



## Pollinators or Pests?

About 75% of plants need pollinators to reproduce. The pollinators are usually bees, wasps, moths, butterflies, beetles, and birds. After reading the book for the first time, look again at each of the following pages with the students to discover which pages have pollinators on them. Since the pages are not numbered, the following list shows the riddle page with the birds, bugs, or animals illustrated.

- **Apple** riddle page ~ **Wren**
- **Lettuce** riddle page ~ **Cottontail rabbits**
- **Carrot** riddle page ~ **Black swallowtail caterpillar**
- **Broccoli** riddle page ~ **Harlequin bugs** and **Cabbage white butterflies**
- **Blueberry** riddle page ~ **Mockingbird**
- **Celery** riddle page ~ **Robin, Worms** and **Slug**
- **Tomato** riddle page ~ **Ladybug/Lady beetles**
- **Cucumber** riddle page ~ **Bumblebee**
- **Potato** riddle page ~ **Spider** and **Potato beetles**
- **Onion** riddle page ~ no pests or pollinators
- **Corn** riddle page ~ **Crow** and **Bumblebees** -
- **Squash** riddle page ~ **Squash bug** and **Squash bee**
- Last page ~ **Green darner** (dragonfly)

Following is some information about the pollinators/pests that could be shared with the students. Pick 3 or 4 of them and discuss how they are helpful or harmful to plants.

- **Black swallowtail caterpillar** - Caterpillars forage heavily on their host plants, but they also serve as a food source for songbirds and other wildlife. After their metamorphosis into butterflies, they become pollinators, which is important because one-third of the world's cultivated crops depend upon the work of pollinators like butterflies and bees.
- **Harlequin bugs** - Harlequin bugs suck fluids from plant tissue. They leave yellow or white blotches on areas of leaves where they have been feeding; heavy infestations can cause plants to wilt, turn brown, and die.
- **Cabbage white butterflies** - Cabbage white larvae, called cabbage worms, are green with five lengthwise yellow stripes, and are covered with short fine hairs. After hatching, larvae feed on the underside of their host plant's leaves during their first week, and feed from the topside during their second week. Cabbage worms grow to three-quarters of an inch long and molt five times before entering their pupal stage. Crops are unmarketable after a cabbage worm infestation. Adult cabbage white butterflies pollinate plants as they feed on nectar from many flowers, including dandelions, red clover, asters, mint and strawberries.
- **Worms** - Worms are some of a garden's best friends. They tunnel through the soil allowing water and air to get to the roots. They also leave behind castings which provide nutrients for the plant.
- **Slugs** are one of the most destructive and difficult pests to control. Seedlings of many vegetables and flowers are favored foods and high populations of slugs can cause difficulties in establishing a crop. Slugs also feed on many fruits and vegetables prior to harvest. This pre-harvest feeding results in wounds that allow various fungi and bacteria to enter and spoil the crop
- **Ladybugs also called lady beetles** are good insects. Not all lady beetles are females - lady beetle is just their name! They feed on many bad insects found on vegetables and flowers. Most adult lady beetles are red with black dots, but some are other colors. Ladybeetles are colored brightly to warn birds or other animals that they taste bad. If you have ever held a lady beetle, sometimes they emit a yellow liquid from their body when they feel threatened. When a bird or insect eats a lady beetle, the lady beetle makes that

same yellow liquid seep out of its body. That yellow liquid tastes bad to other animals and makes them sick. The lady beetle's bright red color helps remind the animal not to eat another lady beetle. Lady beetles are such good predators that garden stores sell them as a form of pest control! You can release them in the garden and landscape where they will eat other insects.

- **Aphids** - Aphids are a huge pest on roses, other flowers, vegetable gardens, shrubs and trees. If you find aphids in your garden, you probably have lady beetles too! Lady beetles love to eat aphids and can keep the aphids from ruining plants. Aphids are sap suckers. Their mouthparts are like a short tube or straw. They pierce their mouth into the plant and suck up all the juices. Plants have a lot of sugar in them, and aphids emit honeydew to get rid of the extra sugar their body does not need. The honeydew is emitted through two tubes on their abdomen. Too much honeydew attracts ants or can make mold grow on plants. Aphids can cause plant leaves to turn yellow and wilt. Too many aphids will kill a plant. Aphids are usually found on the underside of leaves and flowers. This is where they are most protected from the weather, sun, and predators.
- **Spider** - Spiders are the ultimate insect exterminators and work to keep the insect population in check by feeding on just about anything with more legs than you.
- **Green darner (dragonfly)** - Dragonflies love to eat insects.