Busy Bees

Workbook for 2nd & 3rd grades

Presented by St. Lucie County 4-H
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The Honey Bee

Lesson One
The Honey Bee

Honey bees are insects. They are hairy insects that are brownish-orange and black. Like all insects they have three body regions; head, thorax and abdomen. The honey bee also has three pairs of segmented legs (six legs) which are attached to the thorax; they have pollen baskets on their hind legs. Honey bees have two sets of wings (four wings) that are attached to the thorax; the fore wings are much larger than the hind wings. They have large compound eyes and three smaller eyes called simple eyes which are found above the compound eyes. The honey bee also has two antennae which are found on the head.

They are social insects that feed on pollen and nectar from plants. Honey bees are generally not aggressive and will only sting if they feel threatened. Honey bees are very important pollinators. They transfer pollen which is carried in their pollen baskets, from the male part of the flower (Anther) to the female part of the flower (Stigma) this helps to reproduce flowers and many of the foods we like to eat everyday like watermelons, blueberries, strawberries and nuts. In fact, about a third of the food Americans eat is a direct result of pollination by insects.

The Three Body Regions of the Honey Bee
The Honey Bee Quiz

1. What color are honey bees? _______________________________
   ___________________________________________________________________

2. Name the three body regions of the honey bee. _______________
   ___________________________________________________________________

3. How many segmented legs does the honey bee have? ___________
   ___________________________________________________________________

4. What can you find on their hind legs? _______________________
   ___________________________________________________________________

5. How many wings does the honey bee have? __________________
   ___________________________________________________________________

6. What are the large eyes on the honey bee called? ______________
   ___________________________________________________________________

7. Name two things honey bees feed on. _______________________
   ___________________________________________________________________

8. Why are honey bees very important? _______________________
   ___________________________________________________________________

9. Name the male and female part of the flower._________________
   ___________________________________________________________________

10. Name one of the foods honey bees help to reproduce.__________
    ___________________________________________________________________
The Honey Bees Home

Honey bees live in large family groups called colonies. Honey bees tended by beekeepers live in wooden boxes called hives.

The colony only has one queen bee; she is the largest of the honey bees. She has a longer abdomen and does not have pollen baskets on her hind legs. She can lay up to 2,000 eggs a day. She never leaves the hive except to mate.

Worker bees perform all the jobs in the hive and are always female; they are the smallest of the honey bees. They tend to and feed young bees (larvae). They make honey, beebread which is a mixture of nectar and pollen and royal jelly which is milky, yellow syrup that is very high in protein. The young worker bees secrete it from their glands inside their head and feed it to the larvae. Worker bees also produce wax, guard the hive, build, clean and repair the comb (the six-sided wax cells in a beehive), gather and store pollen, nectar and water and take care of the queen and the drones (male bees). If a worker bee stings you it will die.

The male members of the colony, the drones, are somewhat larger and only make up five percent of the hive population. They have rounded abdomens, huge compound eyes, and powerful wings. Their only purpose is to mate with the queen bee. They are considered the “couch potatoes” of the hive. They are fed by the worker bees.

The Honey Bee Colony

Queen (female)  Worker (female)  Drone (male)
Draw a picture of one of the bees from the colony; Queen, Worker or Drone

Remember the Queen has a longer slightly wider abdomen than the worker and the Drones have wider bodies and their abdomens are rounded rather than pointed and have huge compound eyes.

This is a ____________________________ bee
The Honey Bees Home Quiz

1. What name is given to large groups of honey bees? ________________
   ______________________________________________________________

2. What name is given to the wooden box where honey bees can live?
   ______________________________________________________________

3. There is always only one of these types of bees in the honey bee colony.
   ______________________________________________________________

4. How many eggs can a queen bee lay in one day? ________________
   ______________________________________________________________

5. What name is given to the bees that do all the work in the hive?
   ______________________________________________________________

6. Name one thing the worker bees make? ________________
   ______________________________________________________________

7. Name one other job the worker bees do in the hive? ________________
   ______________________________________________________________

8. Who do the worker bees take care of in the hive? ________________
   ______________________________________________________________

9. What will happen to the worker bee after she stings you? ______
   ______________________________________________________________

10. What name is given to the male members of the colony? ______
    ______________________________________________________________
The Life Cycle of the Honey Bee
Lesson Three
The Life Cycle of the Honey Bee

Like many insects, honey bees go through four stages of development: egg, larva, pupa, and adult. The process is called complete metamorphosis, which means that the form of the bee changes drastically from larva to the adult.

The queen bee inserts her abdomen into an empty cell and lays a soft, white, oval egg about the size of a dot over an “i”

Eggs develop into different types of bees based on what they’re fed, and whether or not they were fertilized. The fertilized eggs become female worker bees and new queens. The queen can also lay some unfertilized eggs, which produce the drones.

The Queen Bee and Her Eggs
The Larvae Stage

The egg hatches into a **larva** after three days. The larva is a legless grub that looks like a tiny white sausage. The larva is fed by worker bees and grows much larger. If the larva is going to become a queen bee it is fed royal jelly for the entire larval stage. Worker bee larvae are fed royal jelly for three days then they are fed bee bread for the remaining larval stage. Drones (male bees) are also fed royal jelly for three days and then fed bee bread.

The Larvae
The Pupae Stage

On day ten, the cell the larva is inside is capped with wax by a worker bee to protect it. The larva stops eating and spins a silk covering called a **cocoon** around itself. Inside the cocoon, a **pupa** develops and begins to look more like a honey bee than a worm. It grows eyes, legs and wings. On the twenty first (21st) day an adult bee chews its way out of the cell.

The Pupa Inside the Cell Developing into an Adult Honey Bee
Life Cycle of the Honey Bee

1. The queen lays a single **egg** in each cell.

2. The egg hatches into a white, legless **larva**.

3. The larva feeds on beebread until it reaches a mature size.

4. When the larva becomes a **pupa**, worker bees cap the cell.
“BEE SMART” WORD SEARCH

Find the words that have to do with honey bees. You can read forward, backward, up, down and on a slant. Good Luck!

V B N E L L O P D A N H I
Q F T Z W F P O I S T E E
M L R F E O G N Q K N F P
W O R K N S M T A U B X L
C W S E I H A N V B E N L
K E R W D I G R Y Z A E E
H R J O N V A H I C T S N
Y A K S H E L C H O N E Y
O K E Q U E F T I B B V W
L C U M D T W O R K E R N
T F L O W P R S V A E B H

BEE  INSECT  FLOWER  HIVE  HONEY  POLLEN  QUEEN  WORKER
The Life Cycle of the Honey Bee Quiz

1. Name the four stages of development the honey bee goes through

______________________________________________
______________________________________________

2. What name is given to the changes the honey bee goes through?

______________________________________________

3. What color are the eggs the queen bee lays?

______________________________________________

4. What type of honey bee comes from a fertilized egg?

______________________________________________

5. What type of honey bee comes from an unfertilized egg?

______________________________________________

6. The egg hatches into which stage after three days?

______________________________________________

7. What does the larva look like?

______________________________________________

8. If the larva is going to become a queen bee what is it fed?

______________________________________________

9. What name is given to the silk covering the larva spins around itself?

______________________________________________

10. What stage develops inside the cocoon?

______________________________________________
Honey Bee
Communication
Lesson Four
Honey Bee Communication

Honey bees communicate about the location of food with each other by **dancing**. After a honey bee has found food she tells the other bees in the hive the location of that food source through a dance language.

The **scout bees** are the ones responsible for flying around looking for these food sources. The bees from the hive smell and taste the nectar the scout bee is carrying to tell what type of flower she has visited.

When the scout bee returns to the hive she will dance on the **honeycomb**; she performs a dance by running in a precise pattern that communicates the direction and distance of the flowers to the other bees.

There are several bee dances, but the most common are the **round dance** and the **waggle dance**.

When the food is close to the hive she will perform the round dance. She goes round and round, first one way and then the other. Fellow worker bees must fly out of the hive in many directions looking for the flowers (food) as the round dance does not show the exact location.
**The Waggle Dance**

If the flowers are more than a hundred (100) yards away from the hive, the bee will return and perform the waggle dance. The bee dances a half circle in one direction, she then turns and runs straight while wagging her abdomen from side to side. Then she will dance a half circle in the other direction. These two half circles form a figure eight. Depending how much nectar she found, the figure eight may be repeated several times, especially if she found a lot. The speed of the dance and the amount of buzzing made by the dancing bee will show how far away the food is from the hive. The faster she dances, the closer the food.

The scout bees are also responsible for locating new sites for their colony. They will communicate to the hive when they have found a new site; this is usually done when they are swarming. Only a few bees go out to find suitable locations. Once located, they indicate to the other bees what has been found and where it is.
Dancing Bees

Honey bees tell each other things by dancing. The dances tell worker bees where to find food.

This bee has lost her dancing friends! Help her find her way to the flower.
Honey Bee Communication Quiz

1. How do honey bees communicate the location of food to each other?

2. What name is given to these bees that locate the food?

3. How can the bees from the hive tell what type of flower the scout bee has visited?

4. What will the scout bee dance on?

5. Name the two most common dances?

6. What type of dance will the scout bee perform if the food (flowers) is close to the hive?

7. What type of dance will the scout bee perform if the food (flowers) is more than a hundred (100) yards away from the hive?

8. Name another job the scout bee performs?
Africanized Honey Bees

Lesson Five
Africanized Honey Bees

Africanized honey bees got their name because they originally came from the continent of Africa. They look just like honey bees, only an expert can tell the difference between them. They are also similar in that they can only sting once; pollinate flowers; sting in defense of themselves or their nests and produce honey and wax. Africanized honey bees will live just about anywhere there is shelter. They can be found in trees, old abandoned appliances, junk piles, storm drains, sheds, under rocks, in abandoned vehicles, lawn equipment left in the yard, in the sides of buildings, in drain pipes, water meters and even holes on the ground. Be very careful around these possible nesting sites. They can be very defensive if you are too close to their hive. They respond more quickly than honey bees and in greater numbers, which may mean more bee stings.

It is very important that you be aware of your surroundings and stay alert when you are playing and making noise outdoors. Walk away and stay away when you see a bee nest or a lot of bees swarming, always let an adult you know as soon as possible. Remember if you see a bee on a flower, don’t panic, it is working to gather pollen and nectar. It is not likely to sting you unless you mess with it.

If you get chased by bees, the most important thing to do is RUN away as fast as you can. Do not try to fight the bees, the more you flail your arms the madder they will get. Just run indoors as fast as possible and tell an adult. Any covering for your face and head will help you escape such as a handkerchief or mosquito net device or even a towel. The worst place to be stung is your face and eyes as it stops you from seeing where you are running to. If nothing else, pull your shirt up over your face. The stings you may get on your chest are less serious than the ones on your face. Take refuge in a house, tent or a car with the windows and doors closed. Do not jump into water! The bees will wait for you to come up for air.

Always remember to:
Bee Aware...Look, Listen and Run!
WHERE ARE THE AFRICANIZED HONEY BEE NESTING SITES?

Africanized honey bees are wild and pick many different places to live.

List the places where Africanized honey bees might like to nest:

1. 
2. 
3. 
4. 
5. 
6. 
7. 
8. 
9. 
10. 

Where might this Africanized honey bee swarm settle?
Africanized Honey Bee Quiz

1. What continent did Africanized Honey Bees come from? ________
   ________________________________________________________________

2. Name some places Africanized Honey bees can be found:
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________

3. What should you do when you see a bee’s nest or a lot of bees swarming?
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________

4. If you get chased by a bee what is the most important thing to do?
   ________________________________________________________________

5. Where should you run to if you are being chased by bees?
   ________________________________________________________________

6. Name something you can use to cover your face with if you are being chased.
   ________________________________________________________________

7. Always remember to:
   ________________________________________________________________
Additional Activities
Constructing a Honey Bee Body

Materials

1. A copy of Honey Bee pattern
2. Dark orange or orange construction paper. You can color over the orange construction paper with a brown crayon to get the burnt orange color needed for the bee’s body.
3. White construction paper or typewriter paper (for wings)
4. Gray or black construction paper, or pipe cleaners (for antennae and/or legs)
5. Black marker, glue stick, scissors and stapler

Procedure:

⇒ Cut out all eight parts of the honey bee from the Honey Bee Pattern to use as templates

⇒ Trace the head, thorax and abdomen body parts on to the orange construction paper

⇒ Cut these parts out and glue the pieces so the thorax overlaps the abdomen by about 1/3 inch and the head overlaps the thorax the same amount

⇒ Trace the fore wing and the hind wing twice onto the white paper

⇒ Cut out the two sets (4 total) wings and glue them on to the thorax of the bee; with the smaller hind wing under and behind the larger fore-wing

⇒ Trace the legs twice (6 total) onto the gray/black construction paper
⇒ Cut out the legs (6) and glue 3 on one side of the thorax and 3 on the other side of the thorax, opposite each other

⇒ Trace the antennae twice (2 total) onto the gray/black construction paper

⇒ Cut out the antennae and glue them to the head of the bee

⇒ Color in a few bands around the abdomen, starting about halfway down and filling in the entire end portion.

⇒ Draw compound eyes on the head with the black marker.

⇒ Include simple eyes, pollen baskets, veins on the wings, and the stinger, to make more lifelike bees.
Making cells and a comb activity

Materials

Construction paper (4 different colors to represent eggs, larvae, pupae and honey)
Scissors
Markers
Glue
Bulletin board or butcher paper

Procedure

⇒ Cut out the pattern for cell as part of a comb from the next page
⇒ Use this template to draw around on the construction paper given to you
⇒ Write your name on it
⇒ Attach your polygon to the butcher paper making sure the sides are together.
⇒ The cells containing eggs, larvae and pupae should be grouped together in the middle and the cells containing the honey will be towards the outside
PATTERN FOR CELL AS PART OF A COMB