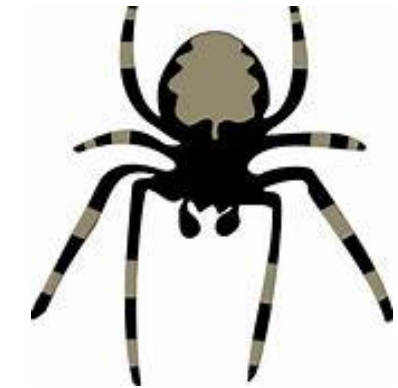


Busy As a Bee

Honeybee Society



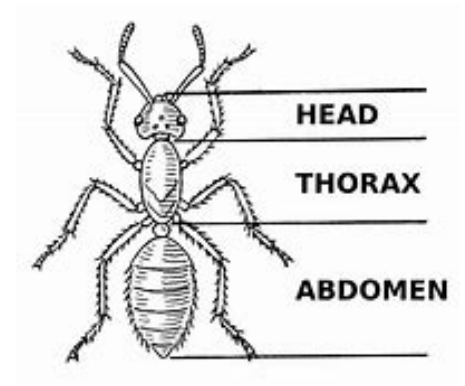


Bees are insects
and insects are
arthropods.

- Arthropods include insects like ants and bees, arachnids like spiders, myriapods like centipedes, and crustaceans like pill bugs.
- Tap your forehead, elbow, knee. Can you feel the hard bone under your soft skin? Those bones are part of our skeletons that give structure to our bodies. Our skeletons are inside our skin.



- Arthropods have exoskeletons; that means that their skeletons (hard structures) are outside their bodies like a suit of armor. Their exoskeletons are made of a cellulose like material, chitin, and minerals.



- They also have bodies in segments (parts) and jointed (like our knee or shoulder) legs. There are appendages (like our legs and arms) or body parts, attached to the segments.



Bee anatomy

Bees are insects.

They have three body parts—head (touching head), thorax (touching chest), and abdomen (touching tummy).

The wings (flapping hands) and 6 (3 fingers each hand) legs are attached to the thorax where the muscles are.

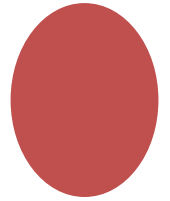


Bees have two big eyes (2 fists) called compound eyes made up of lots of little eyes called ommatidia, and 3 small simple eyes (three fingertips) called ocelli.

Bees have 2 antennae (2 fingers by forehead).



Bees have an exoskeleton—a skeleton on the outside (tapping forehead elbow, knee).





- 2 antenna

- 1 head

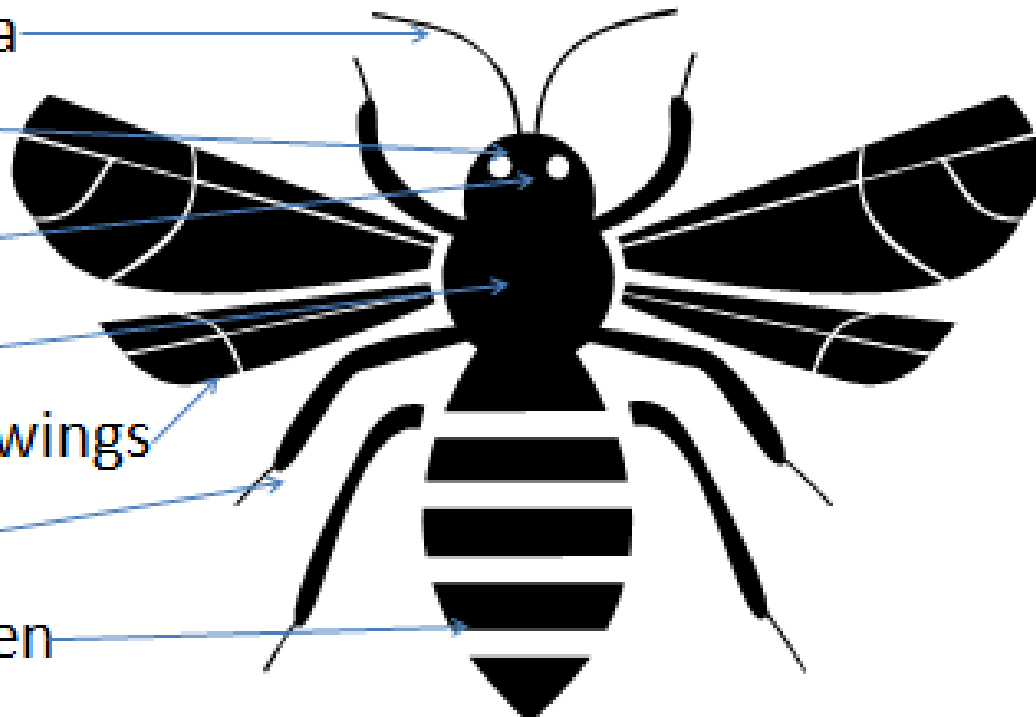
- 2 eyes

- 1 thorax

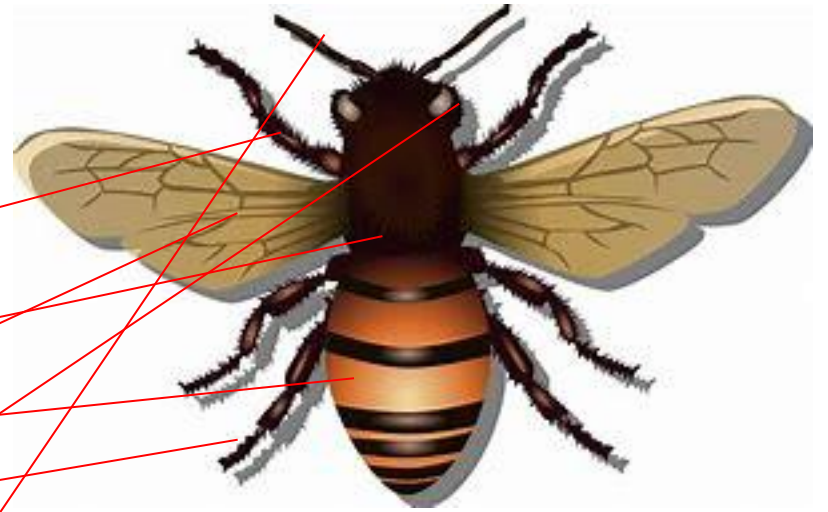
- 2 sets of wings

- 6 legs

- 1 abdomen



You can be BEE anatomy! You
can sing this song to *Head, Shoulders, Knees
and Toes*.



Head, thorax, abdomen, abdomen 2x
(touch head, chest, tummy)

6 legs, some wings and exoskeleton

(3 fingers each hand, flap hands on shoulders, go head to toes both hands)

Head, thorax, abdomen, abdomen.

Head, thorax, abdomen, abdomen 2x
(touch head, chest, tummy)

Big eyes, small size and 2 antennae too

(2 fists, pointer fingers together, pointer fingers on head)

Head, thorax, abdomen, abdomen.

Growing Up WILD

Bees have
specialized
body parts
for honey
collecting.

The pollen basket collects the pollen.
Honey is stored in the honey stomach.



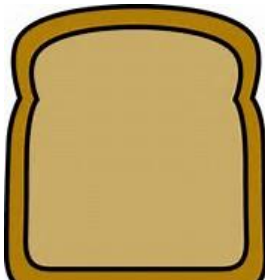


Bees make
three kinds of
foods.



Bee milk is made from
glands in the bees' heads
and is fed to the very young
larvae.

Bee bread is made from
pollen mixed with honey
and is fed to the worker and
drone brood. It is full of
protein.



Royal jelly is a kind of extra
rich bee milk fed to the
queen.

How does nectar become honey?

Bees collect nectar from flowers. Nectar is 80-95% water.

They also collect pollen in their pollen baskets, and while they are collecting, they are pollinating flowers.

Honey is about 18% water.

When the bees return to the hive with the nectar, they pass it from bee to bee (trophallaxis) and fan it with their wings and gradually the water is reduced, and more sugar remains.

They store the honey in the hexagonal (6 sided) cells in the honeycomb.

Bees make beeswax by eating honey and using special abdominal glands to secrete liquid wax that hardens into tiny scales.



There are different tools for separating and lifting frames.

- Hive
- Comb
- Honey tool
- Hive smoker
- Bee keeping clothing
- Brush



Hive boxes have several levels.

The bottom board is at the bottom with the hive stand.

The hive body has the frames for the colony.

The honey super is above the hive body and holds the honey for extracting.

The cover is on the top.



What do we use to extract and process the honey?

First you use the smoker to calm the colony and your hive and frame tools to remove a frame.

The heated knife and uncapping fork unseal the cells.

The frame goes into the extractor which spins out the honey from the cells.

You pour the honey through a double sieve to catch any wax and let it sit to get air bubbles out, before you pour it into jars or bottles.





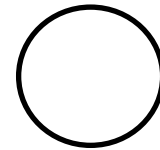
Honeybees are social insects. They live in a group called a colony. At different ages worker bees have different roles. Queen bees lay the eggs. Drones help make the babies.

Honeybee roles include nurse bees that take care of the larvae, housekeeping bees that clean the cells, construction bees that help build the honeycomb, foraging bees that gather pollen and nectar, and guardian bees that protect the hive. Having different roles by age is temporal polyethism.

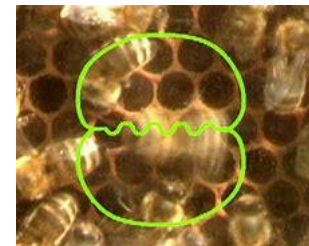


Honeybees use dances to communicate where to find nectar and pollen.

When the source of nectar and pollen is close the bee dance looks more like a circle with the bee shifting clockwise and counterclockwise and is referred to as the round dance.



When the source is farther away the dance is called the waggle dance and looks more like a figure **8** with the speed and direction of the waggle indicating both distance and direction.



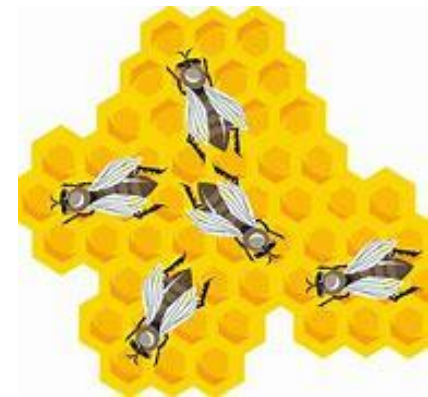
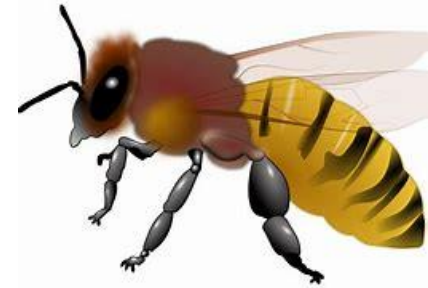
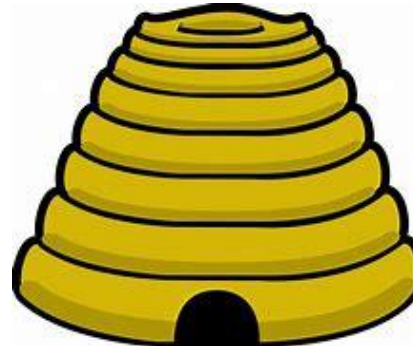
You can be Finger Bees!

Here is the honeybee. (pincer finger thumb)

Here is the hive. (tent hands)

Working together (mesh fingers)

To keep bees alive! (clap)



You can sing this song to *Jingle Bells*.

Honeybee, funny bee,

Flying by my nose, (touch nose)

Honeybee, funny bee,

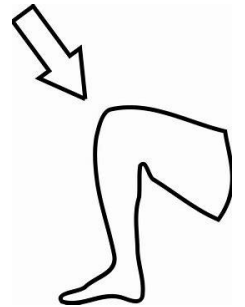
Flying by my toes. (touch toes)

By my head, by my knees, (touch head, knee, elbow)

And also, my elbows.

Honeybee, funny bee

Around and round, she goes. (hand in a circle)



Based on:

BUSY BEEKEEPING

Beekeeping is busy busy!



Bee clothing

Beekeepers



Bees are social insects with different roles. They live in a colony in the hive.



The hive box has several stories and contains the frames of honeycomb..



Each frame contains a wax honeycomb.



The honeycomb is the substrate for brood cells, pollen, nectar and honey storage.



The hive
tool is
used to
separate
the
frames.



The smoker calms the bees so the frames can be handled safely. The smoke masks alarm pheromones.

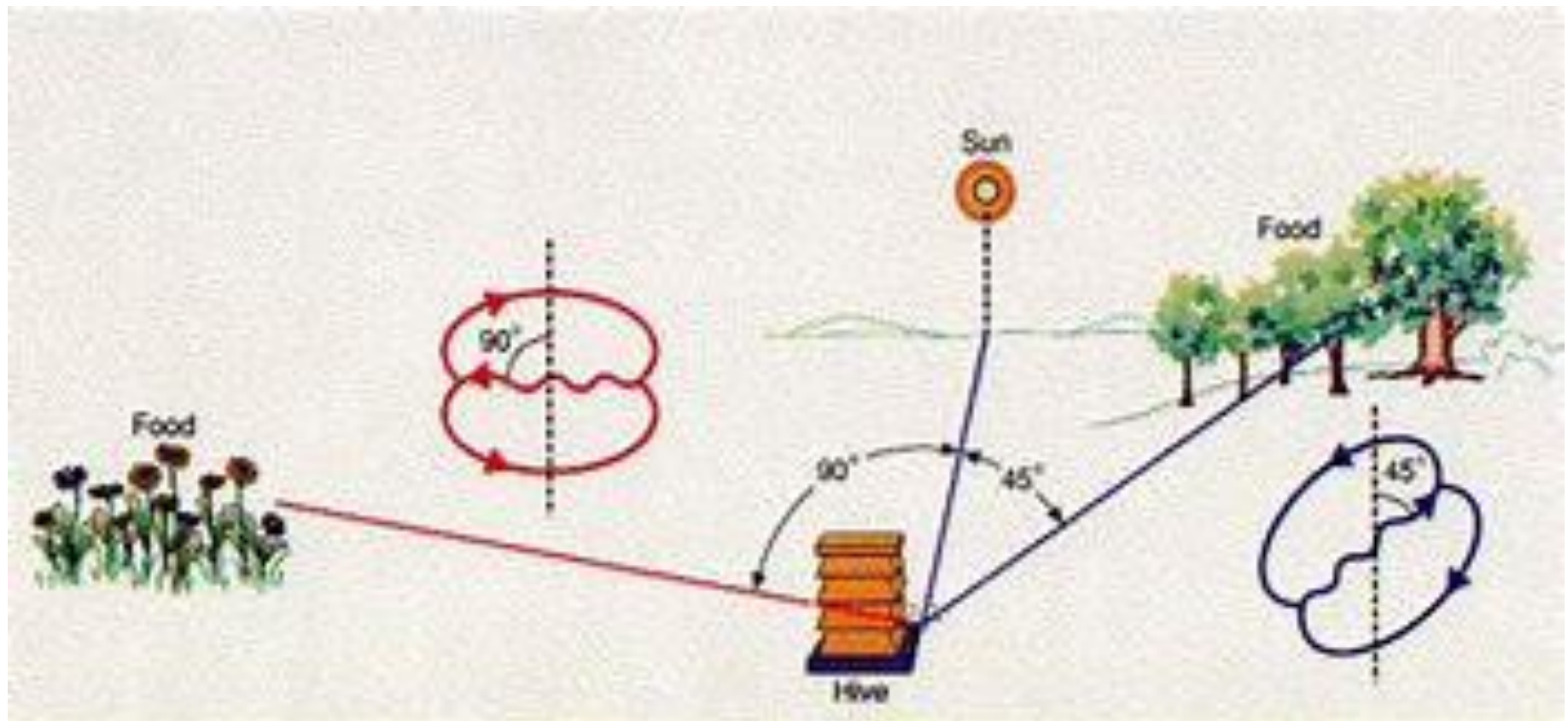


The brush is used to brush the bees off the extracted frame.



You can do the waggle dance!

Dance in a figure 8 waggle as you cross and then waggle in the direction of the flowers. Waggle fast if it is close; the longer the waggle, the farther away. A lively dance means good quality food. The optic flow of the image while flying allows the bee to estimate distance.



Art for little hands

You can make a beehive from play dough and a cup.

Roll the yellow model magic into a snake and coil it around the cup.



Be a Bee Motel Architect!

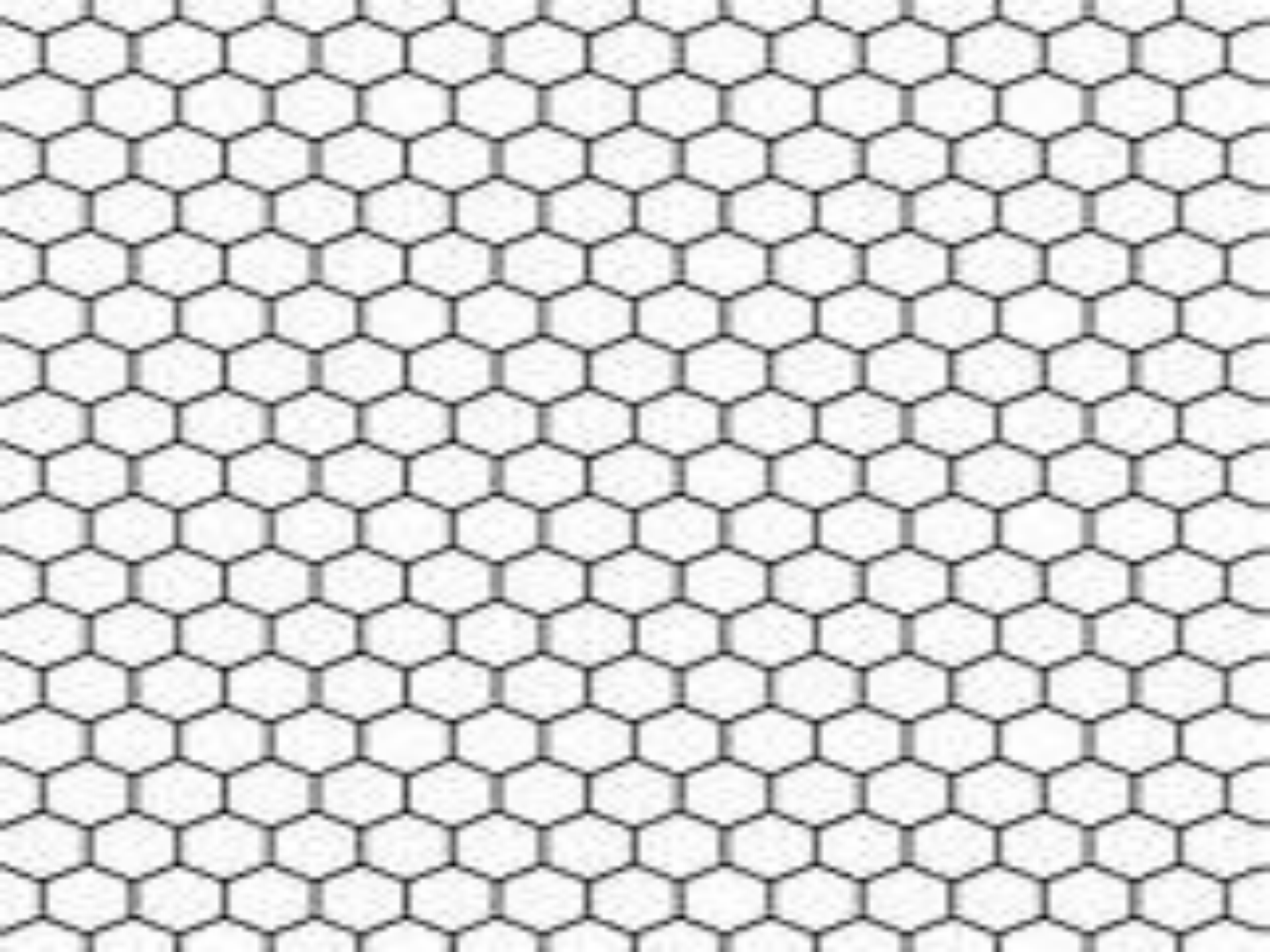
Most bees do not live in hives. Most bees are solitary. You can build a bee house or bee motel for a solitary bee. The photo includes some sample paper rolls, and papers to make more rolls for a bathroom tissue roll, and a paper towel with plastic straws. In general, paper is better than plastic. You place the rolls in the tube. The tubes go into a container—a cannister or milk jug or large milk carton. The end must be closed.

See the 2 tubes. One has straws so you can see how you can rubberband the straws and fit them in the tube; you would need many tubes filled with straws and a container the same length. See the short tube, sample paper straws, and paper cut to the matching length if you want to practice making paper straws for a bee motel. You can put lichen and twigs and moss around straws or tubes to fill the tubes or the container.

You can be Bee Architects!

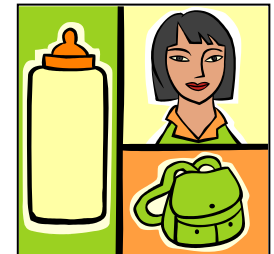
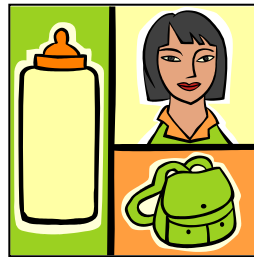


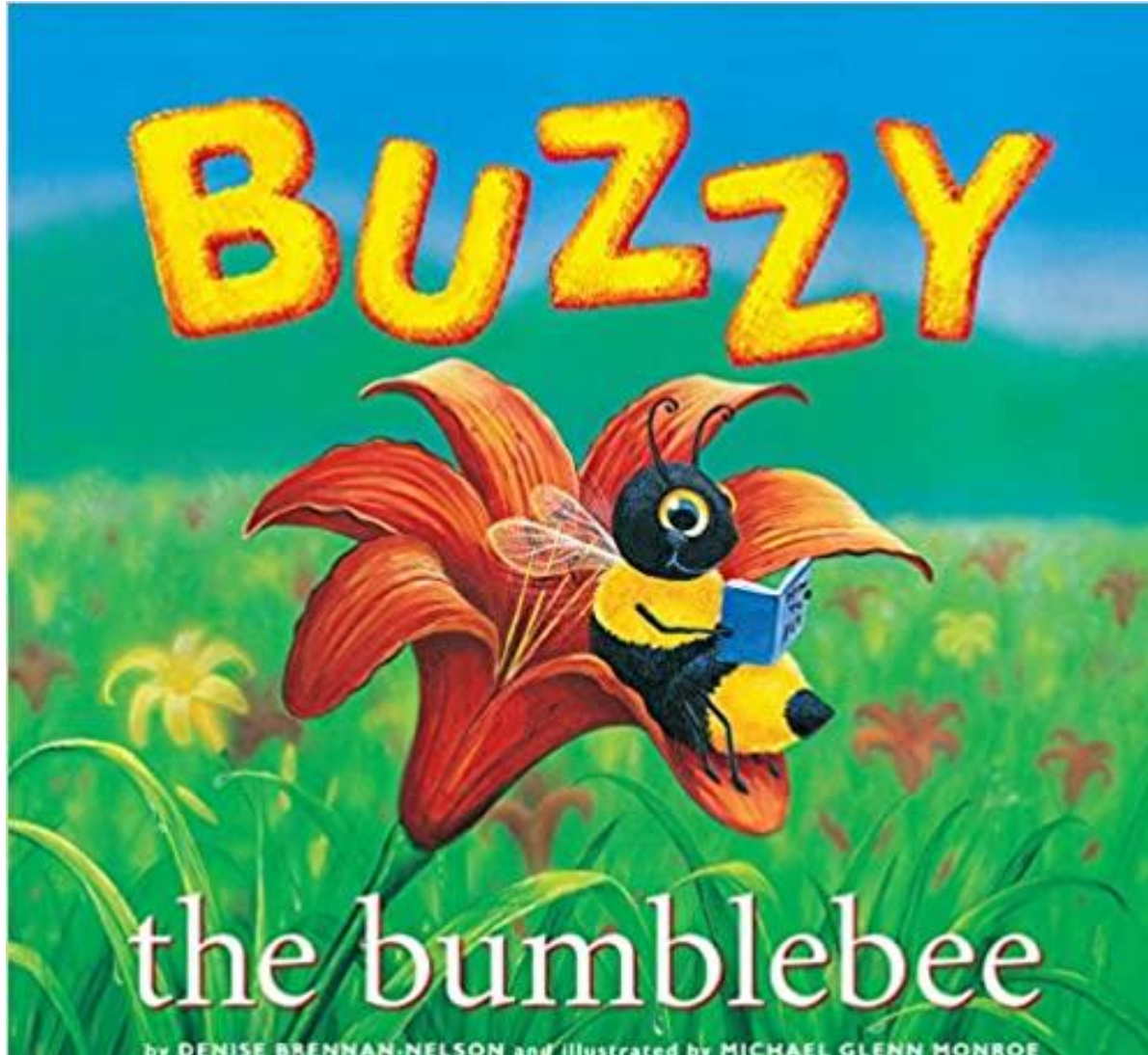
Make a house for a bee!



Bee roles—janitor, cook, nanny, protector, builder, food collector,
queen, drone=daddy

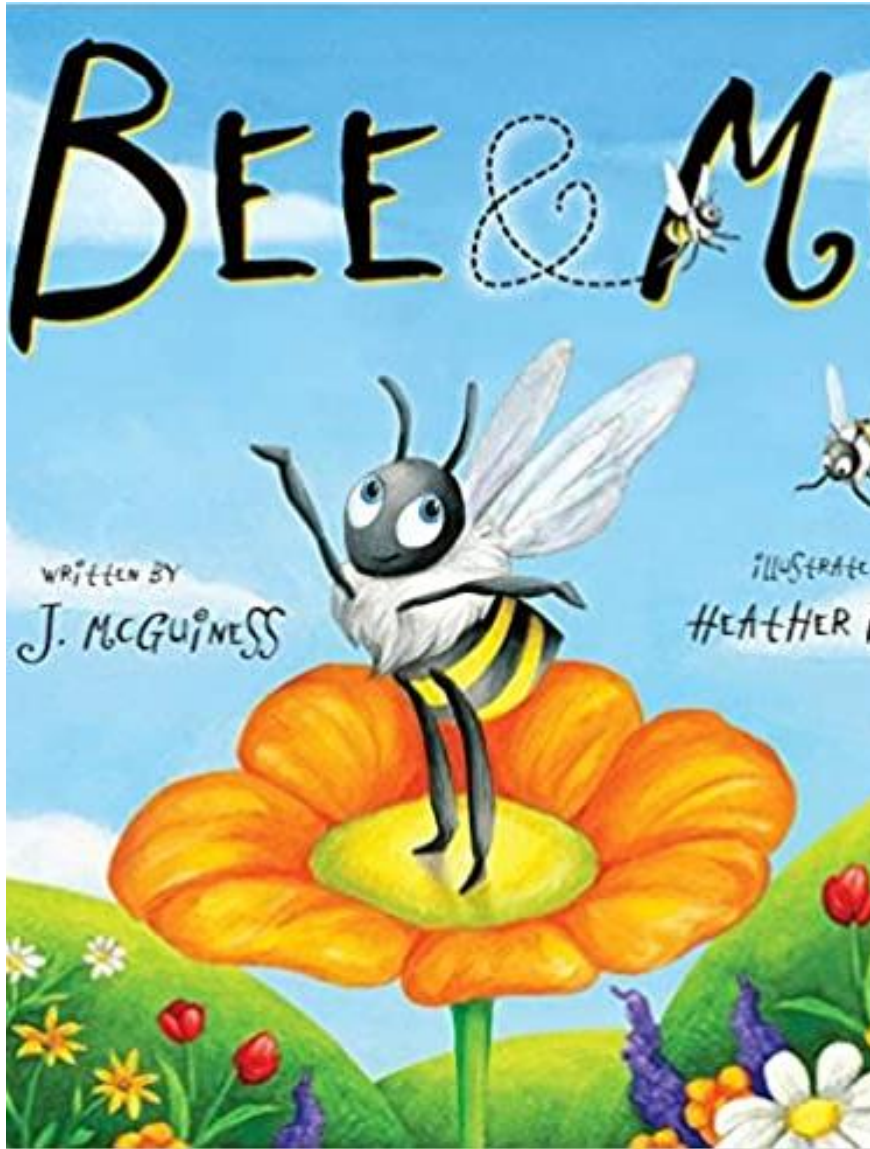
You can paste the bee roles and bees onto the honeycomb!





In this story
Buzzy can't fly
because a book
said
bumblebees
don't fly; he
learns to solve
problems and
believe in
himself.

<https://www.youtube.com/watch?v=HsiC1RN73f8>



https://www.youtube.com/watch?v=V2_zrmWpflo

In this story a little boy learns how important bees are.