

# Pollination Brainteasers Answer Sheet

Below you will find facts about important pollinators. Read through them and use them as clues to help you predict what characteristics plants might have to attract each type of pollinator. When you are done, we will review the answers to see how closely you and nature agree.

## BATS

Throughout most of the United States and Canada, bats feed strictly on flying insects. In tropical areas, however, bats feed on a variety of foods, depending on the species of bat. They might eat frogs, fish, blood (vampire bats), fruit, pollen and nectar. The bats that concern us at the moment are those that feed on pollen and nectar. If you were a plant, how would you attract them? Here are some clues:

- Bats have a good sense of smell.
- Bats have a good sense of sight. (They are not blind, although they are colorblind.)
- Bats are relatively large for a pollinator, at least compared to insects.
- What time of day are bats active?
- How much food would a bat need compared with, say, a bee?

**If you were a flower designed to be pollinated by a bat, what characteristics would you have? (Fill in the blanks below.)**

Color: white or pale in color since bats are active at night

Size: relatively large (bats are large)

Location of flower on the plant: at top or on the outside where the flower is exposed and the bats can find it

Shape: open at the top so bat can get its head inside

Scent: sweet smell to advertise the nectar the flower provides bats

Time of day when in bloom: evening—that is when bats are active

## MOTHS

- Their mouth parts are like long soda straws that they carry curled up like New Years novelty toys. Therefore, their food must be liquid.
- Most moths come out at night, as opposed to butterflies which are mostly active during the day.
- They see fairly well at very short distances, and they can see color.

- Their sense of smell, like most insects, is truly amazing. They can detect a few molecules of a scent in the air.

**If you were a flower designed to be pollinated by a moth, what characteristics would you have? (Fill in the blanks below.)**

Color: white or pale colored since moths are active at night

Shape: long, skinny tube for the moth's soda-straw tongue

Time of day in bloom: evening, since most moths are active at night

Scent: fabulously sweet, to advertise the sweet food that flowers provide moths

What the flower might provide the visiting moth: nectar

### **FLIES and CARRION BEETLES**

- These charmers like nothing better than to find a dead possum or a pile of dung on which to lay their eggs. The eggs will hatch into maggots and will have a perfect place to feast. Bon appetit!
- Like moths, they see only fairly well at short distances. (You can sneak up on them pretty easily with a fly swatter.)
- They have an amazingly good sense of smell.

**If you were a flower designed to be pollinated by flies or beetles, what characteristics would you have? (Fill in the blanks below.)**

Scent: a foul odor like rotten meat

Color: dark reddish-brown or brown, like the color of rotten meat

Why might flies and beetles visit the flowers? The fly or beetle thinks it has found a perfect place to lay eggs, but it has been tricked! The flower doesn't provide anything. Instead, the fly or beetle unknowingly pollinates the flower as it flies from bloom to bloom.

### **BEES**

A huge variety of bees pollinates flowers, ranging from tiny sting-less bees to bumblebees to honeybees. Here are some facts about bees, in general:

- They search out pollen and nectar. Some bees make honey to feed their young.

- They see colors at the short wavelength end of the spectrum, not long wavelengths. Thus, they cannot see red, but they can see ultraviolet light, which we humans cannot see.
- Their vision is OK, but they have a great sense of smell.

**If you were a flower designed to be pollinated by a bee, what characteristics would you have? (Fill in the blanks below.)**

Scent: sweet since bees have a good sense of smell and seek nectar

Colors: short wavelength colors such as blues and purples. Even white and yellow will work. Often, white flowers have streaks of color that can be seen in ultraviolet light. Bees can see these streaks, but we cannot. Bees are not attracted to red.

### **HUMMINGBIRDS**

These birds are only found in the Western Hemisphere.

- They have long, needle-like bills.
- They can see the same colors that people see.
- They cannot smell.
- They feed on tiny insects and nectar.
- They usually hover when feeding, like a miniature helicopter. They rarely perch when feeding.
- How could a flower attract hummingbirds, but not attract bees and other animals that might steal its nectar and not pollinate your flowers?

**If you were a flower designed to be pollinated by a hummingbird, what characteristics would you have? (Fill in the blanks below.)**

Color: orange and red: birds can see these colors and they stand out among greenery

Scent: no scent; birds don't have a sense of smell, so producing a scent would be a waste of energy

Shape: tubular shape to fit the hummingbird's bill

Location of anthers and stigmas: protruding from the flowers, where they come into contact with the hovering bird

### **WIND**

- Can wind-pollinated plants actually attract wind?
- What flower design might help the wind carry off pollen most effectively?
- What are the chances that a single pollen grain, when blown by the wind, will land on the right flower?

**If you were a flower designed to be wind-pollinated, what characteristics would you have? (Fill in the blanks below.)**

Color: neutral colors such as green, tan and brown; wind is not attracted to colors so the plants don't waste energy producing petals with bright colors, or sometimes any petals at all

Scent: no scent; wind is not attracted by scent

Shape of flower: something exposed to the wind; many dangle like wind chimes. Anthers are exposed so wind can catch their pollen and carry it away.

Season of bloom in most parts of country: early spring; most wind-pollinated trees produce pollen before the leaves come out. This makes it easier for the pollen to reach flowers when it is blown. Leaves would block a lot of the pollen. Stigmas are exposed to catch the pollen as it blows by.

Location of flowers on plants: at the ends of branches for exposure to the wind

Amount of pollen produced: an enormous amount; wind pollination completely relies on chance, and most pollen never reaches its intended target. (Have you ever wondered why pollen covers our car windows and so many people have hay fever at certain times of year?)