



## Teaching Guide

For

**Butterfly  
Brigade**

**Illinois Problem Based  
Math and Science Project**

**2008**

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## Acknowledgements

*We would like to recognize the following people for their contribution to this module:*

Matt Sprenger and Ron Fisher, Chautauqua Wildlife Refuge

Tracy Trimpe Havana Junior High, Havana, IL

Dawn Hughes Havana Junior High, Havana, IL

## Problem Solving Activity

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## **Scenario Focus**

**Primary Career Pathway:** Natural Resources System in Agricultural, Food and Natural Resources Career Cluster

**Occupation/Job Titles Related to this Scenario:** Wildlife Managers, Ecologists, Park Managers, Environmental Interpreters

**Recommended Teaching Subject Areas:** Life Science, Ecology

## **Teacher/Writer Information**

Tracy Trimpe 309-543-6677 [ttrimpe@havana126.net](mailto:ttrimpe@havana126.net)

Dawn Hughes 309-543-6677 [dhughes@havana126.net](mailto:dhughes@havana126.net)

## **Business/Industry/Government Partner**

Chautauqua Wildlife Refuge

Matt Sprenger, Refuge Manager

19031 E CR 2110N, Havana, IL 62644

Phone: 309-535-2290

Website: <http://www.fws.gov/midwest/IllinoisRiver/chaq.html>

## **Scenario Problem Statement and Performance Elements**

The local board of the US Fish and Wildlife Service wants to increase the biodiversity of the butterfly population within Chautauqua Wildlife Refuge. Your task, as refuge manager, is to recommend a strategy to increase the diversity of the butterfly populations at this site.

## **Cluster Knowledge and Skills and Performance Elements**

- Monitor natural resource status to obtain planning data
- Employ environmental and wildlife knowledge to demonstrate natural resource enhancement techniques
- Communicate natural resource information to the general public
- Use science concepts, processes, and research techniques to examine natural resource topics
- Examine biological and physical characteristics to identify and classify natural resources
- Apply statistics, charts, and scatter grams to measure and monitor operations



## **Illinois Learning Standards:**

### **Science Standards (Middle School) (Level H)**

- 11.A.3a Formulate hypotheses that can be tested by collecting data.
- 11.A.3c Collect and record data accurately using consistent measuring and recording techniques and media.
- 11.A.3d Explain the existence of unexpected results in a data set.
- 11.A.3e Use data manipulation tools and quantitative (e.g., mean, mode, simple equations) and representational methods (e.g., simulations, image processing) to analyze measurements.
- 11.A.3f Interpret and represent results of analysis to produce findings.
- 11.A.3g Report and display the process and results of a scientific investigation.
- 12.B.3a Identify and classify biotic and abiotic factors in an environment that affect population density, habitat and placement of organisms in an energy pyramid.
- 12.B.3b Compare and assess features of organisms for their adaptive, competitive and survival potential (e.g., appendages, reproductive rates, camouflage, defensive structures).

### **Math (Level H)**

- 10A - Students who meet the standard can organize, describe and make predictions from existing data. (*Data Analysis*)
- 10B - Students who meet the standard can formulate questions, design data collection methods, gather and analyze data, and communicate findings. (*Data collection*)

<b>What I Want Students to Know</b>	<b>What I Want Students to be Able to Do</b>
<ul style="list-style-type: none"><li>• Field identification of butterflies</li><li>• Habitat requirements for butterflies</li><li>• Threats that butterfly populations face in local habitats</li><li>• Methods for conducting a field survey and collecting accurate, reliable data</li><li>• Career opportunities in Natural Resources Systems</li></ul>	<ul style="list-style-type: none"><li>• Develop a procedure to conduct a butterfly survey</li><li>• Utilize data collection methods that will result in reliable and accurate data</li><li>• Develop graphs and charts that best express the data collected</li><li>• Analyze collected data to determine the diversity of the butterfly populations</li><li>• Identify areas of concern within the butterfly community</li><li>• Recommend a strategy that will increase butterfly diversity</li><li>• Develop a presentation for refuge staff</li></ul>

## **Objectives:**

- Develop a procedure to conduct a butterfly survey
- Identify data collection methods that will result in accurate and reliable data.
- Conduct a field survey to document the diversity of the butterfly populations.
- Analyze collected data to determine the diversity status of the butterfly populations and identify areas of concern.
- Make a presentation to refuge staff that recommends a strategy that will have a positive effect on butterfly populations.

## **Measurement Criteria for an acceptable solution:**

1. Survey procedure was explained and included reasons for specific data controls that result in accurate and reliable data.
2. Presentation included analysis of data and explanation of unexpected data.
3. Areas of concern are included and explained.
4. Research was documented and relevant to project goals.
5. Proposed strategy demonstrated knowledge of areas of concerns and incorporates methods that increase diversity.
6. The presentation met the 7 requirements of effective business presentations:
  - a. Evidence of preparedness and practice
  - b. Started on time
  - c. Dressed appropriately
  - d. Showed enthusiasm and confidence
  - e. Maintained eye contact, showed friendliness and respect
  - f. Spoke slowly and distinctly without grammatical errors or slang
  - g. Welcomed questions and answered completely; accepted reactions without being defensive.

## **Teacher Notes:**

This module was developed for use with 8<sup>th</sup> grade students. The majority of the lessons are designed for the science classroom with the data analysis lesson completed in the math classroom. If a partnership between a math and science teacher is not possible, the module may be completed entirely in a science classroom.

Students will need to have prior experience with identifying common Illinois butterflies. You may choose to limit your survey to a few easy-to-identify species in

order to expedite the survey process and reduce possible errors in data collection. An introductory PowerPoint presentation, field guide cards, and flash cards have been provided to help your students learn how to identify the 25 species listed on the Illinois Butterfly Monitoring Network Beginner's List as well as a few from the intermediate category.

NOTE: It is not required that every student is able to identify every butterfly. Rather they should be able to work together as a group and use the field guide to identify the butterflies they see at the refuge.

To encourage all students to participate in the butterfly survey, you may want to assign specific roles for each team member. Possible roles might include:

- Main Identifiers (1-2 students) - Responsible for initial identification of observed butterflies
- Support Identifiers (1-2 students) - Responsible for assisting the main identifiers in identifying an unknown species or identifying a butterfly that was missed by the main identifiers
- Data Recorders (1-2 students) - Responsible for recording all observed butterflies
- Map Manager (1 student) - Responsible for keeping the team in the correct survey area
- Photographer (1 student) - Responsible for taking photographs of the survey area and/or observed butterflies

**Time Required to Complete Problem:** 12 hours

### **Types of Materials included in this Module:**

1. Lesson plans for each topic with discussion questions and student activities.
2. Copy of student handouts with activities for duplication.
3. Evaluation with measurement criteria and scoring guide.
5. Teacher materials to assist in evaluation of problem and possible solution steps.
6. Glossary of terms related to this module.
7. Helpful Resources listed in Appendix B
8. 3 pdf files that have materials for Lessons 3 and 4.
  - ButterflyFieldGuide.pdf
  - ButterflyFlashCards.pdf
  - Butterfly Survey Form.pdf
9. A PowerPoint Presentation: ButterflyGuide.ppt

## **Support Materials and Resources Necessary for Completion of Scenario:**

- Computer access to internet
- Presentation software and equipment
- Area for butterfly survey (park, schoolyard, refuge, etc.)
- Insect nets (optional)
- Handouts (see each lesson)
- Websites (see each lesson)
- Printed Resources (See Appendix B)
- Pdf files that accompany the module that have materials for specific lessons
- PowerPoint Presentation

# Lesson 1

<b>TOPIC</b>	Biodiversity Basics	<b>TIME ESTIMATE</b>	45 minutes
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<b>OBJECTIVES</b>	
<ul style="list-style-type: none"> <li>• Students will be able to define biodiversity.</li> <li>• Students will be able to describe the three types of biodiversity.</li> <li>• Students will be able to identify the three types of habitats found in Illinois.</li> <li>• Students will be able to describe conservation issues related to biodiversity.</li> </ul>	

<b>MATERIALS &amp; RESOURCES</b>	
<ul style="list-style-type: none"> <li>• Handout #1, Biodiversity Basic Discussion Guide</li> <li>• Biodiversity of Illinois DVD (Available from the Illinois Department of Natural Resources)</li> <li>• Biodiversity of Illinois video guide (Available online -see Appendix B)</li> </ul>	

<b>LESSON DESCRIPTION &amp; ACTIVITIES</b>		
<b>Steps</b>	<b>No. of Minutes</b>	<b>ACTIVITIES</b>
1	10	<ul style="list-style-type: none"> <li>- Distribute copies of Handout 1, Biodiversity Basics Discussion Guide.</li> <li>- Allow time for students to complete what they can on the discussion guide (The teacher should monitor students during this time in order to gauge their prior knowledge of the topic.)</li> </ul>
2	20	<ul style="list-style-type: none"> <li>- Watch the Biodiversity of Illinois video</li> <li>- Instruct students to correct and/or fill in answers on the discussion guide as they watch the video</li> </ul>
3	15	<ul style="list-style-type: none"> <li>- Discuss the questions on the video worksheet as well as additional questions students may have about the topics in the video</li> </ul>





Name \_\_\_\_\_

**Complete this worksheet as you watch the Biodiversity of Illinois video.**

1. What is biodiversity? \_\_\_\_\_

2. What are the different types of biodiversity?

\_\_\_\_\_ diversity includes all the different types of living things.

\_\_\_\_\_ diversity includes the variety of differences within species, which is determined by the genes on chromosomes.

\_\_\_\_\_ diversity refers to the variety of habitats.

3. How many natural divisions are in Illinois? \_\_\_\_\_

Which one includes our area? \_\_\_\_\_

4. What are the three habitat types found in Illinois? \_\_\_\_\_

5. What happens to organisms when a habitat is destroyed? They are \_\_\_\_\_, must \_\_\_\_\_, or must \_\_\_\_\_ to different habitats.

6. What are the main threats to Illinois habitats? Habitat \_\_\_\_\_, introduced \_\_\_\_\_, pollution, population \_\_\_\_\_, and over consumption.

7. What is the natural rate of extinction? \_\_\_\_\_ species every \_\_\_\_\_ years

8. What is the rate of extinction today? \_\_\_\_\_ species every \_\_\_\_\_

9. What can we do to improve biodiversity?

## Lesson 2

<b>TOPIC</b>	Butterfly Problem	<b>TIME ESTIMATE</b>	90 minutes
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<b>OBJECTIVES</b>	
<ul style="list-style-type: none"> <li>• Students will be able to develop a method for conducting a survey to determine the biodiversity of a butterfly community.</li> <li>• Students will be able to incorporate methods for collecting accurate and reliable data.</li> </ul>	

<b>MATERIALS &amp; RESOURCES</b>	
<ul style="list-style-type: none"> <li>• Handout #2, "Butterfly Brigade worksheet "</li> <li>• Chalkboard or overhead projector</li> </ul>	

<b>LESSON DESCRIPTION &amp; ACTIVITIES</b>		
<b>Steps</b>	<b>No. of Minutes</b>	<b>ACTIVITIES</b>
1	20	<ul style="list-style-type: none"> <li>- Pass out Handout 2, Butterfly Brigade Worksheet and introduce the problem statement</li> <li>- Allow time for students to work in small groups to complete the "What do you know?" &amp; "What do you need to know sections?"</li> </ul>
2	15	<ul style="list-style-type: none"> <li>- Discuss student responses to the "know/need to know" sections</li> <li>- Allow time for teams to discuss the remaining questions on the worksheet</li> </ul>
3	10	<ul style="list-style-type: none"> <li>- Facilitate a group discussion by allowing groups to share their ideas for completing the task and recording responses on the chalkboard or other display (overhead projector, SmartBoard, etc.)</li> </ul>
4	15	<ul style="list-style-type: none"> <li>- Allow time for the student teams to discuss ideas for conducting a butterfly survey and have them record their ideas on the back of the worksheet</li> </ul>

5	20	<ul style="list-style-type: none"><li>- Facilitate a group discussion to discuss methods for conducting a butterfly survey and collecting accurate, reliable data</li><li>- Record their ideas on the chalkboard or other display to create a survey method</li></ul>
6	10	<ul style="list-style-type: none"><li>- Discuss the final survey and questions students may have</li></ul>



## Butterfly Problem

Team Members: \_\_\_\_\_

*The local board of the US Fish and Wildlife Service wants to increase the biodiversity of the butterfly population within Chautauqua Wildlife Refuge. Your task, as refuge manager, is to recommend a strategy to increase the diversity of the butterfly populations at this site.*

What do you know?	What do you need to know?

What will your team need to do to complete this task?

What materials will your team need to complete this task?

*Use this back of this page to record ideas that are discussed in class.*

## Lesson 3

<b>TOPIC</b>	Name That Butterfly	<b>TIME ESTIMATE</b>	135 minutes
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### OBJECTIVES

- Students will be able to identify common Illinois butterflies.

### MATERIALS & RESOURCES

- Computer and projector or TV
- Butterfly Brigade: Butterfly Boot Camp (See file ButterflyGuide.ppt)
- Butterfly Brigade: Field Guide cards - 1 set per group (See file Butterfly FieldGuide.pdf)
- Name That Butterfly flash cards - 1 set per group (see file ButterflyFlashcards.pdf )

### LESSON DESCRIPTION & ACTIVITIES

Steps	No. of Minutes	ACTIVITIES
1	45	<ul style="list-style-type: none"> <li>- Pass out <i>Field Guide</i> cards - 1 set for each small group</li> <li>- Show the <i>Butterfly Boot Camp</i> presentation to the students and help them identify specific markings/characteristics that could be used to help them identify the butterflies in the field</li> </ul>
2	35	<ul style="list-style-type: none"> <li>- Allow time for students to work in small groups to practice identification using the <i>Name That Butterfly</i> flash cards</li> </ul>
3	10	<ul style="list-style-type: none"> <li>- Discuss the activity and any questions the students may have</li> </ul>
	5	<ul style="list-style-type: none"> <li>- Review the survey method the students developed in Lesson 2 and field data collection form.</li> </ul>
5	30	<ul style="list-style-type: none"> <li>- If available, take students to the schoolyard or other local nature area to practice field identification</li> <li>- NOTE: If an area is not available, you may want to modify the Boot Camp presentation to give the students an opportunity to practice butterfly identification.</li> </ul>
6	10	<ul style="list-style-type: none"> <li>- Discuss safety concerns (suggestions listed below) for the field trip (proper clothing, insect stings/bites, poison ivy, dangerous locations and/or animals, rules for field trip location.)</li> </ul>

NOTE: It is not required that every student is able to identify every butterfly. Rather they should be able to work together as a group to identify the butterflies they see.

**Safety Concerns:**

- Students should wear appropriate clothing (long pants) and shoes. No open toe or open heel shoes allowed.
- Students should be aware of poisonous plants and/or animals they might encounter and know what to do in case anyone comes in contact with them.
- A first aid kit should be available in case of an accident. If anyone is allergic to bee stings, be sure to take a kit with you.
- Students may want to bring water bottles with them.
- Review the survey location and discuss the rules of the refuge (stay on trails; take nothing, leave nothing; show respect for other visitors.)
- You may want chaperones to have cell phones in case you need to contact them or they need help for any reason.

## Lesson 4

<b>TOPIC</b>	Butterfly Survey Field Trip	<b>TIME ESTIMATE</b>	60 minutes
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<b>OBJECTIVES</b>
<ul style="list-style-type: none"> <li>Students will be able to conduct a survey to determine the diversity of the butterfly community at the refuge.</li> </ul>

<b>MATERIALS &amp; RESOURCES</b>
<ul style="list-style-type: none"> <li>Clipboard with copies of the field reporting form, location information (maps, safety concerns, etc.) and the Butterfly Field Guide (PDF file used in Lesson 3)</li> <li>Copies of Butterfly Brigade Survey Form in pdf file with module</li> <li>Binoculars for each student team</li> <li>Digital cameras for each student team (optional)</li> <li>Insect Nets (optional)</li> </ul> <p>NOTE: Some locations will not allow netting of butterflies. Be sure to ask permission before doing any netting or collecting for identification purposes. Any specimens that are captured during the survey should be released within a short time.</p>

<b>LESSON DESCRIPTION &amp; ACTIVITIES</b>		
<b>Steps</b>	<b>No. of Minutes</b>	<b>ACTIVITIES</b>
1	10	<ul style="list-style-type: none"> <li>Pass out the materials for each group (clipboards, maps, field guides, survey form) and review the survey areas on the map</li> <li>Assign chaperones for each group</li> </ul>
2	40	<ul style="list-style-type: none"> <li>Allow time for students to report to their survey areas</li> <li>Students should spend at least 30 minutes recording the butterflies they see on their field data collection form</li> </ul>
3	10	<ul style="list-style-type: none"> <li>Discuss the results and questions students may have</li> </ul>

## Lesson 5

<b>TOPIC</b>	Analysis & Research	<b>TIME ESTIMATE</b>	90 minutes
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### OBJECTIVES

- Students will be able to analyze the collected data to determine the diversity of the butterfly community.
- Students will be able to identify areas of concern regarding the butterfly community.
- Students will be able to recommend a strategy to improve butterfly diversity.

### MATERIALS & RESOURCES

- Handout #3, "Data Analysis"
- Copies of the completed field reporting forms for each team
- Copies of blank field reporting forms for each team

### LESSON DESCRIPTION & ACTIVITIES

Steps	No. of Minutes	ACTIVITIES
1	25	<ul style="list-style-type: none"> <li>- Provide copies of the completed data sheets the students did on the field trip and provide a blank copy to be used to compile the data.</li> <li>- Allow time for students to compile the data from the completed data sheets.</li> <li>- Distribute Handout 3, Data Analysis.</li> </ul>
2	40	<ul style="list-style-type: none"> <li>- Allow time for students to complete Handout 3, Data Analysis where they analyze the data to determine the diversity of the butterfly community and identify areas of concern.</li> <li>- Students may need to use Internet sites and printed resources to help them complete the worksheet.</li> </ul>
3	25	<ul style="list-style-type: none"> <li>- Discuss the student responses to the analysis questions.</li> </ul>





## *Data Analysis*

Team Members: \_\_\_\_\_

Directions: Compile the collected data and record the information on a new data sheet. Use the compiled data to answer the questions.

1. Which three butterfly species were most common?
2. Which three butterfly species were least common?
3. Which butterfly species listed on the data form were not observed at all?
4. How does the data compare between the teams at the same location, i.e. 1A vs 2A?
5. How does the data compare between the teams at the different locations, i.e. 1A, 1B, 1C?
6. What are some possible reasons for differences in the data sets?

7. Is there data that does not seem to fit with the other collected data?

8. What are some reasons for the unexpected data?

9. What are some areas of concern with regards to the diversity of the butterfly population?

10. What will you need to know and/or do to solve the problem?

## Lesson 6

<b>TOPIC</b>	Presentation	<b>TIME ESTIMATE</b>	125 minutes
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### OBJECTIVES

- Students will be able to develop a presentation that summarizes their analysis of the collected data, outlines areas of concern, communicates information gathered during research, and recommends a strategy to improve butterfly diversity

### MATERIALS & RESOURCES

- Handout #4 "Rubric for Evaluating Student Presentation"
- Computers with Internet access
- Presentation software and equipment (projector & computer)

### LESSON DESCRIPTION & ACTIVITIES

Steps	No. of Minutes	ACTIVITIES
1	5	- Review the problem to be solved and discuss any questions students may have.
2	10	- Distribute Handout 4, Rubric for Evaluating Student Presentation. - Discuss and answer any questions that students may have.
3	80	- Allow time for students to develop their presentations.
4	30	- Have students make presentations to the class. - Discuss the things students learned while working on the presentation.



## Final Presentation Rubric

Team Members \_\_\_\_\_

CATEGORY	Excellent (4)	Good (3)	Fair (2)	Needs Improvement (1)	Poor (0)
<b>Survey Procedure</b>	Survey procedure is fully explained and controls for accurate and reliable data are included	Survey procedures explained and some data controls data are included	Survey procedure explained, but is lacking main steps; some data controls are included	Survey procedure and data controls are included, but not accurate or fully explained	Survey procedure and data controls are not included
<b>Data Analysis</b>	Complete analysis of data and full explanations for unexpected data has been included	Good analysis of data and partial explanations for unexpected data has been included	Fair analysis of data, but lacks explanations for unexpected data is minimal	Data analysis is minimal and not completed	Data analysis is not completed
<b>Areas of Concern</b>	Several areas of concerns are included and explained	A few areas of concern are included and explained	One area of concern is included and explained	An area of concern are included, but not explained	Areas of concern are not included
<b>Research</b>	Research is documented and relevant to project goals	Some research is documented and relevant to project goals	Documentation of research is minimal and shows little relevance to project goals	Results of research is minimal and shows no relevance to project goals	Results of research is not included
<b>Proposed Strategy</b>	Proposed strategy demonstrates a full knowledge of areas of concerns and incorporates methods that will increase diversity	Proposed strategy demonstrates a good knowledge of areas of concern and incorporates limited methods that will increase diversity	Proposed strategy shows little knowledge of areas of concern or does not address them; methods to increase diversity are not developed	Proposed strategy is not developed and knowledge of areas of concern are not able to be evaluated	No strategy is proposed

**Comments:**

# **Teacher**

## **Assessment Materials**

# FINAL EVALUATION

## **Problem Statement to be Solved:**

The local board of the US Fish and Wildlife Service wants to increase the biodiversity of the butterfly population within Chautauqua Wildlife Refuge. Your task, as refuge manager, is to recommend a strategy to increase the diversity of the butterfly populations at this site. You are to develop a presentation that will provide data to support your recommendation.

## **Measurement Criteria that would describe an acceptable solution**

1. Survey procedure was explained and included reasons for specific data controls that result in accurate and reliable data.
2. Presentation included analysis of data and explanation of unexpected data.
3. Areas of concern are included and explained.
4. Research was documented and relevant to project goals.
5. Proposed strategy demonstrated knowledge of areas of concerns and incorporates methods that increase diversity.
6. The presentation met the 7 requirements of effective business presentations:
  - A. Evidence of preparedness and practice
  - B. Started on time
  - C. Dressed appropriately
  - D. Showed enthusiasm and confidence
  - E. Maintained eye contact, showed friendliness and respect
  - F. Spoke slowly and distinctly without grammatical errors or slang
  - G. Welcomed questions and answered completely; accepted reactions without being defensive.

## **Suggested Scoring Guide**

1. Solving the Problem—75 points
  
2. Presentation--25 points

## Solution Checker

### Acceptable Examples for Survey Procedure:

- Students will be able to list the steps they will take to document observations as they conduct the survey
- Students will be able to explain the use of data controls.
  - Limiting the identification responsibilities to one or two students to prevent extra counting of butterflies observed.
  - Recommending the use of 1 person as data recorder to prevent omissions or duplications in the counting of butterflies observed.
  - Procedures for identification that require positive identification of a species rather than a guess.

NOTE: If a positive identification is not possible, butterflies may be recorded as an unknown species, such as "unknown skipper" or "unknown swallowtail."

### Acceptable Examples for Recommended Strategy:

- Recommend prescribed burns to encourage the growth of specific plants in an area of the refuge to increase host plants and/or nectar sources.
- Recommend the addition of specific plants that will provide host plants to encourage a greater diversity of butterflies.
- Recommend the addition of specific plants that will provide nectar sources for adults to attract a greater diversity of butterflies.
- Recommend the protection of specific areas of the refuge to limit human impact on the habitat areas and possible destruction of host plants, nectar sources, or butterflies.
- Recommend an educational campaign for communities near the refuge to encourage residents to develop new natural spaces or enhance existing areas to target a greater diversity of butterflies.

### Final Presentation:

Student teams should be able to work together to research the questions they developed during the data analysis portion of the activity and formulate a strategy that would result in an increase in butterfly diversity. A rubric for the evaluation of the final presentation has been provided on the following page. If you wish to evaluate the students on their presentation skills, there are numerous rubrics available for doing this or you can modify the rubric provided to include these points.

# **A P P E N D I X**



## Appendix A: GLOSSARY of TERMS Related to this Scenario

**Abiotic** - Nonliving components of a habitat, i.e. air, water, soil,

**Biotic** - Living components of a habitat, i.e. plants, animals, fungi

**Arthropod** - An invertebrate with a segmented external covering and jointed limbs

**Caterpillar** - The larval form of a moth or butterfly

**Chrysalis** - The case formed by a butterfly to protect the pupa

**Data** - Information collected during an experiment

**Entomology** - The study of insects

**Threatened** - Any species which are likely to face extinction in the near future; may be classified as vulnerable, endangered, and critically endangered, depending on the degree to which they are threatened.

**Insect** - An arthropod that has three body segments (head, abdomen, thorax) and three pairs of legs

**Lepidoptera** - The order of insects that contains butterflies and moths: *lepid* = scale and *ptera* = wing

**Habitat** - The place where an organism lives; provides food, water, shelter, and space

**Biodiversity** - May be evaluated as diversity in a habitat, species diversity, or genetic diversity

**Host Plant** - Type of plant that is a food source for larva

**Mimicry** - Type of defense mechanism in which one butterfly resembles a poisonous butterfly; i.e. viceroy and monarch

**Univoltine** - Refers to butterflies that have only one brood per year

**Bivoltine** - Refers to butterflies that have two broods per year

**Multivoltine** - Refers to butterflies that have more than two broods per year

**Scientific Method** - An organized method for solving a scientific problem and acquiring new knowledge about a concept or observed event

## Appendix B: HELPFUL RESOURCES

### Websites

Butterflies & Moths of North America - <http://www.butterfliesandmoths.org/>

Illinois Butterfly Monitoring Network - <http://www.bfly.org/>

North American Butterfly Association - <http://www.naba.org/>

The Science Spot: Insect Links for Kids -  
<http://sciencespot.net/Pages/kdzinsect.html>

### Printed Resources

Field Guide to Butterflies of Illinois - Available from the Illinois Natural History Survey; for ordering information visit:  
<http://www.inhs.uiuc.edu/inhsreports/winter-01/guide.html>

Butterflies through Binoculars - Available through most bookstores  
ISBN-10: 0195106687

Golden Guide: Butterflies & Moths - Available through most bookstores  
ISBN-10: 1582381364

### Curriculum Resources

Biodiversity Basics - Available from the Illinois Department of Natural Resources  
Curriculum Guide

- Available at  
<http://www.dnr.state.il.us/lands/education/CLASSRM/biodiversity/>
- The video guide and lessons are included in the Supplemental Information section.

Biodiversity of Illinois Video

- Available at  
<http://dnr.state.il.us/lands/education/CLASSRM/videos/videos.htm>
- Teachers may also request a copy of the *Exploring Illinois' Natural Resources* DVD, which contains the video and videos from other DNR educational programs.