

The Longleaf Forest is Alive with the Beautiful Colors of the Butterfly

(bolded words in text indicate key words and concepts)

Student Information:

During the summer and fall seasons, a longleaf forest floor is covered with wildflowers. Beautiful butterflies flutter from flower to flower, feeding and pollinating in the process.

Teacher Information:

The fire-maintained, open-canopied longleaf forest is typically filled with the wildflowers of many plant species, especially during the summer and fall seasons. This meadow-like scene is enhanced by the presence of scores of "flying flowers". Colorful **butterflies** flit from flower to flower, feeding and **pollinating** in the process. Many of these species are attracted to the flowers of specific species of plants, probably attracted by both odor and color. Some of the flowers depicted in this drawing include the bright orange **milkweed**, also called butterfly weed; the intricate purple and white passion-flower, white flag paw-paw, and yellow partridge pea, a delicate **legume**. The fruit of the butterfly weed is a typical milkweed pod, filled with light-as-a-feather seeds and downy "wings" to carry them on the wind. Passion-flower fruits are melon-like and locally known as may-pops, perhaps for the "pop" they make when stepped on. Like all legumes, the partridge pea yields a seed-filled pod. The butterflies included in this drawing are (starting at the top left and proceeding in counter-clockwise fashion) 2 Monarchs, the 2 Eastern Tiger Swallowtails, 2 Cloudless Sulphur butterflies, a Zebra Longwing, A Gulf Fritillary, and at top center, a Zebra Swallowtail.

Both the larvae, called **caterpillars**, and butterflies feed voraciously on the leaves and stems of a variety of **host plants**. Some caterpillars are **host specific**, feeding only on one particular type of plant. Both the Zebra Longwing and Gulf Fritillary use the passionflower as a host plant. The Zebra Swallowtail feeds on the white flag paw paw. Both the Eastern Tiger Swallowtail and Monarch flit on the butterfly milkweed. The Cloudless Sulfur is particular to partridge pea.

At a certain point in the life cycle of butterfly larvae, hormones begin trigger the caterpillars to encase itself in a cocoon. This new life stage is called the pupal stage. Cocoons may be found on specific host plants. While in their cocoons, further changes in hormones cause a **metamorphosis** of the caterpillar, and it emerges as a beautiful butterfly.

Certain butterflies, like monarchs, contain poisonous, distasteful substances that are accumulated from the plants that they eat (milkweed toxins in this case). A young bird like a blue jay may try to feed readily on the monarch. Shortly afterwards, this blue jay will regurgitate the butterfly it just tried to consume. After just one or two such experiences, the bird will absolutely avoid this species. The blue jay now associates the eating of the monarch butterfly with bad tastes and has modified its behavior accordingly. This behavioral modification is called **operant conditioning**. The bright orange color probably helps make quick recognition easier by the blue jay. Some butterfly species that are edible, such as the viceroy butterfly **mimic** the monarch and, thus, may also avoided by birds.

Key Words and Concepts: butterfly, caterpillar, host plant, host specific, legume, metamorphosis, milkweed, mimicry, operant conditioning, pollination.