

- 1. Can honey bees hear sound?:** They do not hear sound like humans sense sound but "hear" through vibrations sensed in the Johnston's organs in the antennae.
- 2. Does the number of eggs that the queen lays vary?:** Yes, the queen lays more during late winter and early springs. She lays less eggs in the summer and may even lay no eggs in the winter.
- 3. Do the numbers change during the year?:** Yes, depending on the season. More drones in spring time. Less worker bees in the fall and winter.
- 4. How are honey bees specialized for the collection and transport of pollen?:** They have hairs on their bodies that attract pollen. They also have corbiculas, or pollen baskets, on their hind legs which the bees comb the pollen into for transporting back to the hive.
- 5. How can a drone be distinguished from other bees?:** Wider body than worker and queen and large eyes
- 6. How can a queen be distinguished from other bees?:** Longer abdomen, longer than other bees, no hair on the back of her thorax
- 7. How can worker bees be distinguished from other bees?:** Smaller than queen and drones, shorter abdomen, corbicula on hind legs
- 8. How does a queen know whether to lay a fertilized egg or an unfertilized egg?:** The queen will use the size of the cell to determine whether to lay a fertilized or unfertilized egg. If the cell is big enough to accommodate a drone, then an unfertilized egg will be laid.
- 9. How do honey bees carry nectar and water?:** Honey bees carry nectar and water in their crops which is like a pre-stomach (it cannot digest).
- 10. How do honey bees carry propolis?:** In their corbiculas.
- 11. How do honey bees produce royal jelly?:** Honey bees produce royal jelly by mixing secretions from two glands in the worker bee's head (the hypopharyngeal and mandibular glands). This super rich substance is fed to queens their entire lives and to worker and drone larvae for the first four days of the larva stage of development.
- 12. How do queens store sperm from mating?:** They store the sperm in the spermatheca.
- 13. How do the conditions under which honey bees are reared differ?:** A queen bee is fed a larger amount of royal jelly than other bees. Worker and drone larvae are fed royal jelly and then their diet is changed to bee's bread (pollen and nectar). But the queen is fed royal jelly her entire life.
- 14. How is sex determined in honey bees?:** Sex is determined by whether the egg laid is fertilized or unfertilized. A fertilized egg will become a female bee. An unfertilized egg will become a male bee (haplodiploidy).
- 15. How long does a bee live?:** - Workers reared in spring/summer live for six weeks.
- Workers reared in fall live for four to six months.
- Queens live four to five years.
- Drones live until they mate or about 90 days.
- 16. How long does it take a drone to develop into an adult?:** 24 days
- 17. How long does it take a queen bee to develop into an adult?:** 16 days
- 18. How long does it take a worker bee to develop into an adult?:** 21 days
- 19. How many eggs does a queen lay in a day?:** 1,500 to 2,000 eggs a day in peak season (late winter/early spring)
- 20. How many of each type of honey bee might you expect to find in a colony?:** - 1 queen
- 20,000 to 80,000 workers
- 5% drones
- 21. What are the lifecycle stages of the honey bee?:** The lifecycle stages of honey bees are: Egg, Larva, Pupa and Adult. A worker bee's lifecycle
- 22. What are the main functions of a queen, other than laying egg?:** She produces pheromones that regulates and creates stability in the colony.
- 23. What are the major sensory structures of the adult bee and where are they found?:** Antennae, eyes (compound and ocelli), mandibles, proboscis are located in the head. Sensory hairs are located all over the honey bee's body.
- 24. What are the three main body sections of the adult bee and how are they specialized in terms of function?:** The head, the thorax, and the abdomen. The head is the majority sensory region of the body. The thorax is the locomotor region of the body. The abdomen contains most of the internal organs.
- 25. What are the two castes found in the colony and what are their major roles (functions)?:** Worker bees forage for food, take care of the hive, the queen and the brood. Drones mate with queens.
- 26. What do bees eat and what food do they collect?:** Honey bees collect nectar and pollen. Adult bees eat nectar pollen and honey. Honey bee larvae and the queen eat royal jelly. Larvae and young workers eat bee's bread which is a mixture of nectar/honey and pollen.

27. **What happens when a bee stings?:** During the process of stinging the bee contracts muscles in its abdomen that cause the shaft of the sting to protrude from the tip of the abdomen. The bee arches the tip of its abdomen down pushing the tip of the shaft into the victim.
- The lancets have backward pointing barbs which grip the skin. The lancets move back and forth in opposite directions to each other which act to drive the sting further into the victim.
- During the stinging process muscles around Dufour's gland and venom sac contract to squeeze their contents into the bulb. The ends of the lancets that sit within the bulb draw venom into the venom canal as they reciprocate back and forth.
28. **What is the basic structure and function of the sting?:** - Sting sheath - place where the stinger is kept until it is released for stinging purposes.
- Venom gland - The gland which produces the venom that damages tissue if injected into the body.
 - Venom sac - Holds the venom produced by the venom gland, and can then contract to pump venom through the stinger
 - Dufour's gland (alkaline gland)
 - Sting shaft - made up by the bulb or stylet and two barbed lancets that surround a central canal.
 - Stylet (bulb) - contents from venom sac and Dufour's gland pumped into here and drawn by the lancets into the venom canal.
 - Valves - squeeze the venom into the venom canal.
 - Barbed stinger - the lancets used to puncture the skin and pump venom into the wound.
29. **What is the function of male honey bees and what are their development stages and times:** Male honey bees mate with queens. Their development stages are egg, larva, pupa, and adult. They take 24 days to develop into an adult.
30. **What organs are used for smell, taste, and touch?:** Antennae, eyes, proboscis, and sensory hairs.
31. **What three types of individuals are found in the honey bee colony?:** Queen, Worker and Drone
32. **What visual organs do honey bees have? Are they all capable of seeing images?:** They have two types of eyes. There are three ocelli which are the three smaller eyes at the top-center of a bee's head. They have two compound eyes on the sides of their heads which are made up of thousands of tiny lenses called facets. The ocelli do not see images, they allow the bees to use sunlight for navigation.
33. **When does a queen mate?:** During her mating flight when she is around 6 to 16 days old.
34. **Where are the queen honey bee's ovaries located?:**
Abdomen
35. **Where are the wax glands located?:** There are eight wax glands in the honey bee abdomen.
36. **Why are queens larger than workers?:** -to lay at the bottom of the cell
-spermatheca - has to hold a lifetime's worth of sperm for fertilizing eggs
37. **Why does queen size change during the year?:** If she is a virgin queen, she will be smaller since she is not mated yet. If the hive is swarming, then the queen slims down to be able to fly away with the swarm.
38. **With how many drones does a queen mate?:** On average, 12 drones but can be up to 40 drones.