

Smithsonian

# Designing Butterfly Exhibits



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The background of the page is a collage. On the left and bottom, there are several colorful butterflies, including a large yellow and black one in the top left, a blue and white one in the middle left, and a large yellow and black one in the bottom center. On the right side, there is a faint, stylized diagram of interlocking gears and circles in shades of blue and white.

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# Beautiful Butterflies

A brightly colored butterfly spreads its wings and takes flight. A spotted butterfly drinks sweet nectar from a nearby flower. A group of butterflies flutters around a flowering bush, looking for places to land.

From where you stand, you see butterflies flit and float around you. Their delicate wings brush against your arms. They dance in front of your eyes. You are surrounded by winged creatures. Lush plants and blooming flowers are everywhere in this warm and **humid** (HYOO-mid) place.

A place where you can go and be surrounded by butterflies might seem like a dream. But butterfly exhibits are real. They serve an important role, too.

Butterflies are an important part of **ecosystems**. Sadly, many butterfly species are at risk of **extinction**. This is where butterfly exhibits come in. In enclosed spaces, we can learn more about these winged creatures. We can see how their lives are linked with the plants they depend on. And, we can learn what we can do to protect these insects from the dangers of living in the wild.

A group of butterflies is called a kaleidoscope (kuh-LIE-duh-skohp). A group of caterpillars is called an army.



tree nymph  
butterfly



# In the Wild

Butterflies are more than just bright colors and pretty wings. They help to **pollinate** flowers and plants. Many plants depend on pollinators, such as butterflies, to survive. Without them, these plants would not be able to grow new seeds.

Butterflies are also important to food chains. They are food for other animals. Many birds, bats, and mice eat butterflies and caterpillars. When butterflies leave or die, the animals that eat them have less food. They will soon move to a new place that has more food for them. In turn, larger animals that eat birds, bats, and mice have less to eat, too.

Scientists use butterflies to measure the health of an area. If butterflies leave a place or begin to die in large numbers, scientists pay attention. It is a sign that something has changed.

More problems may be on the way. The opposite is true, too. Seeing lots of butterflies and caterpillars is a good sign that an area is healthy.



A bird catches a caterpillar.



A mouse feeds on monarch butterflies.

A praying mantis  
eats a butterfly.



A butterfly collects  
pollen from a plant.

Butterflies pollinate more  
plants than any other  
insect except for bees.



Life in the wild is hard for butterflies. In the last 20 years, the population of many types of wild butterflies has dropped. This is especially true for the monarch butterfly.

In the 1990s, there were more than 1 billion monarchs in the world. Over the next 25 years, that number dropped to 35 million. No one knows for sure why this happened. But scientists have a few ideas.

Some scientists think butterflies are laying fewer eggs than they did in the past. **Herbicides** (UHR-buh-sides) are sprayed on big areas of land to kill weeds. The sprays also kill the plants that butterflies feed from and lay eggs on. This is a big problem. Butterflies fill many roles in their ecosystems. Without them, many things go undone.



A butterfly lays eggs.



A worker sprays herbicides.

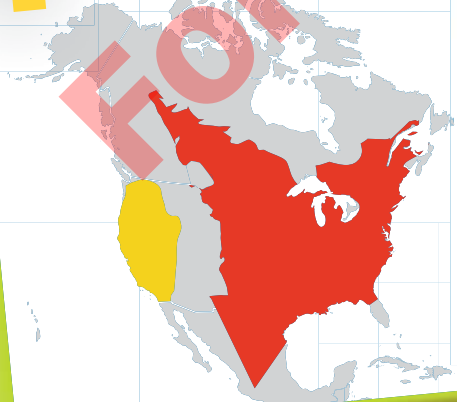




Monarch butterflies land on tree branches.

### North America's Monarch Population

- Eastern population
- Western population



## MATHEMATICS

### Counting on Butterflies

Scientists keep track of how many butterflies live in the wild. But counting each one would take too long. Instead, scientists estimate. They count small groups of butterflies. Sometimes, they see butterflies in very large groups, or clusters. In these cases, they count a small section and use that number to estimate how many there are in the cluster.





# STEAM CHALLENGE

## Define the problem:

Butterflies around the world are losing their habitats. Some people have removed plants that butterflies depend on. One way we can help is by making butterfly feeders. Your task is to design and build a butterfly feeder that will attract local butterflies.



**Constraints:** You can only use recycled or found items to build your butterfly feeder.



**Criteria:** Your feeder must have a way to attract butterflies. To appeal to many people, your feeder's height must be adjustable to at least two different heights.





## Research and Brainstorm

What do butterflies eat? What are butterflies attracted to? How big should you make your butterfly feeder?



## Design and Build

Sketch your design. What about your feeder design will attract butterflies? What materials will work best? Build your feeder.



## Test and Improve

Present your design to other students. Explain how it will attract butterflies. Set up your butterfly feeder. Test it by adjusting it to a different height. Does it stay in place? Is it stable? Get feedback. Modify your design and try again.



## Reflect and Share

What materials would you use if they did not have to be recycled? What are other ways you could help butterflies? Which part of the process was most challenging?