

TROPICAL BUTTERFLY HOUSE

TEACHER PRE-VISIT



EXHIBIT HIGHLIGHTS

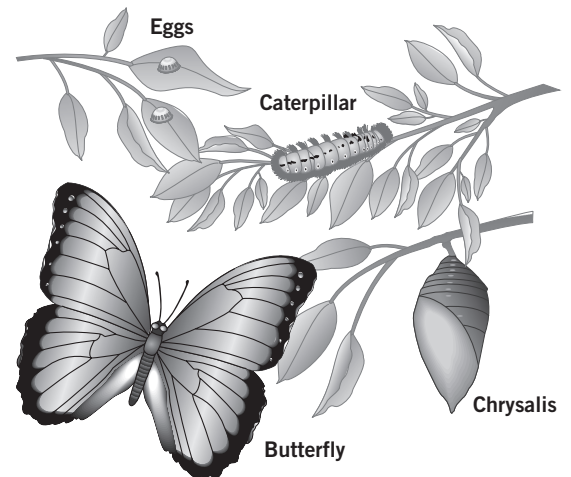
The 365-day forecast calls for sunshine, temperatures around 80 °F with humidity between 60 and 70 percent. A field trip to the tropics can be as easy as a visit to Pacific Science Center's Tropical Butterfly House!

The Tropical Butterfly House is a climate controlled, living exhibit landscaped with exotic trees and flowering plants where free-flying butterflies feed, sun themselves and interact with each other and with visitors.

BUTTERFLY INFORMATION

Butterflies and moths belong to the order Lepidoptera which means "scale wing". The name refers to the delicate scales that give moths and butterflies their colorful wing patterns.

Every butterfly begins life as an egg. When the egg hatches a tiny caterpillar comes out. As the caterpillar eats the surrounding leaves and grows, it sheds its skin (molts) and develops a bigger skin. After the caterpillar is fully grown it becomes a pupa, or a chrysalis. Inside the chrysalis, the caterpillar changes into a butterfly. When the change is complete, the new butterfly wriggles around until the chrysalis splits open. The butterfly emerges and hangs upside down letting its wings unfold and dry until it is strong enough to fly. The butterfly, which may live no longer than one week, concentrates on eating and mating so that it can lay eggs and continue the butterfly lifecycle.



Each species of caterpillar has a distinct preference for the types of plants it will eat. Since caterpillars eat a great deal and are a danger to agriculture, Pacific Science Center is not allowed to raise caterpillars in the Tropical Butterfly House, thus a constant chrysalis supply must be maintained to stock the Butterfly House with butterflies. The Butterfly House was carefully planned so that there are no plants suitable as caterpillar food. This environmental control has serious implications for butterfly reproduction. If a butterfly cannot find a suitable plant on which to lay eggs, it will usually not do so. It is extremely rare for the butterflies in this exhibit to lay eggs.

IMPORTANT NOTES TO TEACHERS:

Food and beverages are not permitted in the Tropical Butterfly House. Please encourage your students to leave their coats in the cubbies provided at the entry.

It is critical that students understand that butterflies are fragile and touching or chasing them may damage their wings and other body parts. Discuss prior to your visit how observations can be conducted without touching the butterflies.

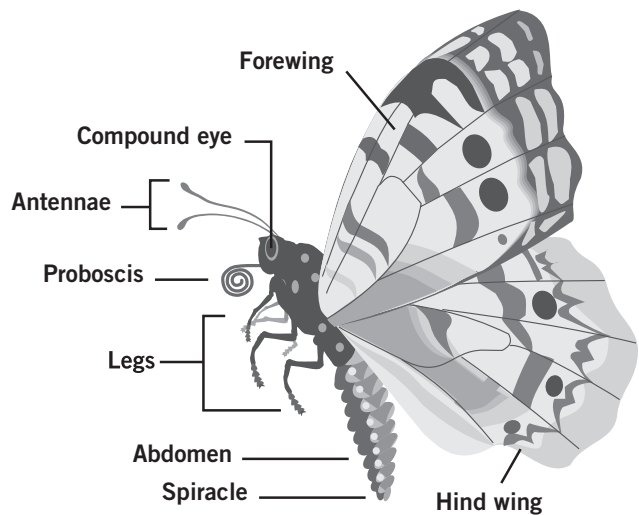
To ensure that butterflies remain inside the exhibit, visitors pass through a vestibule upon entering and exiting. Large classes may have to break into smaller groups to use these vestibules. This can take several minutes, so please plan ahead if you have an **IMAX® movie** or other scheduled event planned after your visit to the **Tropical Butterfly House**.



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PRE-VISIT DISCUSSION

- Many people dislike most insects except butterflies. Why? Discuss characteristics of all insects and what students think make butterflies unique.
- Some characteristics of living organisms are that they eat, grow and reproduce. Discuss the general characteristics and also the unique features of butterflies as living organisms. Particularly, discuss how they eat flower nectar through their proboscis and their dramatic metamorphose from caterpillar to butterfly via chrysalis formation. Make a list of what students know about butterflies prior to the visit.
- Let each student draw a butterfly and label the parts, without the aid of a book or other resource. Display the pictures.



POST-VISIT DISCUSSION

- Review and amend the list you may have made of students' prior knowledge of butterflies.
- Discuss how the lifecycle of the butterflies of the Tropical Butterfly House is incomplete. What stages of the lifecycle are present and what stages are missing? How does Pacific Science Center control the butterfly environment and what impact does this have upon the butterfly lifecycle?
- Let each student draw and label the parts of a butterfly. Display these next to the pre-visit drawings and discuss any differences between the two drawings.
- Discuss some of the questions students had about butterflies from the observations they made. Ask students to design investigations that could answer those questions.

Essential Academic Learning Requirements (EALRs) for Washington state addressed in this flyer*:

EALR 4: Domains of Science: Life Science

Big Ideas:

- Plants and animals have structures and behaviors that respond to internal needs.
- Plants and animals have life cycles.
- Human impacts on ecosystems affect the ability of organisms to survive.

EALRs 1 & 2: Crosscutting concepts and abilities

Systems: Describe what is going into the Tropical Butterfly House system and how that affects the output of the system.

Inquiry: Ask and answer questions by making observations or trying things out.

**To find out about EALRs addressed in the exhibit, please refer to the Tropical Butterfly House EALR chart in your package.*

Please feel free to use the Student Activity Sheet,
in part or whole, as an on-site activity for your class.

TROPICAL BUTTERFLY HOUSE

STUDENT ACTIVITY SHEET



BUTTERFLY BRIEFING

BUTTERFLY INFORMATION

Butterflies and moths belong to the order Lepidoptera (lep-i-dop-ter-uh) which means "scale wing".

The name refers to the delicate scales that give moths and butterflies their colorful wing patterns. Every butterfly begins life as an egg. When the egg hatches a tiny caterpillar comes out. As the caterpillar eats and grows, it sheds its skin (molts) and develops a bigger skin. After the caterpillar is fully grown it becomes a pupa and forms a covering around its body called a chrysalis. Inside the chrysalis, the caterpillar changes into a butterfly. When the change is complete, the new butterfly wriggles around until the chrysalis splits open. The butterfly comes out and hangs upside down letting its wings unfold and dry until it is strong enough to fly. The butterfly, which may live no longer than one week, concentrates on eating and mating so that it can lay eggs and continue the butterfly lifecycle.

Caterpillars are picky eaters. Most species have strong preferences for the types of leaves they will eat. Since caterpillars eat a great deal and are a danger to agriculture, Pacific Science Center is not allowed to grow caterpillars in the Tropical Butterfly House. The Butterfly House was carefully planned so that there are no plants that caterpillars will eat.

BUTTERFLY BEHAVIOR

You might notice some or all of these behaviors in the Tropical Butterfly House. Put a check mark next to each behavior you observed.

- Puddling:** Watch your step! Male butterflies sip water from sandy puddles of water on the ground, probably to gain minerals needed for reproduction.
- Spiraling:** Rival butterflies chase each other in spiral flight patterns.
- Eating fruit:** Some butterflies supplement their flower nectar diet by sipping overripe fruit juices with their proboscis.
- Sunning:** Even in warm weather, butterflies bask, with their wings open, to absorb sunlight.
- Emergence:** Butterflies wiggle a lot to get out of their chrysalises. See if you can find a wiggling chrysalis or a butterfly that is actually emerging from its chrysalis.

Choose a butterfly, tropical plant/flower or chrysalis and draw it here.



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THINGS TO THINK ABOUT AND DO

- Observe for two minutes either the chrysalis viewing window or butterflies feeding at a fruit feeding station. What do you notice?

- Write at least one question you have about what you observed at a feeding station or at the chrysalis viewing window.

- Think about what the butterflies in the Tropical Butterfly House eat. How is this different than what they would eat in the wild?

- What other differences can you think of about how butterflies live in the exhibit and how they would live in the wild?

- Borrow a picture guide available in the Butterfly House and use it to identify the butterflies you see. Write the name of your favorite species and something you liked about it.

- Ask another student which is his or her favorite and why. Write that student's name and his or her answer here.

- Choose two different species of butterfly to observe. List three similarities and three differences you noticed between the two butterflies.

- Re-read side one of this sheet. Think about what butterflies need at each stage of their lifecycle. It is rare for a butterfly to lay an egg in the Tropical Butterfly House. Why do you think this is?

TAKE IT AWAY:

Write one new fact you learned, or something that surprised you today about butterflies or the **Tropical Butterfly House**. Share this with someone you live with.
