

# Honey Bees - Biology

## Educator's Overview: Insects and Honey Bee Biology



More than 25,000 species of bees have been identified around the world. In the continental United States, scientists believe there are approximately 3,500 species of bees. Bees known as honey bees are represented by eight to ten species in the genus *Apis*, a name from which comes the word for beekeeping (apiculture) and the word for a bee yard (apiary). The species of honey bee commonly found today in the Americas is *Apis mellifera*, which means honey carrier. This name is not technically correct as the bees carry nectar from flowers, which they then use to produce honey back in the hive. Races of *Apis mellifera* have different physical and behavioral characteristics such as body color, wing length, and susceptibility to disease.

As insects, honey bees pass through four distinct life stages: the egg, larva, pupa and adult. Complete metamorphosis takes between 16 and 24 days depending on the sex of the developing bee. A queen bee lays an egg in an individual wax cell. The egg hatches into a white legless larva on the fourth day. The larva feeds on royal jelly and beebread (a mixture of nectar and pollen) until it reaches mature size and then spins a cocoon around itself. The cell is capped with wax and the larva transforms into the pupa. The pupa develops into a mature adult bee inside the capped cell. When fully developed, the mature bee chews its way out of the cell. Adult worker bees live approximately 45 days during the summer months.

There are three types of adult bees that make up a honey bee colony. The great majority (about 99 percent) of adult honey bees are sterile female worker bees. Worker bees develop from fertilized eggs. Worker bee larvae are fed royal jelly for only three days. Then they are fed beebread (a mixture of nectar and pollen) for the remaining larval stage. Passing through the immature stages (complete metamorphosis) takes 21 days for worker bees.

The male members of the colony are called drones. Drones (male bees) develop from unfertilized eggs that are laid in larger cells. Drones are also fed royal jelly for three days and are then fed beebread. Drones remain in the pupal stage for 15 days and emerge as adults on day 24. Drones have wider bodies than worker bees, rounded abdomens, and no stingers.

Queen bees develop from fertilized eggs in the largest cells in the hive. Larva destined to become a queen bee is fed royal jelly for the entire larval stage. Queen bees develop in only 16 days.