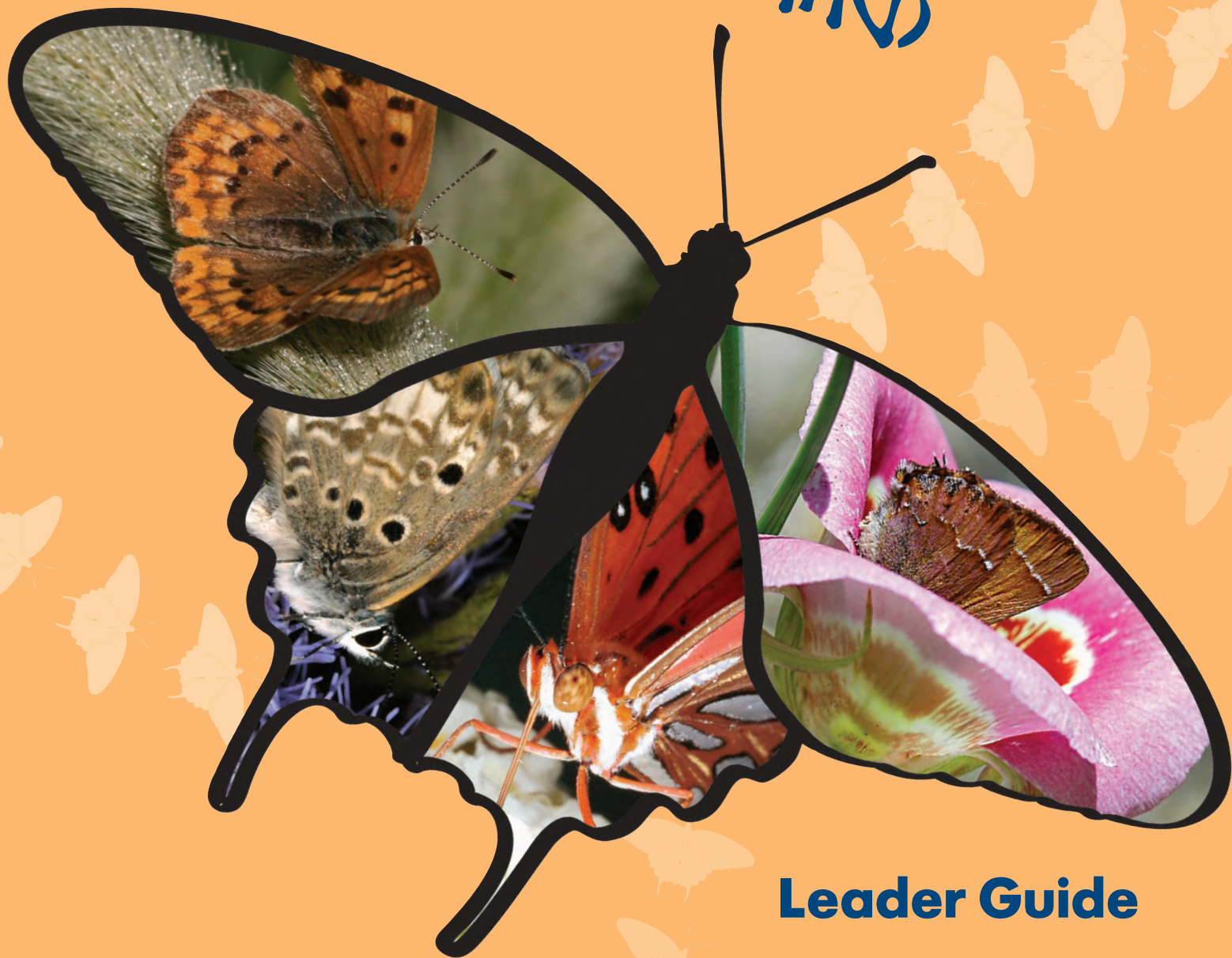




REVIEWED & RECOMMENDED
National 4-H Curriculum

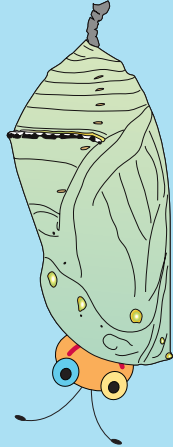
National 4-H Curriculum
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Project Butterfly WINGS



Leader Guide





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www.flmnh.ufl.edu/wings

For ordering information contact National 4-H Council Supply Service at: (301) 961-2934

Welcome to Project Butterfly WINGS!

Winning Investigative Network for Great Science

As a Project Butterfly WINGS leader, help your youth take flight on the wings of discovery! You need not know anything about butterflies. WINGS provides the necessary tools to take you and your youth from beginning butterfly watcher to citizen scientist. Along the way, youth learn important daily life skills they can apply to other areas of their lives.

Why butterflies?

In the introduction to *Florida's Fabulous Butterflies* by Tom Emmel, Mark Deyrup writes, "We are unfamiliar with the creatures outside, but comfortable with the human world. Butterflies are an invitation into the natural world and an introduction to the huge realm of insects, which seems particularly strange and threatening to many. But there is nothing scary about butterflies; indeed their beauty is almost impossible to resist. It is no wonder that so many scientists can trace the origin of their careers to an early fascination with butterflies."



Project Goals

What

- 🦋 Engage youth in science.
- 🦋 Youth learn about butterflies and their role in the environment, and our connection with them.
- 🦋 Youth contribute to authentic, hands-on collaborative research with scientists.
- 🦋 Engage youth in guided and youth-initiated inquiry.

How

- 🦋 Youth make new discoveries through regular outdoor exploration.
- 🦋 Youth participate in investigations of butterfly biodiversity, distribution and other butterfly topics.
- 🦋 Youth participate in citizen science through long-term butterfly monitoring.
- 🦋 Leaders empower youth to make decisions about what they want to learn.

Introduction to Project Butterfly WINGS

Project Butterfly WINGS consists of a youth guide, leader guide and web site.



Youth Guide

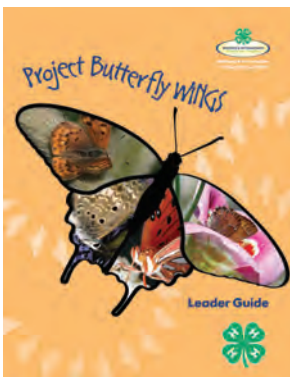
The youth guide is designed for youth in grades four through eight, or ages 9 to 13, but it may be used by youth of any age based on the youth's science skills, knowledge and interest.

- ✧ Activities are arranged sequentially to build youth knowledge and skills.
- ✧ Youth develop observation skills and sharpen their butterfly identification and science inquiry skills through both indoor and outdoor activities.

✧ The youth guide is designed for an individual to progress through at his or her own pace. However, it also may be used as a family or group project.

✧ The youth guide has four chapters. Youth begin by exploring and observing the world around them. Youth then learn where to find and how to identify common butterflies. They contribute to science knowledge when they enter their butterfly data on the WINGS web site. Finally, they create an investigation to answer their own questions.

✧ Each activity provides "Explore (Learn, Contribute, Investigate) More!" extensions, journaling and a "Stewardship Quest" statement or question for youth to consider how their actions affect the environment.



Leader Guide

The leader guide provides supplemental information on assisting youth with their project experiences and engaging group activities that are adaptable to 4-H project groups, clubs, after-school programs, camps or other youth groups. Group activities promote sharing and thoughtful discussion among participants.

Each group activity includes:

- ✧ Science connections
- ✧ Life skills
- ✧ Setting
- ✧ Time
- ✧ Materials





Web site

<http://flmnh.ufl.edu/wings>

The primary purpose of the WINGS web site is to facilitate the citizen science component of WINGS in which youth enter data about butterflies they see. This makes the butterfly data available to participants, scientists and the public. The web site also can be used for additional activities:

- Provides the ability to make custom butterfly identification sheets of local butterflies. These also can be used for group activities such as “Sort it out” and “WINGS BINGO.” Two pages of eight different butterflies can be laminated back to back, providing 16 butterflies for quick identification.
- Contains downloadable forms and activity materials, includes information about butterflies, links to other sites and an art and photo gallery.

Citizen Science

Regular, long-term monitoring of butterflies at one site provides data that adds to our knowledge of butterfly populations. WINGS is a citizen science project with participants helping to answer questions professional scientists have about butterflies. Questions lepidopterists want answered:

1. Are butterfly ranges changing?
2. Are butterflies seen earlier or later each season than previously recorded?
3. Are common butterflies still common?
4. How many different butterfly species occur in an area?

4-H youth and leaders participate in citizen science when they collect information and report it to the WINGS web site. As the information accumulates, it reflects any changes in butterfly locations and populations. Not all species of butterflies found in the United States are included in the web site. The reason is that WINGS tracks only the most common and easily identifiable butterflies. Scientists at the Florida Museum of Natural History’s McGuire Center for Lepidoptera and Biodiversity in Gainesville, Florida, one of the most comprehensive butterfly research programs in the world, determined the butterflies they want WINGS youth to monitor. If youth find a butterfly that is not on the WINGS web site, encourage them to keep a “life list,” a list of all species they have seen.

In Chapter Three of the youth guide, youth determine locations to collect data for individual date lists. In Chapter Three of the leader guide, your group selects a permanent group site to adopt for transect surveys. Monitoring at a dedicated site over time ensures consistent data about butterfly populations and contributes to the citizen science component of WINGS.

Web site Privacy Policy

WINGS complies with the Children’s Online Protection Policy Act, or “COPPA,” and never requests the identity of youth or their geographic location. Information about COPPA is on the WINGS web site. Leaders register their youth, and youth use passwords. Please see page 8 for web site registration instructions.

How to get the most out of the WINGS adventure

Butterfly watching

WINGS is designed to pique interest in butterflies and participation in science inquiry without interfering with the butterflies. Being a field observer fosters an appreciation for the big picture view of the butterfly—its habits, flight patterns, host plants and habitats—and provides opportunities for youth to hone their observation skills.

Not sure what you saw?

If you or your youth are not sure about the identity of a butterfly, list it as unidentified. While skills are developing, the observation process of butterfly identification is important. Don't guess, it is more important to list a butterfly as unidentified. Take field notes about the butterfly. Size, color, markings and location spotted can be used to help make a correct identification.

Ask questions

Exploration builds observation skills and leads youth to formulate questions. In Chapter 4, youth investigate a butterfly-related topic they choose. Reinforce the process of asking questions as you guide your youth.

Collecting butterflies and life cycle purchases

Taking butterflies out of an area by collecting them, or adding them through releases from life cycle purchases, affects the citizen science data by producing results that do not reflect what is found naturally. To observe the life cycle closely, encourage youth to raise larvae and pupae they find nearby and release the butterflies where they found the earlier life stages. Also, rather than collecting, WINGS focuses on "hands-off" observation, science inquiry and curiosity surrounding butterfly behavior, population abundance and how butterflies fit into their habitats.

Which butterflies live near you?

Why do larvae eat so much?

What happens inside a pupa?

What do butterflies eat?

How long do butterflies live?

Where do butterflies go in the winter?

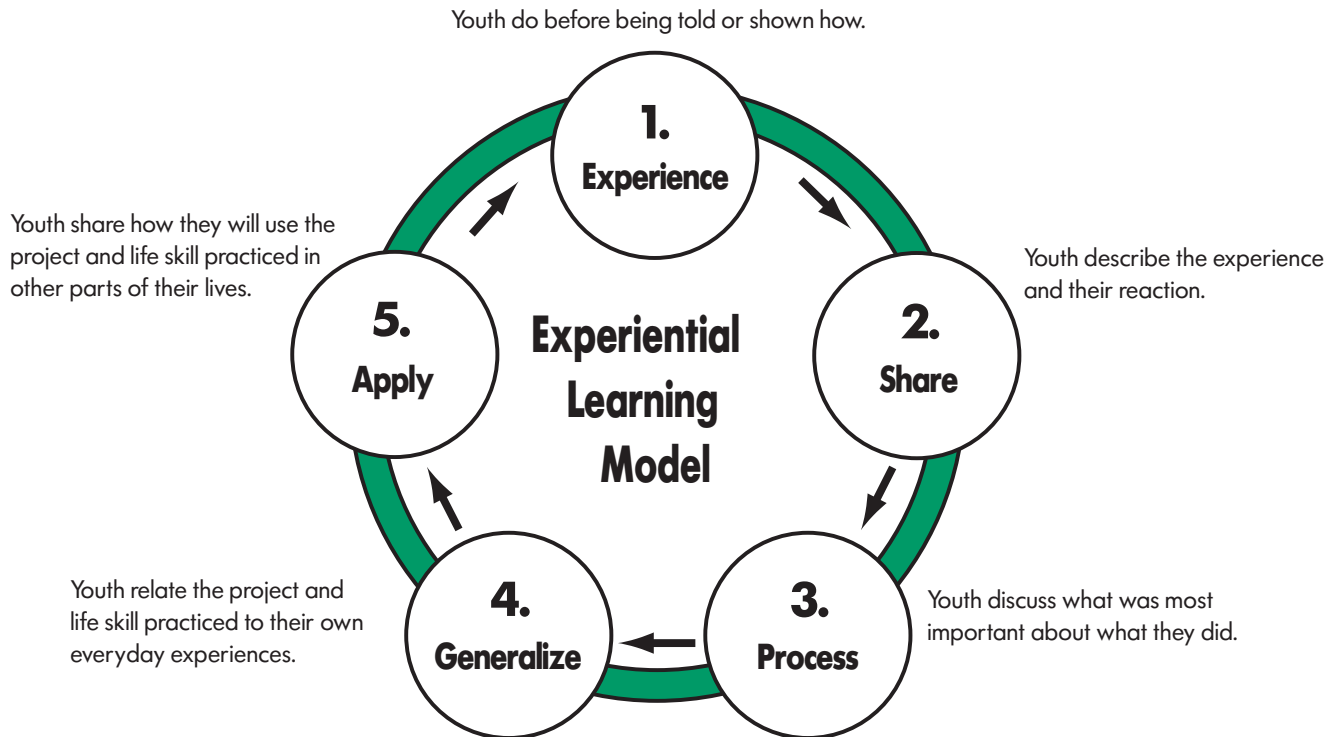
Where can you find butterfly eggs and larvae?



Gulf Frithlary

The Experiential Learning Model

The experiential learning model is used throughout Project Butterfly WINGS to help youth gain the most from their participation. Discussion follows each activity. Your role as a project leader and learning partner is to help youth think about what they are learning and the broader applications both now and in the future.



Pfeiffer, J.W., & Jones, J.E., "Reference Guide to Handbooks and Annuals"
1983 John Wiley & Sons, Inc. Reprinted with permission of John Wiley & Sons, Inc.

All activities conclude with Reflect and Connect

The questions can guide your discussions of content as well as the science inquiry process or life skills being learned with each activity:

How'd it go? Youth talk about what they did and what happened.

Go back What did youth learn from the activity?

Go bigger How can youth relate this experience to other areas of their life? Look at the bigger picture.

Go beyond How can youth apply what they learned in new ways?

Your role as a project leader and learning partner is to help youth think about what they are learning and the broader applications both now and in the future.

The Journal Reflection encourages youth to write about their experiences with the activity. Additional journal pages are included at the end of each chapter for field notes and reflections. See the inside back cover of the youth guide for an example. Making field notes is an important scientific skill and in WINGS, it enables youth to practice what they learn.

Scientific Inquiry: What is inquiry-based learning?

The National Science Education Standards explain the importance of inquiry-based learning:

Students at all grade levels and in every domain of science should have the opportunity to use scientific inquiry and develop the ability to think and act in ways associated with inquiry, including asking questions, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, constructing and analyzing alternative explanations, and communicating scientific arguments. (National Research Council, 1996, p.105)

What does it mean to do an inquiry-based project?

Inquiry is the heart of the learning process promoted in WINGS. In traditional teaching models, the teacher dispenses knowledge and the student passively absorbs it. With inquiry, youth actively reason and engage in investigations they design. Inquiry learning empowers youth to discover what interests them and encourages them to use their skills to further their knowledge. In general, inquiry includes three steps: question, investigate and communicate results.

Types of Inquiry

There are three types of inquiry. The descriptions will help you understand ways you can implement inquiry-based learning throughout the WINGS project. You can engage youth through any type of inquiry, but certainly guided and open are more empowering. Which ones you use may depend on the level and interests of the youth. Be flexible in your approach.

Structured

Leaders give youth a question to answer, a way to answer the question and the necessary materials, but not the expected outcomes. Example: "Let's investigate how many days it takes a Black Swallowtail to emerge as a butterfly from its pupa. We can raise the larvae we found in the garden to find the answer."

Guided

Youth must figure out a way to answer a question given by the leader. Example: "I notice we see the same kind of butterflies around the garden. How do you think we can increase the variety of butterflies in our garden?"



Open

Youth formulate the question they will investigate and determine ways to answer it. Example: Youth ask "How do the butterflies in my garden at home compare to the butterflies I see at this park?"



What is 4-H SET?

What are the Curriculum Components?

4-H SET is 4-H's response to the needs of youth to develop curiosity, abilities, and deepened learning in the areas of science, engineering, and technology (**SET**). Steeped in over 100 years of experience in working with youth in a variety of non-formal science education settings, 4-H plays a leading role in engaging youth to explore **SET** with trained and caring adults in a positive youth development environment. 4-H works from a common framework, including National Science Education Standards, to increase literacy and improve abilities in science, engineering, and technology. **4-H SET** is preparing today's youth and America's future workforce.

An Effective 4-H SET Experience Engages Youth Through:

Content

- Science, Engineering, and Technology content based on the National Science Education Standards
- SET Abilities

Context

- The Essential Elements of Positive Youth Development, fundamental to 4-H:
 - mastering life challenges
 - cultivating independence with guidance from caring adults
 - developing a sense of belonging within a positive group
 - sharing a spirit of generosity toward others
- Reliance on trained, caring adult staff and volunteers acting as mentors, coaches, facilitators, and co-learners
- Perspective that youth are partners and resources in their own development
- Inquiry-based, hands-on, experiential approach to learning that fosters the natural creativity and curiosity of youth

Delivery

4-H SET engages 6.5 million youth each year through a variety of settings, including clubs, camps, special interest groups, online, in- and out-of-school programs.

For additional information regarding SET concepts, standards and abilities, please refer to: SET Programming in the Context of 4-H Youth Development located at: www.4-H.org

4-H Pledge



I pledge
my **head** to clearer thinking,
my **heart** to greater loyalty,
my **hands** to larger service,
and my **health** to better living,
for my club, my community, my country, and my world.

Name:

Group or club name:

www.flmnh.ufl.edu/wings



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