. As a result, their skin becomes rigid, too tight for its size, causing it to shed five times. Once the right size is reached, they begin preparing for the next stage.



c) Pupa or chrysalis stage. In this phase, the larva stops feeding, leaves the plant where it was born and searches for an appropriate place to become a chrysalis. It empties its intestines and spins a small pillow beneath a branch from which it hangs from the back of its abdomen, forming a "J" shape with its body. The larva sheds for the last time and produces a silky thread to form the pupa that will encase and protect it.

Within an hour, it turns into a yellow-green chrysalis, and gradually changes shape, hardening and turning blue-green with gold and black spots. After eight to ten days, the chrysalis is translucent, making it possible to see the adult butterfly's wings.

d) Adult stage. After two weeks of apparent inactivity, the pupa/chrysalis breaks open and the butterfly emerges with damp and wrinkled wings. The butterfly starts to pump fluids to its wings so they will unfold and dry. When the wings become firm and reach their normal size, the adult is ready to fly and mate. Before doing so, however, the butterflies feed on the nectar of flowers from different species of plants.

ACTIVITIES

1. Using the attached diagram and the information above, explain the Monarch Butterfly's process of metamorphosis. Then, ask the students to make a list of adjectives to describe the butterfly's life cycle. Repeat the exercise using verbs and then nouns.

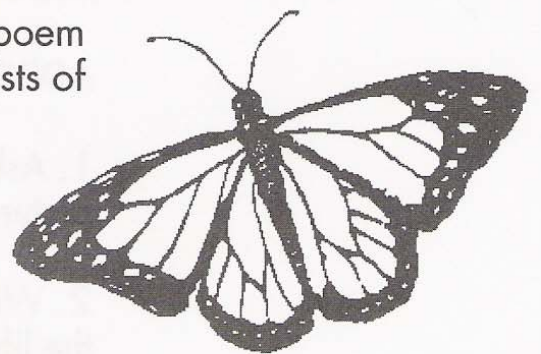
2. Ask the students to use the words from the lists created to write a poem in free verse, haiku, or cinquain. They can work individually or in groups.

A haiku is a Japanese lyric poem. It is an unrhymed poem whose emphasis is on the number of syllables. It consists of three lines in which:

- The first line has five syllables.
- The second line has seven syllables.
- The third line has five again.

A cinquain is a five line stanza. Its name is derived from the French word "cinq" which means five. Each line has a specific purpose and a specific number of syllables as explained below:

- The first line contains a title of two syllables.
- The second line describes the title and has four syllables.



- The third line is a description of an action in six syllables;
- The fourth line is a description of a feeling in eight syllables;
- The last line is another reference to the title in two syllables.

3. When they finish their poems, ask the students to read them out loud in order to share their feelings about the Monarch. Have the students review the poem or poems they have written and choose the one they like the best. Then assemble everyone's favorite poems into a book. You may want to create just one class book or you could run off enough copies for each poem so that each child can assemble his or her own book. You might make extra copies of the class publication to be distributed around the school and to parents. Please do not forget to send a copy to Prof fauna A.C.

4. Develop a list of similarities and differences between the caterpillar and the butterfly and write declarative statements with this information. For example:

- The butterfly has (wings, three pairs of legs, etc.)
- The caterpillar feeds on (milkweed leaves).

Discuss with your students the process of metamorphosis and find out about other animals that also metamorphose.

ADDITIONAL ACTIVITIES

1. Ask the students to illustrate their poetry with drawings or pictures.

2. With construction materials, make a model representing the life cycle of the Monarch Butterfly. Set up an exhibit with all the work done by the students so other groups and parents can enjoy it.

MAGICAL CHANGES

OVERVIEW

The students will learn about the life cycle of the Monarch Butterfly by memorizing a rhyme and by performing it with body movements.

BACKGROUND

See the background information for the previous chapter "POETRY WITH WINGS."

ACTIVITIES

1. Help the students memorize the following rhyme:

*Metamorphosis
From a small egg a caterpillar is born.
It eats and eats until it's fully grown.
Then it begins to work very soon
spinning and spinning its cocoon.
Soon it will sleep in a slumber so deep.
When springs arrives
a butterfly emerges and begins to exercise.
(Prof. Olga L. Saucedo)*

2. Once they memorize the poem, ask them to act out the various stages as it evolves from an egg, to a caterpillar, to a cocoon and to a butterfly, while they recite the rhyme.

3. Discuss what happened to the egg, the caterpillar, and the cocoon, and what will happen to the butterfly. Explain the process of metamorphosis, a process of change where none of the stages are similar. Explain that this process is common in insects and other animals.

LEVELS

Grades PreK–3

SUBJECTS

Natural Sciences, Language Arts, Art.

CONCEPTS

- Natural beauty, as experienced in forests and other habitats, enhances the quality of human life by providing artistic and spiritual inspiration, as well as recreational and intellectual opportunities.
- As organisms go through their life cycle, maturity, decline and death, their role in the ecosystem changes.

SKILLS

Comprehension, Memorization, Analysis, Similarities and Differences, Psychomotor Development, Creativity.

OBJECTIVES

The students will learn about the life cycle of the Monarch Butterfly using a rhyme.

MATERIALS

Paper and crayons for drawing, wooden clothes pins, orange crepe paper, cotton balls, popsicle sticks, pipe cleaners, egg container, play-doh.

TIME REQUIRED

1 hour

4. With pictures, compare the development of the Monarch Butterfly with your own development and discuss the following:

- In what way are they alike?
- In what way are they different?
- Where was the butterfly born?
- Where were the students born?

Introduce the concept of oviparous and viviparous and determine which animals belong to each category.

ADDITIONAL ACTIVITIES

1. Based on the information they now have on the life cycle of the Monarch Butterfly, ask them to write a story and then act it out or draw it.

2. Have the students practice the new vocabulary: caterpillar, metamorphosis, cocoon, change, larva, etc.

3. With art materials, ask the students to illustrate the butterfly's metamorphosis and set up an exhibit of the students' work.

MIGRATION

OVERVIEW

With information received from other participants, direct observation, the use of maps and known distances, the students will establish the route and the distance traveled by the Monarch Butterfly during its migration.

BACKGROUND

Migration can be defined as the periodic movement of an animal from the place where it lives to a new area with a subsequent return trip to its original home.

Animals migrate because of changes in their habitat such as lack of food, adverse weather conditions or because of special needs in their life cycle.

Animals that migrate have the capacity to move easily and generally use the same migratory routes. Depending on the animal, the routes can be by land, water or air. Migratory animals include birds, fish, mammals, reptiles, amphibians, and insects.

Animals that migrate over land must be able to travel long distances, and often have to cross wide rivers or climb very tall mountains. The swimmers, like salmon and whales, must struggle against currents in order to stay on course. They need strong muscles for that purpose.

Those that travel by air such as birds, bats and insects, like the Monarch Butterfly, encounter fewer obstacles, but most of them avoid long sea voyages or flying too high.

LEVELS

Grades 4-12

SUBJECTS

Elementary: Geography, Math, Language Arts.

Middle School: Math, Geography, Language Arts, Physics.

High School: Reading and Writing Workshop, Biology.

CONCEPTS

- Organisms are interdependent and depend on nonliving components of the Earth.
- Organisms adapt to changes in the environment according to the genetic and behavioral capacity of their species.

SKILLS

Observation, Teamwork, Information Gathering, Writing, Communication, Analysis, Categorization of Information, Hypothesis Forming, Synthesis, Utilization of Maps.

OBJECTIVES

The students will determine the route and distance traveled by the Monarch Butterfly during its migration.

MATERIALS

A big map of North America (Canada, US and Mexico), a tourist map (with road distances) of the states traversed by the Monarch, pictures or any colored illustrations of the Monarch Butterfly.

LENGTH OF TIME

Three months

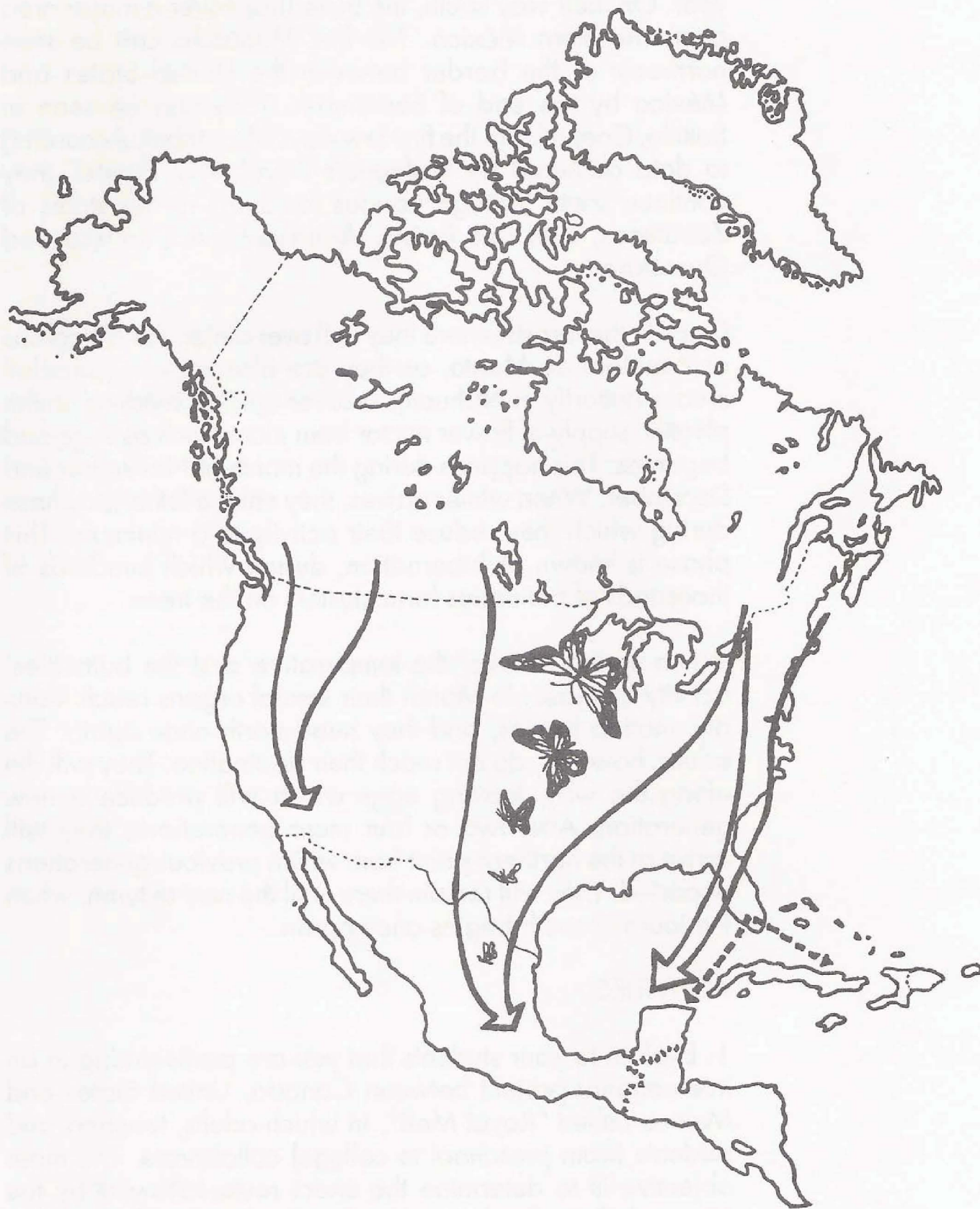
Migration of the Monarch Butterfly

The Monarch Butterfly is native to the North American Continent. It has also established itself in Hawaii, Samoa and Tahiti, as well as Australia and New Zealand, transported by ship or carried by the wind. The largest population is located in southern Canada and northern United States, from where it migrates every year. This interesting phenomenon begins every autumn as daylight hours shorten and temperatures fall, and the flowering plants on which these butterflies feed become dormant. The generation of butterflies born at the end of the summer undergoes hormonal changes which will inhibit the maturation of their sexual organs and prolong their lives up to eight months. Their migratory instinct is then awakened. The fat accumulated during the caterpillar stage will serve as an energy reserve to travel 2,500 to 3,000 miles. Depending on the wind, the butterfly will travel at a speed between 10 to 15 miles per hour for six to eight hours a day.

The trip south can follow three different routes. For the Monarchs that live west of the Rocky Mountains, migration will be to the state of California, near Santa Cruz and San Diego. Those that spend their summer between the eastern side of the Rockies and the Great Lakes, fly to México and overwinter in the states of México and Michoacán. The Monarch population that lives between the Great Lakes and the Atlantic Coast take the third route, through the Carolinas and Florida, and reach as far as the Yucatán Peninsula also in México. The exact place where they overwinter continues to be a mystery. The most important route because of the number of butterflies (100 – 150 million) leads to the Oyamel Forests (Douglas fir), located high in the mountains which form the neovolcanic ridge of México.

There are various hypothesis about how the Monarch Butterfly finds the same overwintering site year after year. One suggests that because of the magnetic material in their head and thorax, they can detect the magnetic differences that exist in the mountains with mineral deposits, as in the case of the states of Michoacán and México.

FALL MIGRATION AND OVERWINTERING AREAS



Another hypothesis holds that they are guided by the polarization of the sun's rays which varies throughout the calendar year. On their way south, the butterflies cover a major area of northeastern México. The first Monarchs can be seen northeast of the border between the United States and México by the end of September. They can be seen in Saltillo, Coahuila, in the first few days of October. According to data gathered by Profauna's Royal Mail Project, they continue south through various locations in the states of Zacatecas, San Luis Potosí, Aguascalientes, Jalisco and Querétaro.

Once in the forests where they will overwinter, the Monarchs or Papalota de Monte, as they are also known, (papalotl means butterfly in Nahuatl), recover quickly, feeding on the plentiful supply of flower nectar from plants such as sage and begonias. This happens during the month of November and December. When winter arrives, they enter a lethargic phase during which they reduce their activity to a minimum. This phase is known as hibernation, during which hundreds of thousands of butterflies form clusters on the trees.

When spring arrives, the temperature and the butterflies' activity increase. In March their sexual organs reach maturity, mating begins, and they head north once again. The adults, however, do not reach their destination. They will die along the way, leaving eggs which will produce a new generation. After two or four more generations, they will arrive at the northern point from which previous generations departed. They will remain there until the next autumn, when the journey south begins once again.

ACTIVITIES

1. Explain to your students that you are participating in an international project between Canada, United States and Mexico called "Royal Mail", in which adults, teachers and students (from preschool to college) collaborate. The main objective is to determine the exact route followed by the Monarch Butterfly during its migration, and with the information gathered, create programs for their protection.

2. Explain to your students that during the Monarch's migration period, the Royal Mail participants will exchange information, and to achieve the proposed objective, it is important to do the following:

- Become familiar with the Monarch Butterfly by studying photographs and illustrations in order to recognize it with accuracy.
- Be alert to their arrival in the community. The students who see them must write down the date, time, place and weather conditions (sunny, cloudy, cold, etc.) and discuss this information with their classmates.
- When the Monarch arrives in their community, they should notify PROFAUNA, A.C., at Apartado Postal 486, Saltillo, Coahuila, Mexico, C.P. 25000.
- As they receive information about other places and dates when the Monarch Butterflies were seen, they should mark them on a map in order to begin tracking their route.
- They should determine the miles covered per day, using known distances between one place and another (maps in which distances are indicated can be obtained from tourism offices).
- Students will be notified when the Monarchs arrive at the sanctuary. Their arrival should be indicated on the map the class has been using to show the migration route.

3. Having completed those tasks, the class should trace the trajectory directly on a map of North America, from its starting point in Canada to its conclusion in Mexico.

4. Next, ask your group to analyze the compiled data and draw conclusions on the migration pattern, for example: What route did the butterflies follow? How long did they take to complete it? How many miles did they cover? What was the average distance traveled daily? Did the weather affect their journey? Develop a hypothesis in relation to this point. Once the analysis is completed, ask them to write a report and send it to PROFAUNA A.C. They will receive a general report by mail containing data from all the participants.

5. Ask your students to find out the following information about each state that the Monarch passes through during its migration:

- Major cities, territorial extension, major geographic points (mountains, rivers, etc.), principal type of vegetation, weather conditions during migration, fauna, and any other interesting information.

With the data obtained, they can hypothesize about:

- The length of time it will take to move through the state, possible trees where the butterflies may rest, risks which the butterflies may face (rains, lack of adequate shelter), miles covered daily.

6. Ask the students to provide a description of the places the butterflies overwinter in the Neovolcanic Axis, as well as an estimate of the time that the Monarchs will remain in their sanctuary.

ADDITIONAL ACTIVITIES

1. Write articles for the school's newspaper or bulletin board to inform the students of the butterflies' trajectory, highlighting their stay in your community. Organize a festival welcoming the Monarchs to the community.

2. At the end of the research project, design a poster or mural which provides the information gathered through direct observation and exchange, emphasizing the school's participation in an international project.

NORTH/SOUTH

OVERVIEW

The students will act out the migration pattern of the Monarch Butterfly using a game and their sense of direction.

BACKGROUND

See the background information in the previous chapter on "MIGRATION."

ACTIVITIES

1. Ask your students what they know about the Monarch Butterfly. Ask them about its migration and the places where they believe it goes. Discuss the information from the background section to supplement their knowledge.
2. After the discussion, take your students to the playground or any other place with enough space where you have *previously* marked the butterflies' northern point of departure, Canada. In the extreme opposite, approximately 50 m., mark the southern point, México.
3. Separate four students from the group. Tell the others to pretend they are Monarch Butterflies that live in the north, Canada. The first freeze and snowfalls have begun to take effect, announcing the arrival of winter and alerting the butterflies to move south to México. Ask them to cover the distance traveled by the butterflies, running or walking, and moving their arms as if they were fluttering.
4. Have the four children remaining enact some of the dangers that the Monarch Butterfly will experience during its trek south. For instance, one of them can be the child who

LEVELS

Grades Pre K-3

SUBJECTS

Natural Sciences, Language Arts, Physical Education, Art, Social Sciences

CONCEPTS

- Organisms are interdependent, and depend on nonliving components of the Earth.
- Organisms adapt to changes in the environment according to the genetic and behavioral capacity of their species.

SKILLS

Analysis, Observation, Manual Skills, Creativity, Information Gathering, Comprehension, Problem Solving.

OBJECTIVES

The students will learn about the migratory phenomenon of the Monarch Butterfly, and will identify the dangers to which the butterflies are exposed during migration.

MATERIALS

A space at least 50 m long and 20 m wide, a large map of North America or use map attached, graphics of the Monarch Butterfly any object that simulates a tree branch, a plastic bag, a cardboard circle to represent the steering wheel of a car, posterboard, crayons.

TIME REQUIRED

50 minutes

kills butterflies with sticks or stones (he or she must use a soft object that does not harm classmates when they are struck).

Another should have a plastic bag to represent those who trap butterflies; the third will represent bad weather (cold, rain, wind); the fourth will represent a car, driving on the road (thousands of butterflies die in collisions with cars). Any students being affected by these "dangers" will drop out of the game.

5. The students who reach the beautiful forest where they will spend the winter, can be allowed to rest 30 seconds. Then, tell them that spring has come and now they must return north. At this time, include the students who had been eliminated from the game. They will represent the beginning of a new butterfly generation. The students enacting the "dangers" will continue playing their role since the dangers persist.

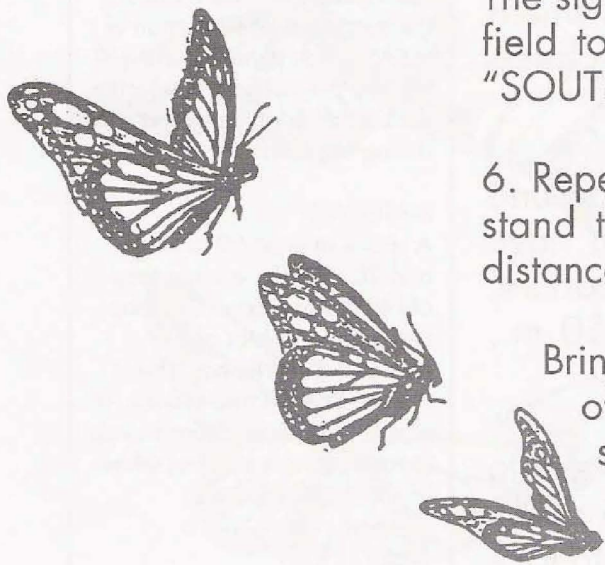
The signal to make the students move from one side of the field to the other is the spoken command "NORTH" or "SOUTH."

6. Repeat the game several times, until the students understand the concept of migration and the extremely long distances that the butterflies travel during their voyage.

Bring the activity to a close by discussing the significance of migration and emphasizing the reasons it is necessary and the dangers to which the Monarchs are exposed. Ask them to identify which dangers can be avoided and which can be minimized.

CLASSROOM ACTIVITIES

1. Explain to the students what the Royal Mail project is about.
2. Ask them to watch for the arrival of the butterflies in their city; to note the date and the time when they see them, to



observe if it is cold or hot, if it is sunny or cloudy, and to let you know.

3. Send a letter or email to PROFAUNA A.C, advising us of the Monarch's arrival. In return, you will receive news of the arrival of butterflies to other communities. Ask the students to mark the appropriate places on a map with butterflies. When they are informed that the Monarchs have arrived at their sanctuary, place a large butterfly on the final location.

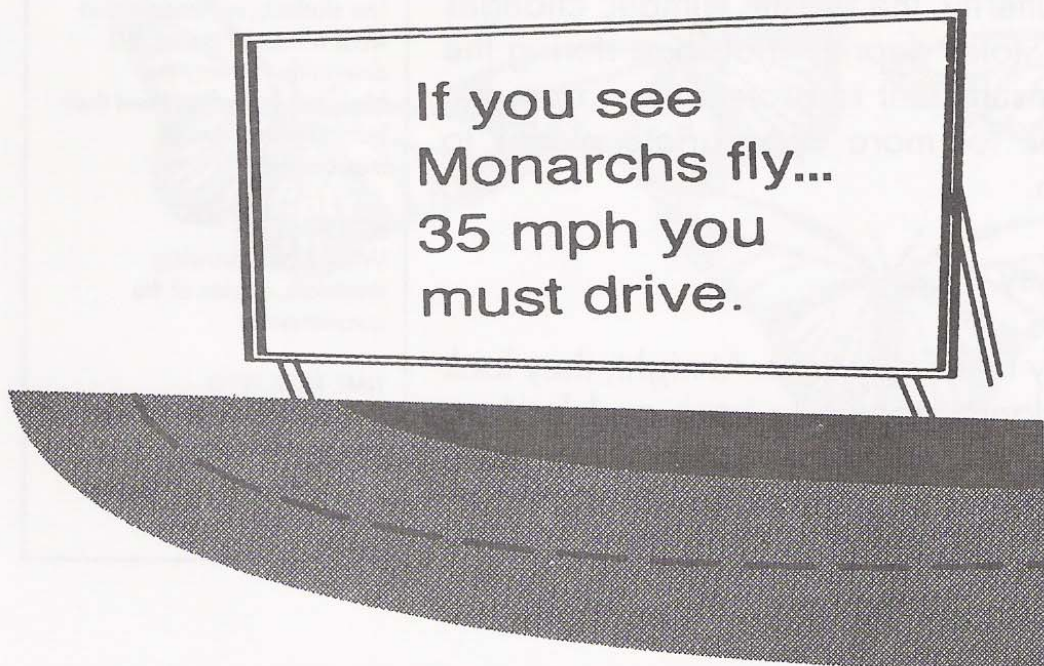
ADDITIONAL ACTIVITIES

Preschool and first grade

After the game, ask the students to draw a picture representing the migration pattern of the Monarch butterfly and the dangers to which they are exposed during their journey. Organize an exhibit and invite other students to come see it.

Second and third grade

Ask the children to make pictures which depict the dangers encountered by the butterflies during migration, and to write captions underneath, asking other children not to kill or capture them. With all the pictures, set up an exhibit to be visited by other students in the school.



THE BUTTERFLY TREE

OVERVIEW

Students will design a research project which will allow them to determine how the butterflies satisfy their habitat needs along the migratory route.

BACKGROUND

Habitat

All organisms (plants, animals, including human beings) require food, water, shelter and space to survive. The place where the organism finds these elements, accessible in enough quantity and quality, is called its habitat. Because each species of plant or animal has different requirements, the habitat varies from one species to another.

Migratory Animals and Habitat

Animals that migrate do so because their habitat does not meet their needs during certain periods of the year. In the case of the Monarch Butterfly, the drastic climatic changes in Canada and United States deprive it of food during the winter. Shelter is also insufficient to protect them from the cold. So they must look for more appropriate places to spend the winter season.

Refuge During the Journey

The butterflies travel only in the day time. At night, they look for shelter in certain plants, generally trees and bushes. There they rest in close proximity to one another, clustering in order to protect themselves from the cold.

LEVELS

Grades 4–12

SUBJECTS

Elementary: Natural Sciences, Language Arts, Social Studies and the Environment.

Middle School: Biology, Language Arts, Social Studies.

High School: Biology, Scientific Research Methods, Reading and Writing Workshop.

CONCEPTS

- International cooperation directed toward conserving resources and protecting the quality of the environment is beneficial to human health and the well-being of other life forms.
- Our increasing knowledge of the Earth's eco-systems influences strategies used for resource management and environmental protection.

SKILLS

Observation, Data Collection, Problem Solving, Analysis and Synthesis of Information, Comprehension, Creativity, Team Work, Social Service.

OBJECTIVES

The students will understand what a habitat is and will determine the way the Monarch Butterflies meet their habitat needs during migration.

MATERIALS

Writing and drawing materials, copies of the questionnaire.

TIME REQUIRED

The time Monarchs stay in your community.

During rainy or very cold days, the butterflies do not travel. They remain on the trees and only move during the warmer hours. The plants that they select to rest on differ in species and size (walnut, pine, weeping willow, mesquite, etc.) In Saltillo, we have seen that they use the same trees every year. It is very important for us to know what plants the Monarch uses as food and shelter in order to implement conservation programs along the route and prevent unnecessary losses of the Monarch during the migration period.

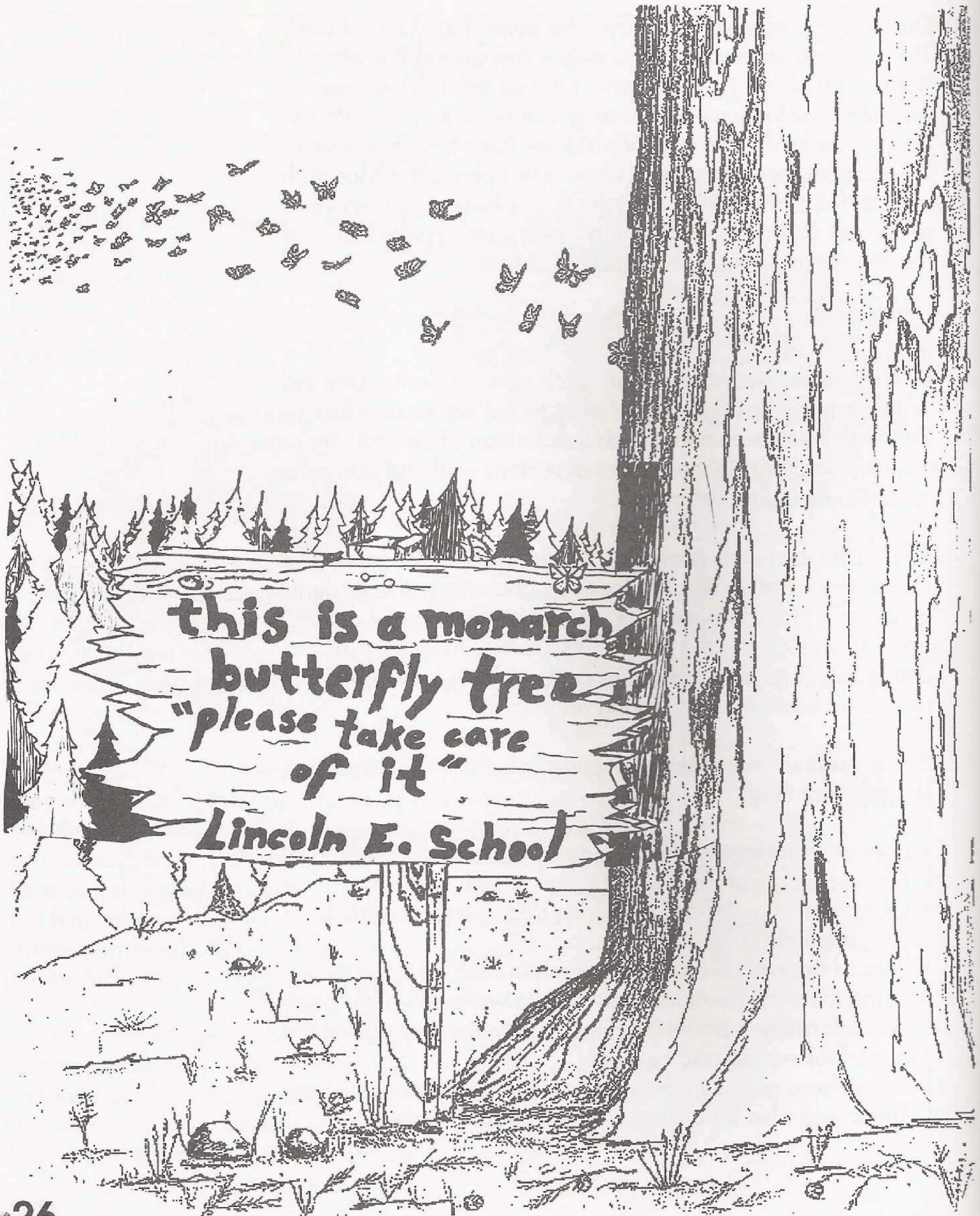
ACTIVITIES

1. Discuss the word "habitat" with your students. Use the data from the background section to collect more information. Ask them to come up with a definition of habitat. Then, ask them to describe the habitat of various wild and domestic animals, including their own.

2. Discuss how the Monarch Butterfly meets its food and shelter needs throughout its journey. Encourage the students to research ways to determine which plants are useful as food and/or shelter for the butterflies during their stay in the community. The data that you collect will let us know the types of habitat that are used during migration.

3. To help your students accomplish this objective, we suggest that they:

- Become familiar with the Monarch Butterfly by looking at pictures or graphics.
- Obtain a copy of the butterfly tree questionnaire from you, the teacher.
- Record the arrival of the Monarch in their community.
- Using the questionnaire, they should write down the pertinent information about the plants where they have seen the butterflies eating and resting.
- Draw these plants in detail. One drawing for each plant. This could also be done by taking photographs.



this is a monarch
butterfly tree
"please take care
of it"

Lincoln E. School

4. Once the butterflies have ended their stay in your city, compile and analyze the information collected and write down your conclusions. Send your report and worksheets as soon as possible to:

ROYAL MAIL PROJECT
PROFAUNA A.C.
A.P. 486
SALTILLO, COAHUILA, MEXICO
C.P. 25000

Email Address: correal@mcsa.net.mx

ADDITIONAL ACTIVITIES

1. Collect the drawings or pictures of the plants that serve as food and/or shelter for the Monarchs, and set up an exhibit in order that the community may become familiar with the plants the Monarchs prefer.
2. Make posters to be displayed near the trees or bushes where the butterflies were seen, asking people to cooperate in protecting both the plants and the butterflies.
3. Write an article about the plants that Monarchs use for food and shelter and send it to the local newspaper.
4. Create your own "butterfly garden" by collecting the seeds of these plants and then growing them in a greenhouse or in the school garden. If you have a surplus of plants, you can give them away to other schools or to people in the community.
5. The older students can prepare a conference for the entire school.

DO YOU KNOW WHERE THE MONARCH'S REST?

OVERVIEW

By direct observation and with the help of their parents the children will discover how the Monarch Butterflies find food and shelter during their journey.

BACKGROUND

See the background information in the previous chapter "THE BUTTERFLY TREE."

ACTIVITIES

1. Ask the students to watch for the arrival of the Monarch Butterflies to their community. Beforehand, draw a tree on the four sheets of poster board or obtain a dry tree branch and put it in the classroom. With suitable construction paper, have each child make at least one butterfly, approximately 10 cm in size.

2. Explain to the students that when they see the butterflies they must note, if they are flying or are settled on a plant. Ask them to observe the plants carefully and determine if they are weeds, bushes or trees, and the place where they are located (a garden or yard, a park, a vacant lot, etc.). With the help of an older person, ask them to find out the plant's name and height. If possible, provide them with a copy of the butterfly tree questionnaire.

3. Allow the students who report sightings of the Monarchs to place a butterfly on the posterboard or on the tree branch. Ask the students what the butterflies were doing while resting. If no activity was apparent, encourage them to suggest reasons why the butterflies would be on the plants.

LEVELS

Grades PreK-3

SUBJECTS

Preschool: Science Corner, Natural Blocks.

Elementary: Natural Sciences, Social Studies, and Language Arts.

CONCEPTS

- International cooperation directed toward conserving resources and protecting the quality of the environment is beneficial to human health and to the well-being of other life forms.
- Our increasing knowledge of the Earth's ecosystems influences strategies used for resource management and environmental protection.

SKILLS

Observation, Information Gathering, Classification, Oral and Written Communication, Analysis, Synthesis.

OBJECTIVE

The students will learn about the basic needs for the survival of living organisms, and will identify the plants used by the Monarch Butterfly for food and shelter during its migration.

MATERIALS

4 poster boards joined or a dry tree branch of appropriate size for the classroom; adhesive tape, copies of the Butterfly Tree questionnaire, one posterboard for the daily report, and orange construction paper.

TIME REQUIRED

3 months

4. Using the background information, discuss with the students why the butterflies migrate (to meet their basic needs: water, food, shelter, and space. Ask them to compare the butterflies' requirements with their own and the ways in which they meet their basic needs. Emphasize that the place(s) where these needs are met are called habitats. Ask them if the butterflies they saw settled on the trees were meeting shelter or food needs?

5. Ask the children every day about the butterflies they have observed, and record the data. If possible, place the information on the branch or picture.

The reporting sheet should contain: the date of the observation, the observer's name, plant where Monarch was sited, area occupied by the Monarchs, Monarch's activities and weather conditions.

6. Keep the butterfly migration map on display until the butterflies reach their sanctuaries. When this happens, prepare the final report and send it to PROFAUNA A.C. with a copy of the daily record and the butterfly tree questionnaires. Indicate how many students are in your classroom and how many saw the butterflies. If it is possible, send us a picture of your class with your butterfly tree.

ADDITIONAL ACTIVITIES

1. With the parents' help, make posters to display next to the plants where the butterflies were seen, asking people to take care of the plants as well as the butterflies.

2. Send the information to a local newspaper or invite a reporter to interview the class.

DAUGHTERS OF THE SUN

OVERVIEW

The students will investigate the significance of the butterfly for the early inhabitants of México and what beliefs about the butterfly persist today.

BACKGROUND

Archaeological discoveries and ancient manuscripts have familiarized us with the significance of the butterfly for the principal pre-hispanic cultures as demonstrated by their prominence in symbolic ritual and on objects of daily use.

The ancient Mexicans so highly valued butterflies that they were used as a form of tribute, if they were alive, as well as ornaments or jewelry. Butterflies came to represent heroes and important people that had died.

The Teotihuacana culture (200-900 A.D.) reproduced the butterfly on flat stamps, nose rings, headdresses, frescos on temple and palace walls, and on ceramic pieces like ceremonial pottery. Its representational form varied from the most natural to the completely stylized.

In the Toltec culture (900-1168 A.D.), it appears on the breastplates of colossal Tula warrior figures, known as Atlanteans, and was carved on the temples of Chichen-Itzá, the great ceremonial center of the Mayan culture.

The Mexíca people, later to become the Aztecs, reproduced butterflies on flat stamps, feather artisanry, small blankets, some manuscripts and stone engravings, and as a part of the warrior headdresses and shields. One of their many deities, "Xochiquetzal", goddess of happiness, flowers and

LEVELS

Grades 3-8

SUBJECTS

Language Arts, History, and Art.

CONCEPTS

- Cultural and social perspectives influence the attitudes, beliefs, and biases of people toward the use of resources and environmental protection.
- Most cultures have beliefs, values, and traditions that affect their interaction with the environment and its resources.

SKILLS

Research, Oral and Written Expression, Communication, Manual Skills, Visualization, Description, Interpretation.

OBJECTIVES

The students will learn about the significance of butterflies as mythical and ritual symbols for the principal pre-hispanic cultures.

MATERIALS

Notebook, pencil, books for research, materials for drawing.

TIME REQUIRED

Research time and two hours classtime.

housework, was represented with a human face and arms, and the body and wings of a butterfly.

The early Mexicans were very knowledgeable about butterflies' life cycles and the different species. They were even familiar with their different stages of metamorphosis.

In order to distinguish the different types of butterflies, they gave them different names. In some cases, they grouped several species by their similar habits or colors; others were grouped together in relation to their myths and legends.

The caterpillars, in general, were named "ocuilpapalotl de ocuilin" which means worm-butterfly. The chrysalis or cocoons were given the name of "cochipilotl" which means to sleep hanging, The butterfly itself was called "papalotl" which was part of another word which indicated its color or habit. For example:

<i>Itzpapalotl</i>	Obsidian butterfly
<i>Ixtapaplotl</i>	White butterfly
<i>Ichcapapalotl</i>	Cotton butterfly
<i>Matlalpapalotl</i>	Blue butterfly
<i>Cospapalotl</i>	Yellow butterfly
<i>Xiquipilchiupapalotl</i>	Butterfly that makes bags
<i>Zoquipaplotl</i>	Mud butterfly
<i>Tzonincanpapalotl</i>	Butterfly that stands on its head
<i>Tzahuanpapalotl</i>	Bird butterfly
<i>Quetzalpapalotl</i>	Monarch Butterfly

NOTE: The name given to the Monarch Butterfly by the Masahuas people meant daughter of the sun.

The butterfly was of such significance to the early Mexicans that they even named some places after them. For example, Papaloapan (River of the Butterflies), Papalotepec, a local region in the state of México, which means "Butterfly Hill" and Papalotipac and Papalotlan which means "Place Abounding in Butterflies."

Butterfly Legends and Myths.

Many of the butterfly myths and legends are related to the topic of death. The Aztecs believed that butterflies were in charge of taking warriors' souls, who died in battle or were sacrificed, and the souls of women, who died giving birth, to their resting place.



Teotihuacan figure made of baked clay with helmet like a butterfly.

Another surviving myth is of a dark brown butterfly which is abundant during the months of July through September, and is often seen resting on house walls. Many people believe that when these butterflies appear at a sick person's home, it means that person will die. They also think that they can cause illnesses like ringworm. It is known, however, that butterflies are harmless to one's health.

There are also several indigenous legends associated with the Monarch Butterfly. One of them claims that the Monarchs are the souls of children who have died and come back. Interestingly enough, the butterflies start arriving at their sanctuary on the 2nd of November, celebrated as the "Day of the Dead" in Mexico.

Still, another legend tells of a group of indigenous people that migrated from the Rocky Mountains to the center of México. Due to the intense cold, the children and the elderly could not continue the trip, and were left behind. To protect themselves from the cold, they covered themselves with tree resin and pollen. At that moment, their god appeared, and feeling sorry for them, turned them into butterflies so that they could more easily find their families. And that was how they got to México. The fir forests of the state of México and Michoacán came to represent the parents who waited for them with open arms.

Source:

Las Mariposas entre los Antiguos Mexicanos by Carlos R. Beutelspacher.

Mariposas Mexicanas by Roberto de la Maza.

Magazine *Muy Interesante* (Special edition of Ecology)

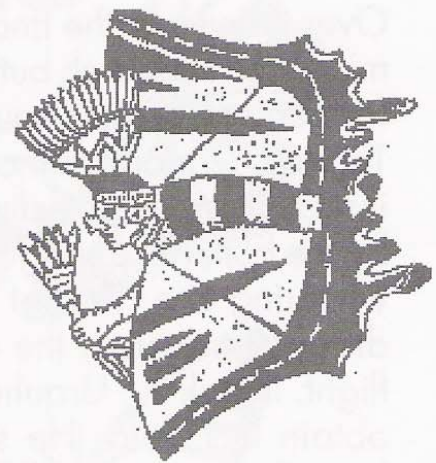
ACTIVITIES

1. Ask your students to research in the public library how butterflies were used in pre-hispanic cultures or use the background information for this activity. Make a list on the board of all the ways butterflies were used in pre-hispanic culture, for example: on ceremonial altars to burn aromatic plants and incense, as ornaments on nose rings, headdresses, etc., and, in architecture on murals, columns, etc., and any other uses such as religious, as myths or legends.

2. Discuss why the butterfly's figure was used. Because of its beauty and coloring? Because of a particular meaning? Let the students give their opinions freely.

3. Subsequently, the students should research how the butterfly's figure is used today and particularly, that of the Monarch Butterfly. Have the students bring objects from home in which the butterfly's figure is represented. Classify the objects by usage. Discuss if the uses have changed and how.

4. Use the attached sheet which has the designs of the pre-hispanic butterfly to make crafts. For example, use them to create a fabric stamped with its design, an embroidery, a wood engraving, other wooden articles, cards, etc. Set up an exhibit with the objects created.



Xochiquetzal

ADDITIONAL ACTIVITIES

1. Ask the students if they know any myths or legends about butterflies. Ask them to tell the story to their classmates and discuss the possible origin of that myth or legend. If the subject of "the butterfly of death or bad luck" is discussed, make it clear that these are superstitions and that no butterfly can be a carrier of sickness or a messenger of death.

2. Write a story or legend about the migration of the Monarch Butterfly. Select the best and send them to PROFAUNA A.C. for publication in the next report.

MAKING DECISIONS IN THE FOREST

OVERVIEW

There are no easy solutions to the problems which emerge in protecting natural areas. Solving them requires that the parties affected participate and compromise in the decisions made. The students will analyze the problems that the MONARCH BUTTERFLY SPECIAL BIOSPHERE RESERVE in Mexico faces, and will propose solutions.

BACKGROUND

Over the years, the final destination of the great majority of migrating Monarch butterfly's was a true mystery, especially for zoologist Fred Urquhart, a professor at the University of Toronto, Canada. Since 1937, he has studied this singular insect. His main objective was to determine the route followed by the butterfly during its migration and the Monarch's overwintering site. To that end, it was necessary to know the distance traveled, the direction and the destination of the flight. It took Dr. Urquhart a long time to figure out a way to obtain this data. He solved the problem by marking the butterflies with a small adhesive tag, which he designed. The tag was affixed by gently applying pressure to the butterfly's wing, and did not affect its flying capability. It is important to note the effort involved in capturing these delicate insects, and subsequently, releasing them without any harm.

In 1952, the first marking of the Monarchs was completed. The tags had an identification number and the inscription "send to Zoology Dept., University of Toronto, Canada". With the collaboration of numerous residents from Canada and United States, it was determined that the butterflies flew on a diagonal route, crossing the US from the northeast to

LEVELS

Grades 5–12

SUBJECTS

Primary: Social Studies, Natural Sciences and Language Arts.

Middle School: Social Studies, Language Arts, Journalism

High School: Socioeconomic Problems, Reading and Writing Workshop

CONCEPTS

- Forests, as well as other ecosystems, contain numerous habitats that support diverse populations of organisms.
- Human societies and cultures throughout the world interact with each other and affect the natural systems upon which they depend.
- In democratic societies citizens have a voice in shaping resource and environmental management policies. They also share in the responsibility of conserving resources and behaving in an environmentally responsible manner.

SKILLS

Analysis, Synthesis, Oral and Written Communication, Information Gathering, Planning, Teamwork, Critical Thinking, Problem Solving.

OBJECTIVES

The students will analyze the problem areas concerning the care of Monarch sanctuaries and will propose alternative solutions..

MATERIAL

Set of cards explaining dilemmas, writing paper to write proposals.

TIME REQUIRED

Preparation: As needed.
Activity: 45 minutes

the southeast. It was observed that large groups of butterflies crossed Texas apparently in route to Mexico.

In 1972 several Mexican newspapers published an announcement, asking for volunteers to locate the hibernation sites. A Mexican-American couple, living in Mexico, solved the enigma. Based on the information from some woodcutters of a small town called Angangueo, they located the first colony in a fir forest (oyamel) in the Michoacán mountains, in 1975.

Dr. Urquhart was notified and visited the site in 1976. He was there for several days, marking butterflies. Some of these marked samples were found north of Texas, in April of the same year. In this way, the migratory route of the Monarch Butterfly was established. But, new questions arose. Why did they choose this area? What characteristics make it special?

Located in the high mountains of the neovolcanic axis of México, this temperate forest is humid with an abundance of pines, firs and cedars. The great number of trees ensures that the temperature and humidity remain steady in the forest, creating the essential conditions for the Monarch's survival.

At the end of autumn, when the Monarch Butterflies arrive at their sanctuaries, they form groups which roam the higher mountain elevations, changing places every night. As winter advances and the temperature goes down, these lepidoptera move to the lower elevations until they find the right altitude, where the temperature and humidity stay at the required level for hibernation. By mid December, they gather, forming large and dense clusters that hang from the trees and, transform the landscape into a handsome tapestry of orange tones. There they remain in hibernation until mid February.

The importance of this forest is that the trees are not only useful to support the butterflies' colonies, but they also provide the ideal micro-climate for hibernation (from 6 to 15° C) as a result of the forest's density. In these forest conditions, the butterflies avoid extreme cold temperatures which would

freeze them to death, and high temperatures which would trigger their activity, forcing them to burn the fat stored for mating and returning north in the spring.

Although variations in temperature could be accounted for by natural causes, they are, as a rule, the result of deforestation. Mortality studies on Monarchs indicate that when tree density is less than 400 trees per hectare, the internal temperature surpasses the critical threshold for the butterflies' survival, freezing hundreds of thousands of butterflies to death.

To avoid this situation and protect the Monarch butterfly's overwintering sites, on October 9, 1986, a Presidential Decree was issued. It declared 16,110 hectares of woodland a Natural Protected Area, classifying it as a Special Biosphere Reserve and turning six nucleus zones into sanctuaries where no exploitation of any kind is allowed. These zones include the following areas: the Cerro Altamirano and the Cerro Pelon in the state of México; and the Sierra El Campanario, the Sierra Chincua, the Cerro Chivati and the Cerro Huacal in the state of Michoacán, each surrounded by a buffer zone or area where harvesting of trees and tourism are permitted but on a limited basis.

A large area of the reserve is occupied by farming communities called "ejidos" where living conditions are poor, particularly in health, education, communication, housing and drinking water. For many years, lumbering has been their principal means of livelihood with agriculture, cattle raising and mining as secondary economic activities.

However, economic need has led the inhabitants of this region to overexploit their natural resources. Deforestation caused by excessive felling of trees, whether for the timber industry, for farming, or for cattle raising, has contributed to the destruction of the forest's natural vegetation and, as consequence, to the impoverishment of the inhabitants and the deterioration of the Monarchs' overwintering sites. In the opinion of many researchers, the real danger which threatens the butterflies are these changes in land use.

In an attempt to halt the deforestation caused by the local inhabitants, who are pressed by economic need, various projects have been initiated over the last few years, including an ecotourism project which opened one of the sanctuaries to the public. In theory, the profit made was to be divided among the local residents. The neighboring communities also were to benefit from the tourism, by making food, lodging and transportation available, and by selling their crafts.

However, the local participants in the project complained that their per capita income was still too low and that it did not meet their needs. As a result, the felling of trees continues at an alarming rate.

To further complicate matters, the behavior of tourists exacerbates the problem. Many do not obey the rules established to protect the Monarchs in their sanctuary. They smoke, their noise disrupts the butterflies' peaceful hibernation, they disturb the butterflies by shaking the branches where the butterflies cluster, and even catch the butterflies for their personal collections. They litter a great deal, and start bonfires which in some cases have resulted in larger fires, another factor contributing to the destruction of the Monarch Butterfly's habitat. Many conservation groups have voiced their concern because of the high rate of fires in the reserve. Some have suggested closing the sites to tourists.

Under these circumstances it is necessary for the people of these communities to find new, alternate ways of sustainable development. The Mexican Government, the U.S. Fish & Wildlife Service and some non-governmental organizations are helping the communities diversify their activities. In addition to tourism, local communities have been encouraged to become involved in soil conservation, horticulture, fruit growing, fish breeding, carpentry, and reforestation to improve the quality of life without affecting the forests they inhabit. As with every official project aiming at helping the communities, this one has faced difficulties; mainly, because it is not simple to change the peasants' customs and practices. It is also not easy to eliminate the corruption that prevails at all levels.



On the other hand, until the peasants benefit economically in a significant way, and become environmentally conscious of their relationship to nature, the pines, firs, and cedars will continue to be harvested indiscriminately. It is also evident that in order to protect the Monarch Butterfly and other species, it is not enough to declare a zone a "protected area." It is essential to consider the needs of the human groups that live in or near the area.

Mexicans face the challenge and the responsibility to ensure that each citizen is able to satisfy his or her most basic needs. Only then will we be able to guarantee not only the protection of the Monarch Butterfly, but also the protection of other species that inhabit our country.

ACTIVITIES

1. Discuss the following dilemma with your students:

The overwintering sites of the Monarch Butterfly are located in 16,110 hectares of temperate and humid forest with a predominance of pines and Douglas fir. The area includes the municipalities (similar to the US counties) of Ocampo, Angangueo, Zitacuaro, Hidalgo and Contepec in the state of Michoacan and Donato Guerra, Villa de Allende, and Temascalcingo in the State of Mexico.

Many communities are located in the Reserve. The living conditions are extremely poor in the majority of them. The people mostly practice subsistence agriculture but some raise cattle as well. They only plant corn and beans needed for family use. But, in order to farm, they must cut down the trees. And, because the forest soil is quickly depleted of its low level of nutrients (3-4 years), they frequently clear new land for cultivation. In order for the animals to graze, the people frequently burn the dry and tough grass to allow the growth of green and tender grass. But sometimes the fire gets out of control, causing forest fires. At the same time, the indiscriminate pasturing of the animals destroys the new trees, making it difficult for the forest to recover. The people in the community also supplement their small incomes by commer-

cial harvesting of trees, either on their own or as employees of lumber dealers.

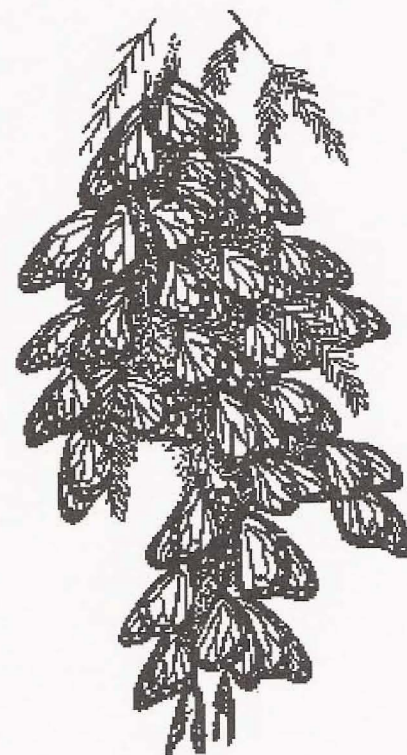
Agriculture, cattle raising, the harvesting of trees, and other factors such as fires, and plant diseases and pests combined contribute to the destruction of the Monarch's winter habitat and could put the species' survival at risk. This situation worries several conservation groups who demand an end to the harvesting of trees, attempt to regulate agricultural and cattle raising practices and try to prohibit tourists from entering the sanctuary, because the visitors do not obey the rules.

The communities oppose those measures. Meanwhile, entrepreneurs and lumber dealers put pressure on the Government to get permits for tree harvesting, claiming to contribute to the creation of new jobs and profits for the region. Governmental organizations in charge of the Reserve, face a big dilemma because they know that if they stop the clearing and harvesting of trees and tourism, the economic problems would get worse, not only in El Rosario, but in the entire region as well.

The situation is critical because all groups wish to impose their view. The Mexican Government must decide what is best for the butterfly, the community members, and the region. To that end, the Government has gathered all the people interested and each group may present their point of view and possible solutions to the problem.

2. Ask the group to select six students to play the role of Government authorities (such as the U.S. Forest Service or the U.S. Fish & Wildlife Service) and a representative of the different mayors of the region. They will represent the Board of Directors, whose functions will be to listen to the groups, analyze the proposals, make a decision, and communicate it to the others.

3. Depending on the group size, divide the students into teams to represent: community members of El Rosario, neighboring communities, a Conservation Group, lumber dealers



and public opinion. Once each team has chosen their role, they must prepare their presentation. Each group will have five minutes to present and two to answer questions.

Also, name two reporters, one from the press and another from radio or TV. The reporters must cover the debate, conduct interviews, prepare a newspaper article, and a news program. You can play the moderator role, or assign a student to that role.

4. Once the debate is finished and the Board of Directors has given their verdict, ask the students to explain why they reached such a decision and if they consider it beneficial to the butterfly, the people from El Rosario, and the region in general. Otherwise, who does it benefit? What does the group think? Who is right?

Emphasize to your students that each group in the debate has a vested interest or reason for their view, and that to find a solution which satisfies everyone is almost impossible. It is not easy to solve the problems related to conservation. For that reason, it is necessary that each interested party compromise or yield to some of the demands made by opposing groups, even when their interests are affected.

5. Ask the students the following:

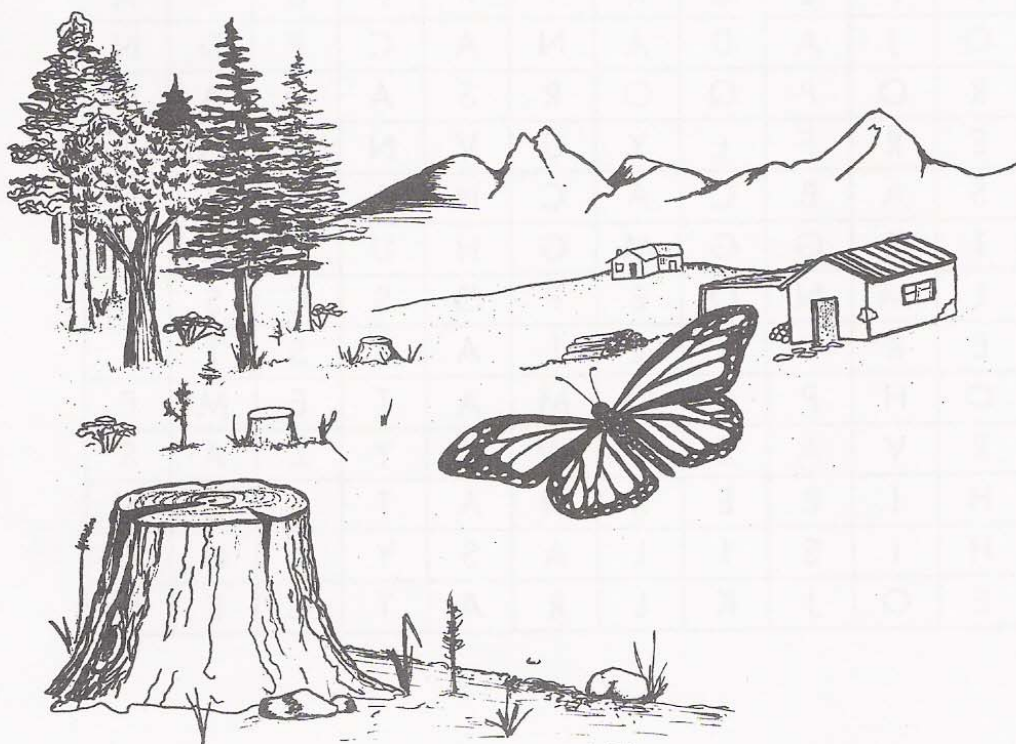
Do they think that there is any action they can take in their community that might help halt the cutting down of trees in the Monarch Butterfly Special Biosphere Reserve? Would decreasing their paper consumption have an effect? Yes or no? Why?

ADDITIONAL ACTIVITIES

1. Ask the students to investigate if there is a similar situation in their community that is affecting a particular species. If so, have them do the research and prepare their own presentation.

2. Write a letter to the Mexican Secretaria del Medio Ambiente, Recursos Naturales y Pesca (the Department of the Environment, Natural Resources and Fishing), to express your concern about the future of the overwintering sites. The address is:

SEMARNAP
Ave. Revolución # 1425
Col. Tlacopac, San Angel
Delegación A. Obregón
C.P. 01040
Mexico, D.F.



WORD FIND PUZZLE

Find the hidden words related to the Monarchs in the puzzle below. Extra letters are being used to camouflage them, so look closely and see how many words you can find. Be sure to look from right to left, left to right, top to bottom and bottom to top.

- | | |
|------------------|-----------------|
| 1. Butterfly | 11. Forest |
| 2. Monarch | 12. Hibernation |
| 3. Danaus | 13. Oyamel |
| 4. Metamorphosis | 14. Canada |
| 5. Egg | 15. Mexico |
| 6. Larvae | 16. Linneo |
| 7. Caterpillar | 17. Migration |
| 8. Chrysalis | 18. Nectar |
| 9. Pupa | 19. Plexippus |
| 10. Asclepias | 20. Sanctuaries |

S	W	I	M	O	N	A	R	C	H	N	R	V	N	I
A	B	C	I	C	H	A	S	C	L	E	P	I	A	S
D	E	F	G	F	P	L	E	X	I	P	P	U	S	A
G	H	I	R	O	J	A	D	A	N	A	C	P	D	N
L	M	N	A	R	O	P	Q	O	R	S	A	U	A	C
B	U	T	T	E	R	F	L	Y	U	V	N	P	N	T
X	Y	Z	I	S	A	B	C	A	C	H	A	A	A	U
M	E	F	O	T	E	G	G	M	G	H	U	O	U	A
E	J	K	N	L	M	N	O	E	P	Q	S	C	S	R
X	C	A	T	E	R	P	I	L	L	A	R	S	T	I
I	S	I	S	O	H	P	R	O	M	A	T	E	M	E
C	U	L	A	R	V	A	E	V	W	X	Y	Z	A	S
O	B	C	C	H	I	B	E	R	N	A	T	I	O	N
D	E	N	G	H	I	S	I	L	A	S	Y	R	H	C
L	I	N	N	E	O	J	K	L	R	A	T	C	E	N

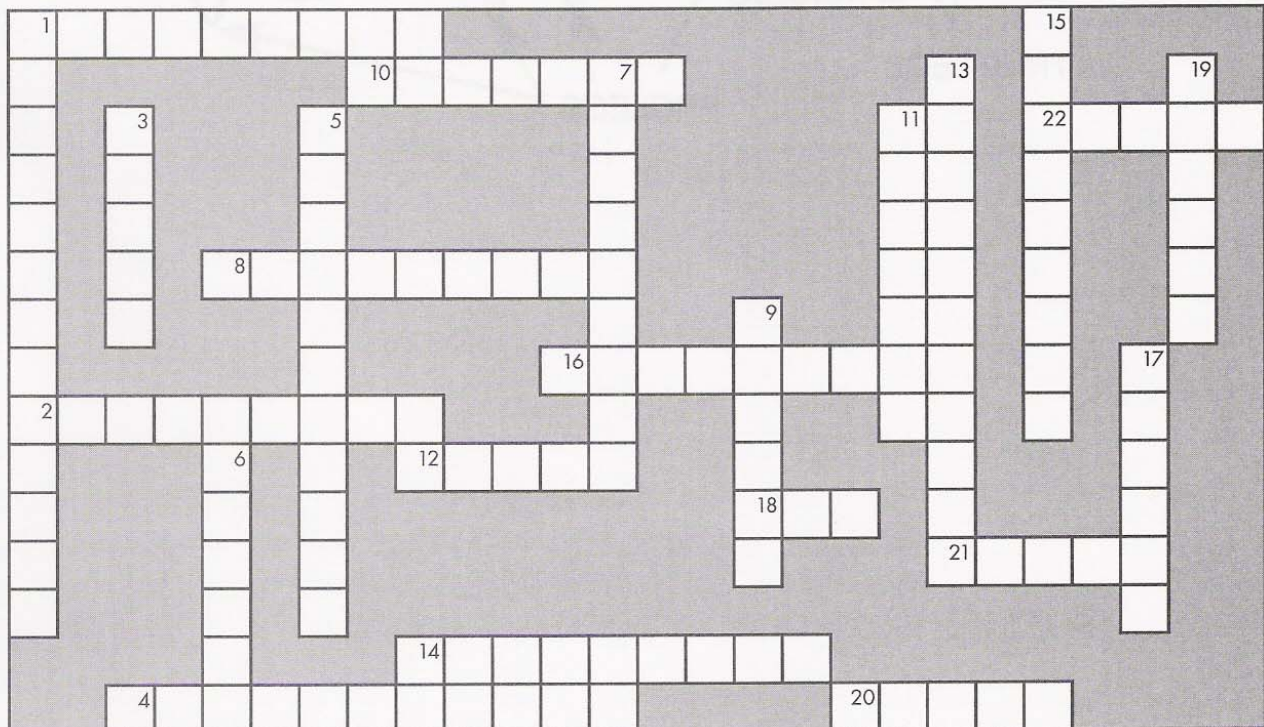
CROSSWORD PUZZLE

Across

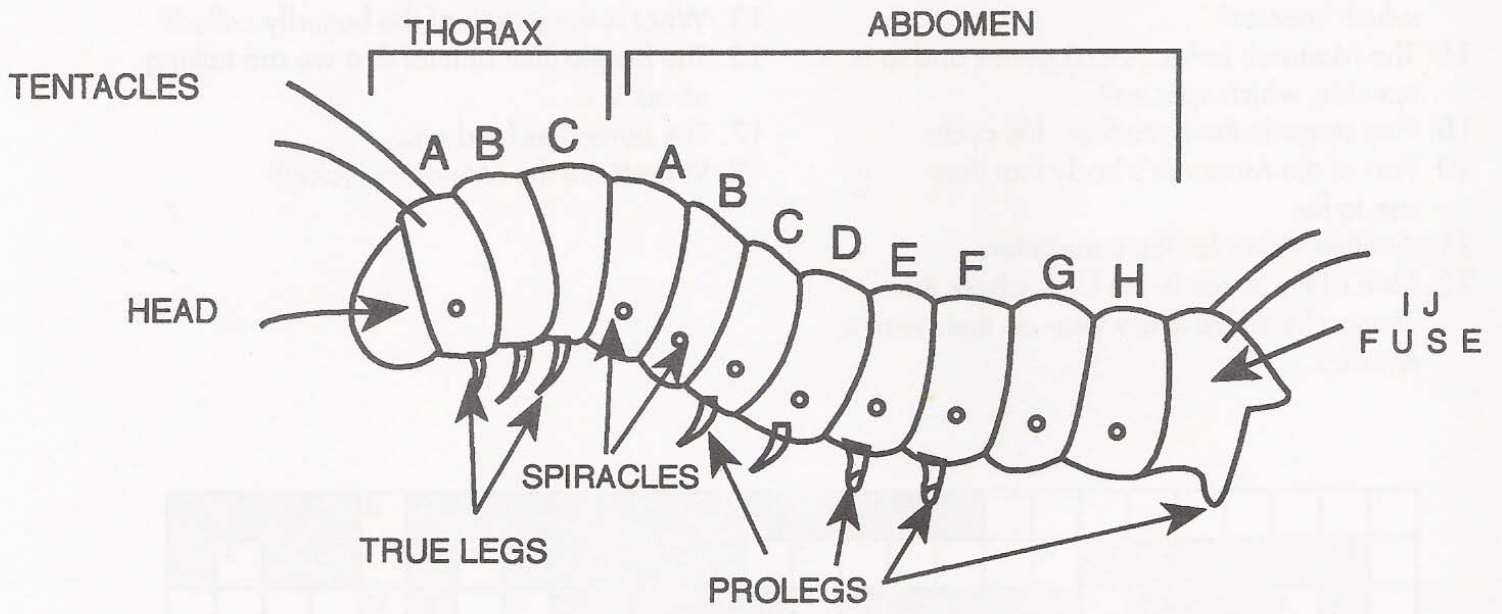
1. Journey that the Monarchs make every year.
2. What the Butterflies do in Mexico during the winter.
4. Second stage in the butterflies' life cycle.
6. Tree where the Monarchs settle to hibernate.
8. Plants where the Monarchs place their eggs.
10. Butterfly that hibernates in Mexico every year.
12. Genus of the Fir.
14. The Fir belongs to a genus and to a species, which species?
16. The Monarch belongs to a genus and to a species, which species?
18. First stage in the butterflies' life cycle.
20. Part of the Monarch's body that they use to fly.
21. Another name for the caterpillar.
22. One of the states in the USA where the Monarchs arrive every year on their way to Mexico.

Down

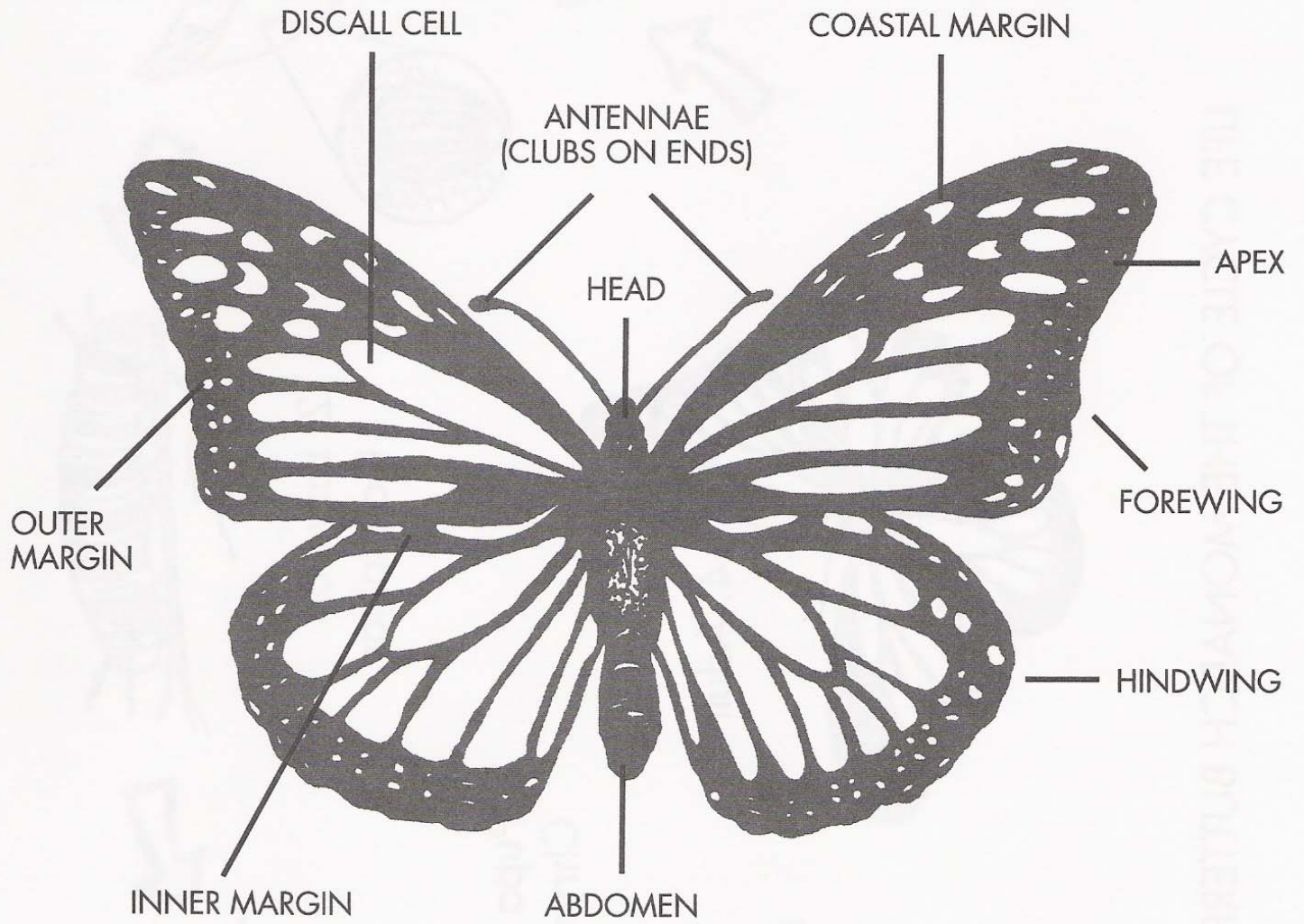
1. All the butterflies undergo a change called...
3. During the trip the butterflies rest and take refuge on the...
5. Places where millions of Monarchs arrive every year.
6. The Monarchs take refuge in the...
7. Another name for a butterfly pupa.
9. The last name of the naturalist who classified the Monarch in 1758.
11. Genus of the Monarch butterfly
13. What is the mouth of the butterfly called?
15. The fragile little animal that we are talking about is a...
17. The butterflies feed on...
19. Where are the Monarchs going?

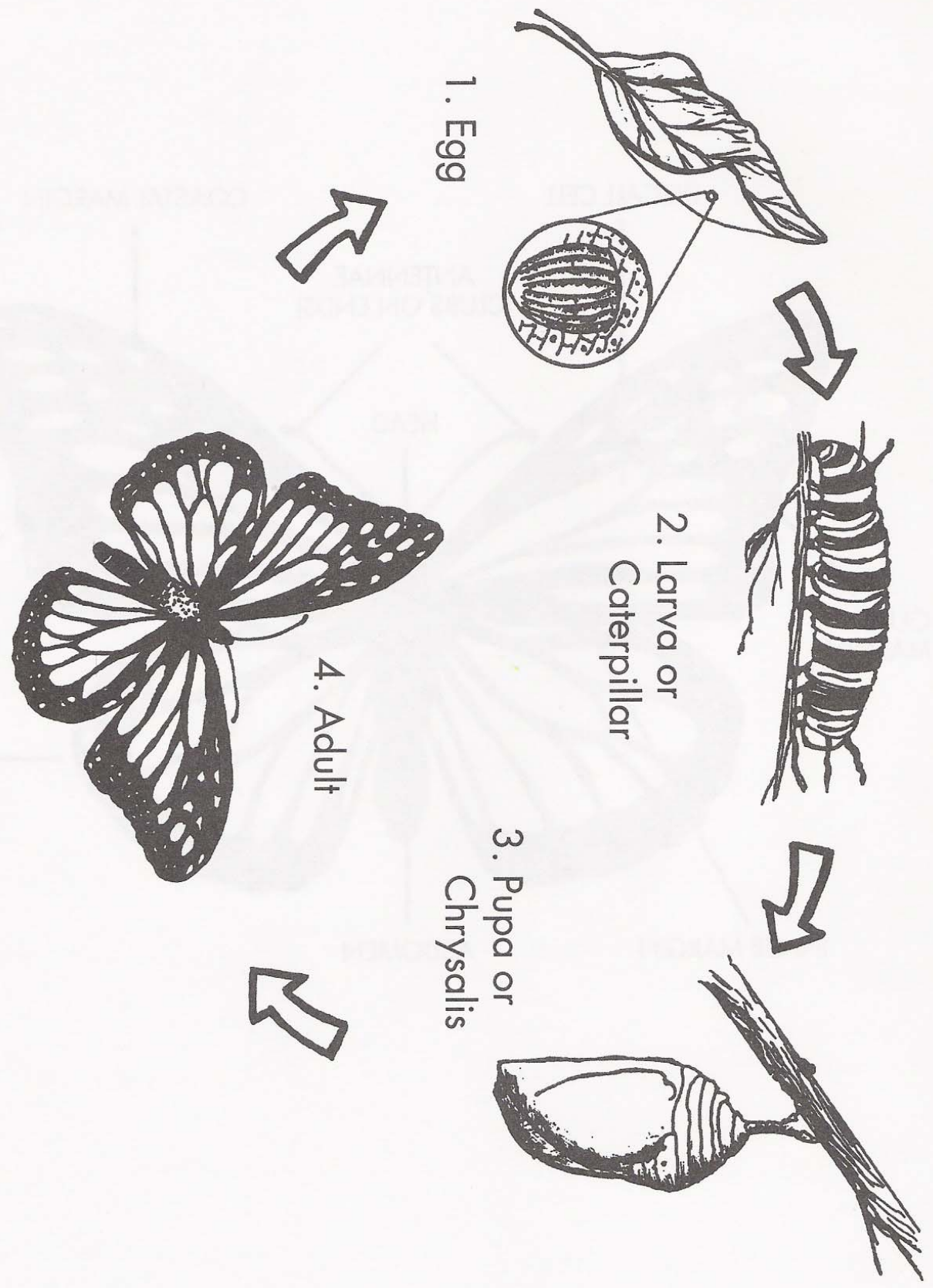


CATERPILLAR ANATOMY



BUTTERFLY ANATOMY





LIFE CYCLE OF THE MONARCH BUTTERFLY

THE BUTTERFLY TREE

Name _____

School _____ Grade _____

Teacher's Name _____

City _____ State _____

Observation Date _____ Time _____

1. How long did you observe the butterflies?

1 min. _____ 5 min. _____ 10 min. _____

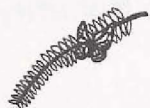
2. How many Monarch butterflies did you see during that period of time?



Flying _____



Drinking _____



Resting on a plant _____



Feeding _____

3. If they were resting on a plant, what kind of plant was it?



Tree



shrub



grass

4. What is the plant's name?

5. Look up the scientific name of the plant.

6. If they were resting on a tree, how tall was it?



6-15 ft



15-30 ft



more than 30 ft

7. Where did you observe the butterflies?

sidewalk _____ park _____ garden _____ country _____
other _____

8. Name and location of the park, street, neighborhood, road, etc. where you observed the butterflies.

9. What other plants were in the immediate surroundings?

10. At the time of observation, what was the weather like?



sunny



cloudy



cold



hot



windy



raining

Recommendations for better observation:

- You should watch in early morning or late afternoon.
- Be silent and walk slowly when you see the butterflies.
- Avoid projecting your shadow on the butterflies.
- Do not make sudden movements; they disrupt the butterflies very easily.

Dear friend:

The information that you collect will be of great help in knowing more about the Monarchs, making it possible to help them on their yearly migration. You may want to make copies of this form to send reports as often as you like.

EVALUATION AND COMMENTS

Please fill out this form and send it with "The Butterfly Tree" worksheet.
This information will help us improve this project.

Teacher's name _____

Grade _____ Classroom Size _____

City _____ State _____

1. The activities in this manual were:

Good _____ Average _____
Excellent _____ Were not used _____

2. Activities were integrated in the following subjects:

Language Arts Mathematics
Science Art Education
Geography History Biology
Ecology Others

If possible specify the topics or units discussed in relation to the activities.

3. Objectives met through the activities. (By subject)

4. Skills developed by your students by participating in this project.

5. Students were:

Interested _____ Not interested _____
in the activities.

6. Which activity worked better?
Which one did not work?

7. Did you make any changes in the activities?

8. The background information was:
Adequate _____ Inadequate _____

9. What other topics would you like to see discussed in the Monarch Butterfly Manual?

10. How would you evaluate your students' rate of learning or depth of knowledge about the Monarch Butterfly?

11. Describe any difficulties experienced in taking part in the project.

12. Do you receive the Correo Real reports?

13. Write any other comments you may have about this manual and project.

