

Name \_\_\_\_\_

## Nature's Helicopters

Nature offers spectacular examples of "true flight." This refers to the ability to lift and hover above the ground without forward motion to provide these forces. People have long been intrigued with the concept of vertical flight, and as we've observed the hummingbird and the dragonfly, we've been able to develop technology (such as the helicopter) that mimics their behavior. The hummingbird hawk-moth is another animal that has the same flight dynamics.

Although this moth gets the first part of its name from its flight patterns, it resembles a hummingbird in other ways as well. The moth has a long, straw-like mouth, which it uses to gather nectar from flowers. While hovering, it emits an audible humming noise. Its constant wing movement requires large amounts of food, similar to hummingbirds. Hummingbird hawk-moths keep track of flowers they have already visited. This conserves energy since the moth doesn't return to empty flowers. The need for calories is so strong, they

may even feed while mating. As the second part of this animal's name implies, it is a moth, not a bird. As an insect, it pollinates various garden flowers such as honeysuckle.

The hummingbird hawk-moth is native to warm climates. It makes its home in parts of Europe, North Africa, and Asia. It is a strong flier, particularly during the summer months. The moth does not tolerate cold weather well, and adults typically spend winter in crevices of rocks, trees, and buildings. Although in a different group, a similar moth known as a "bee moth" can be found in various parts of North America.

Hummingbird hawk-moths have good vision and are able to learn colors. The moth has the ability to fly during the day, at dawn and dusk, and even in the rain.

As we continue to study these unusual creatures, there is the potential for even more technological developments and benefits to humans.

### Text Questions.....

1. According to the text, what characteristics are found in "true flight"?
  - a. The animal or craft flies in a straight line.
  - b. The animal or craft requires large amounts of fuel.
  - c. The animal or craft has the ability to lift and hover above the ground without forward motion to provide these forces.
  - d. The wings of the animal or craft move constantly.
2. What does it mean to say the moth *emits* a humming noise?
  - a. It utters words.
  - b. It transmits a signal.
  - c. It puts into circulation.
  - d. It gives off sounds.
3. Why do the moths require such large amounts of food?
  - a. Their wings are in near constant motion.
  - b. They do not tolerate cold weather well.
  - c. They migrate long distances in the winter.
  - d. They do not eat very much at one time because their mouths are small.
4. What is the text structure in the second paragraph?
  - a. cause and effect
  - b. problem solution
  - c. descriptive
  - d. compare and contrast
5. How has observing nature helped humans develop new technology?