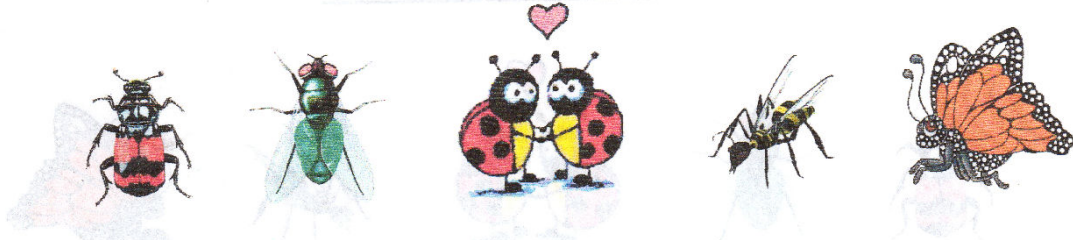


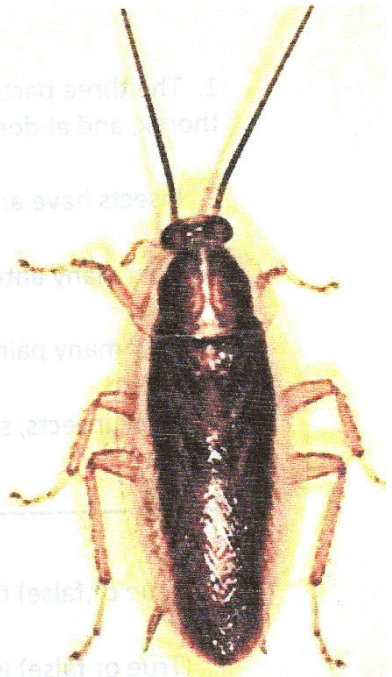
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INTRODUCTION TO INSECTS

Introduction to Insects



- The number of insect species is believed to be between six and ten million.
- Insect bodies have three parts, the head, thorax, & abdomen.
- Insects have a hard outer shell called an exoskeleton.
- Insects have two antennae.
- Insects have three pairs of legs.
- Some insects, such as water striders, are able to walk on the surface of water.
- Bees, termites and ants live in well organized social colonies.
- Only male crickets chirp.
- Insects are cold blooded.
- Silkworms are used as the primary producer of silk.
- Most insects hatch from eggs.
- Some cicadas can make sounds nearly 120 decibels loud.
- The life cycle of a mosquito features four stages, egg, larva, pupa and adult.
- Female mosquitoes drink blood in order to obtain nutrients needed to produce eggs.
- Spiders are not insects.
- Bees are found on every continent except Antarctica.
- Ants leave trails and communicate with each other using pheromones as chemical signals.



OPTIONAL WEBSITE ACTIVITIES BELOW:

What is an insect? Great youtube video for K/1 students--

<https://www.youtube.com/watch?v=DUPXkWgC1aA>

The Very Hungry Caterpillar by Eric Carle narration-- Youtube video. This is a very popular, fun story just for fun. Great for K/1 students

<https://www.youtube.com/watch?v=4HI7q38VmQ>

Insect sounds—try the cricket, grasshopper, cicada, night insects, honeybees and more. <http://www.naturesongs.com/insects.html>

Questions on Introduction to Insects page

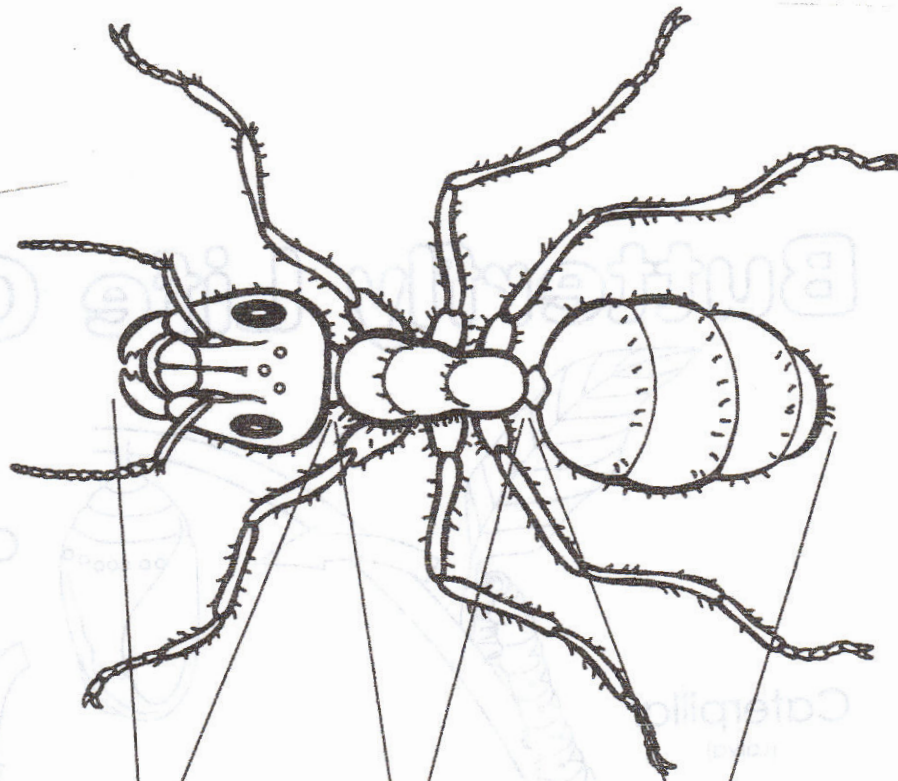
Homework



1. The three parts of an insects body are _____, thorax, and abdomen.
2. Insects have an outer _____ called an exoskeleton.
3. How many antennae do insects have? _____
4. How many pairs of legs does an insect have? _____
5. Some insects, such as water striders, have the ability to do what? _____

6. (True or false) Only female crickets chirp. _____
7. (True or false) Insects are warm blooded. _____
8. Most insects hatch from what? _____
9. (True or false) spiders are insects. _____
10. What is the fourth stage of the life cycle of a mosquito?
 - egg
 - larva
 - pupa
 - _____

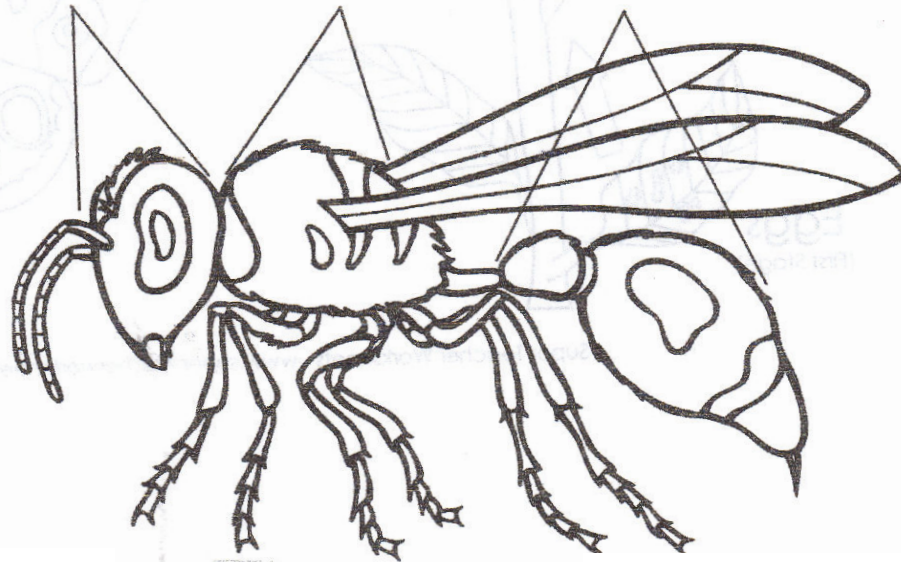
Insect Anatomy Worksheet



Head

Thorax

Abdomen



Head

Thorax

Abdomen

Painted Lady Butterfly Metamorphosis



The Painted Lady butterfly larva you are receiving today is contained in a cup with enough food to enable it to reach the pupa stage. Simply place the cup in an area where it will receive indirect light (DO NOT place them in direct sunlight) Maintain a temperature of 68 to 78 degrees F. You will need a large glass jar with a lid for the pupa stage. In 5 to 10 days, the larva will climb to the top of the cup and form a pupa, known as a chrysalis.

When the caterpillar first emerged from its eggshell, it probably ate the eggshell before beginning to feed on its host plant. Painted lady butterflies enjoy thistle plants, so the mother probably laid her eggs on a leaf of this plant. Your larva is being fed a man made food mixture just right for painted ladies. As the caterpillar eats, it grows and the exoskeleton cannot stretch with this continuing growth. From time to time, it must shed its "skin". The caterpillar makes a pad of silk on which to grab with its prolegs. A new layer of skin develops under the existing layer. When ready, the caterpillar swallows air to expand its body and to split open the old skin. It then wiggles free of the old skin. This old skin will look like a black prickly dot in your cup. After it has taken time for the new skin to harden, it will resume eating. Butterflies usually molt 5 times and these stages are called instars. Your larva has probably already molted several times by the time you receive it.

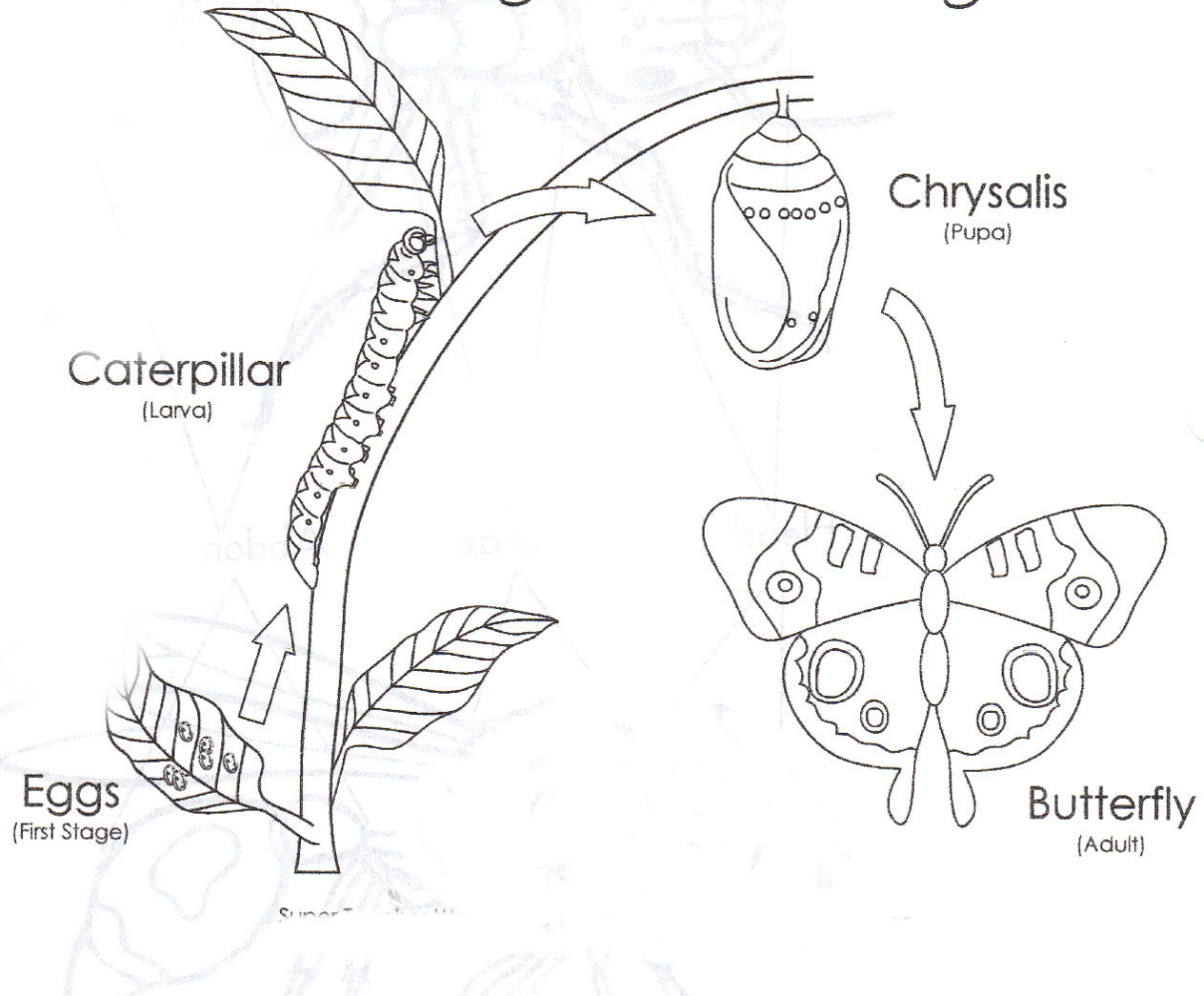
The final molt of the caterpillar is when it forms a chrysalis. The caterpillar stops feeding and moves to the top of your cup and attaches itself to the tissue lining with a pad of silk, and holds on with its prolegs. Once again the old skin splits open revealing this time the new skin of the chrysalis (this is absolutely amazing --- try hard to witness this!!!) The end of the chrysalis, known as the cremaster, has hooks that the chrysalis uses to hold onto the silk pad. As the chrysalis wiggles, the old skin usually drops off, but it may get pushed up and remain. Some chrysalises remain suspended, while some produce a silk girdle used to hold the chrysalis upright. The chrysalis is vulnerable until the new skin hardens. The butterfly usually remains in this stage for 7-10 days.

Once your caterpillar pupates (becomes a chrysalis), do not disturb it for 2 days to allow it time to harden. After 2 days, carefully open your cup and remove the tissue with chrysalis attached, taping it to the top of a lid to a bigger jar. The pupa needs more space so that the beautiful Painted Lady Butterfly has enough room to emerge and dry its wings unhindered. Misting the jar lightly occasionally helps the chrysalis from drying out.

During the pupa stage, the butterfly completes its transformation. It does not eat nor excrete waste while a pupa. When complete, the pupa skin opens and the adult butterfly crawls out. You may notice a red liquid on the tissue paper or on the bottom of the jar when the butterfly emerges. Do not be alarmed. This is not blood, but meconium – a waste product of the butterfly. At this point, the wings of the butterfly are folded. The adult remains suspended and begins to pump fluid into the veins of the wings to make them expand, then harden, and the adult is ready for flight. The adults do not have chewing jaws as the caterpillars did, and cannot eat leaves. Instead they have a coiled straw like tongue called a proboscis used to siphon nectar from flowers. You may feed your butterfly a sugar/water solution by mixing 2 teaspoons of sugar with 1 cup of water. They often use their feet to sense for nectar and you may see them touch the sugar water with their feet before extending their tongues to drink. Once your butterfly has emerged, you may release it right away.

Enjoy this beautiful creature that God has made!

Butterfly Life Cycle



Honey Bee Reading

Honeybees are social insects. They depend on one another for survival. Bees live in groups called colonies. A colony can have tens of thousands of bees. There is only one queen in each colony. She is the mother of the colony, laying more than 1,800 eggs a day. She has to lay that many eggs, because workers bees only live a few weeks during honey-making season in the spring and summer.

Bees make honey from nectar. Nectar is a sweet liquid found inside flower blossoms. The bees collect the nectar and carry it to the colony in pouches within their bodies. The secret ingredient that turns nectar into honey is bee “spit.” Chemicals in the bees’ saliva help change the nectar into sugars. The nectar/saliva mixture is then stored in the beeswax comb by the workers. The younger bees fan the nectar with their wings until much of the water has evaporated. Then they put wax caps on it and save it to eat in the winter. Beekeepers harvest honey just like any other crop. When they take honey from a hive, they are very careful to leave enough so the bees can survive the winter.

One bee would have to make 154 trips, carrying tiny amounts of nectar from the flower to the hive, just to make one teaspoonful of honey. If one bee had to make a pound of honey all by herself, she would have to spend 160,000 hours and make 80,000 trips. That would be the same as flying around the world three times. One worker bee actually makes only one twelve of a teaspoon of honey in her lifetime. But working together, a colony of bees may bring in as much as 50 pounds of nectar in a day and make 200 or 300 pounds of honey in a year.

Honeybees communicate through their movements. They attract the attention of other bees and let them know where to find nectar, using movements that look like a dance. The movements show the other bees which way to go and how far. The bees usually move in the form of a figure eight. Slow dancing means the nectar is far away. Fast dancing means it is nearby.

Beeswax comes out in white flakes from glands under the bee's abdomen. The wax is white at first but gradually turns a golden color. About 8 million pounds of beeswax is used in the US each year. People use beeswax to make candles, lipsticks, lotions, shoe polish, crayons, chewing gum, and floor wax. In the past sculptors used bleached bee's wax to hide mistakes in their sculptures. The best sculptors were proud to say their statues were "sine cera," or without wax. That is where we get the word "sincere."

When one bee colony gets too crowded the bees split up and start a new colony. The workers begin to raise a new queen. When it is almost time for the new queen to hatch, the old queen will gather several thousand bees to go away with her. This is called "swarming." The bees fly in circles around the queen until she lands. The other bees land around her, clinging to each other in a great heap. When the swarm has settled it sends out scouts to find a new home. When bees are swarming, they will not attack, because they have no home to protect.

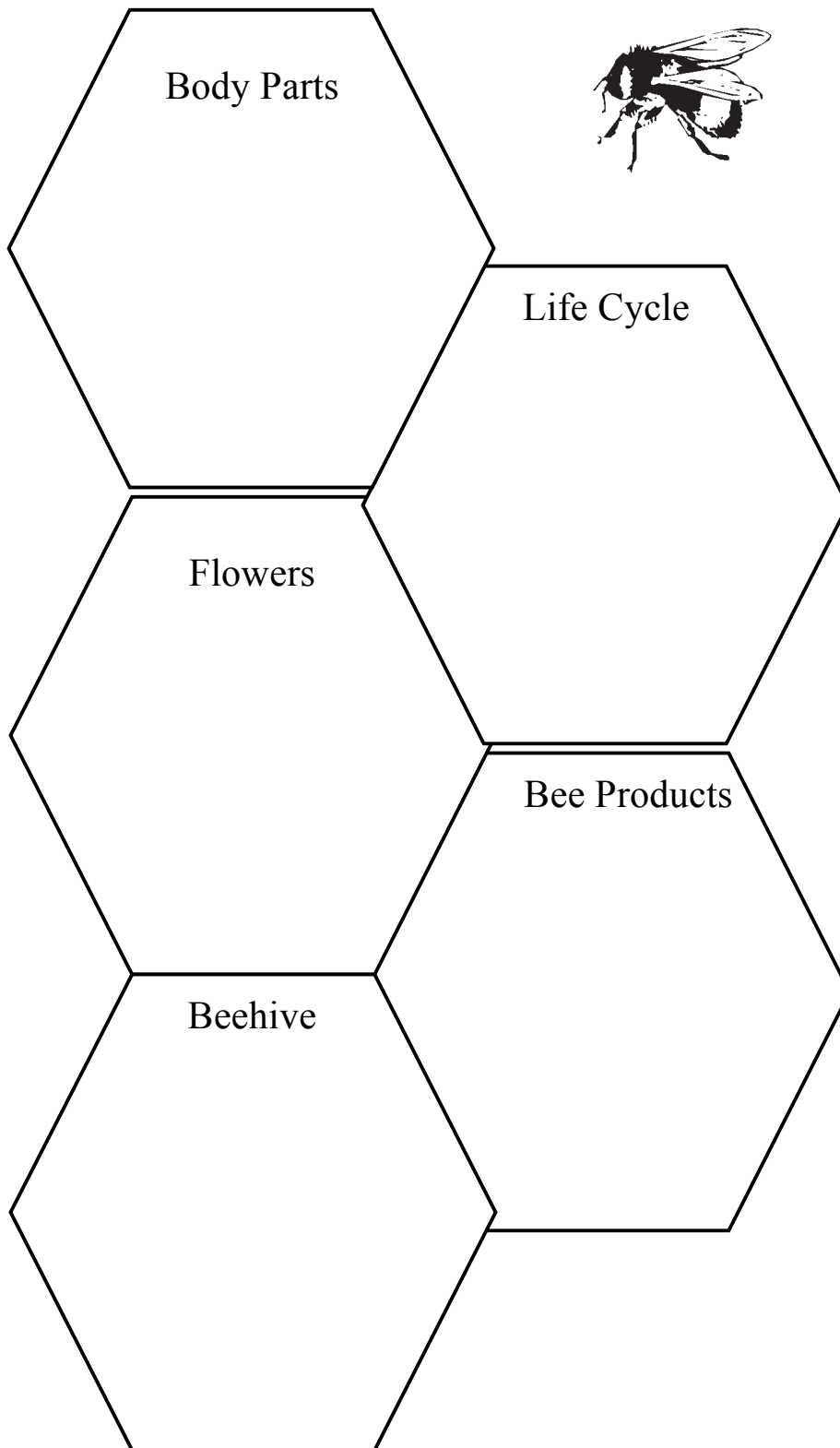
Honeybees will sting only if they are frightened or harmed. If you are stung you should remove the stinger immediately by scraping it off with a fingernail or any straight-edged instrument. Do not try to pull it out, because this will force more venom into your skin. A worker bee will die a few hours after stinging, because the stinger has a barb at the point which the bee can- not pull out once it is stuck in your skin.

Honeybees are very important to the farmer. Before any kind of plant can produce fruit, its flowers must be pollinated. Bees pollinate flowers as they fly from one to another, gathering nectar. Pollen is sticky and clings to the honeybee's body. When the bee flies to the next flower, the pollen will rub or fall off. In places where there aren't enough pollinating insects, growers sometimes bring in bees to do the job for them. If all the honeybees disappeared, about one-third of all the foods we eat today would disappear as well.

Compiled and written by Mariah Telfer-Hadler of Busy Barns Farm.

Name: _____

Honeycomb Categories

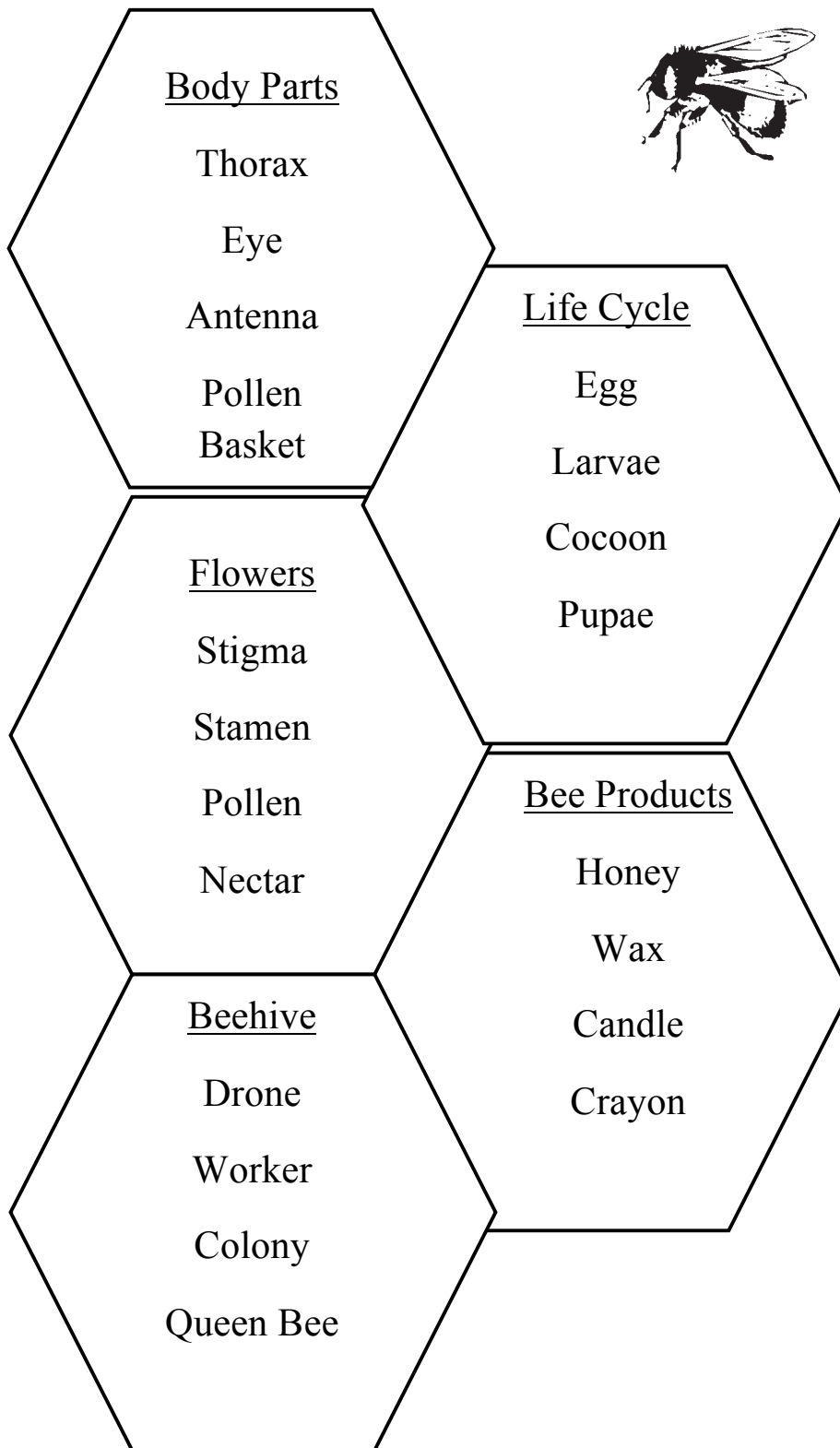


Honeybee Vocabulary:

POLLEN	THORAX	POLLEN BASKET
HONEY	WAX	ANTENNA
COCOON	COLONY	EGG
DRONE	WORKER	CANDLE
NECTAR	STIGMA	STAMEN
PUPAE	EYE	CRAYON
QUEEN BEE	LARVAE	

Name: _____

Honeycomb Categories - KEY



Ant Facts for Kids



- There are more than 12,000 species of ants all over the world.
- An ant can lift 20 times its own body weight. If a second grader was as strong as an ant, she would be able to pick up a car!
- Some queen ants can live for many years and have millions of babies!
- Ants don't have ears. Ants "hear" by feeling vibrations in the ground through their feet.
- When ants fight, it is usually to the death!
- When foraging, ants leave a pheromone trail so that they know where they've been.
- Queen ants have wings, which they shed when they start a new nest.
- Ants don't have lungs. Oxygen enters through tiny holes all over the body and carbon dioxide leaves through the same holes.
- When the queen of the colony dies, the colony can only survive a few months. Queens are rarely replaced and the workers are not able to reproduce.
- Although ants are frustrating when they get into your home or when you're having a picnic, ants do help the environment. They are social insects, which means they live in large colonies or groups. Depending on the species, ant colonies can consist of millions of ants.
- There are three kinds of ants in a colony: The queen, the female workers, and males. The queen and the males have wings, while the workers don't have wings. The queen is the only ant that can lay eggs. The male ant's job is to mate with future queen ants and they do not live very long afterwards. Once the queen grows to adulthood, she spends the rest of her life laying eggs! Depending on the species, a colony may have one queen or many queens.
- Ant colonies also have soldier ants that protect the queen, defend the colony, gather or kill food, and attack enemy colonies in search for food and nesting space. If they defeat another ant colony, they take away eggs of the defeated ant colony. When the eggs hatch, the new ants become the "slave" ants for the colony. Some jobs of the colony include taking care of the eggs and babies, gathering food for the colony and building the anthills or mounds.



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***"Go to the ant, you sluggard!
Consider her ways and be wise.
Which, having no captain, overseer or ruler,
Provides her supplies in the summer,
And gathers her food in the harvest." (Proverbs 6:6-8)***

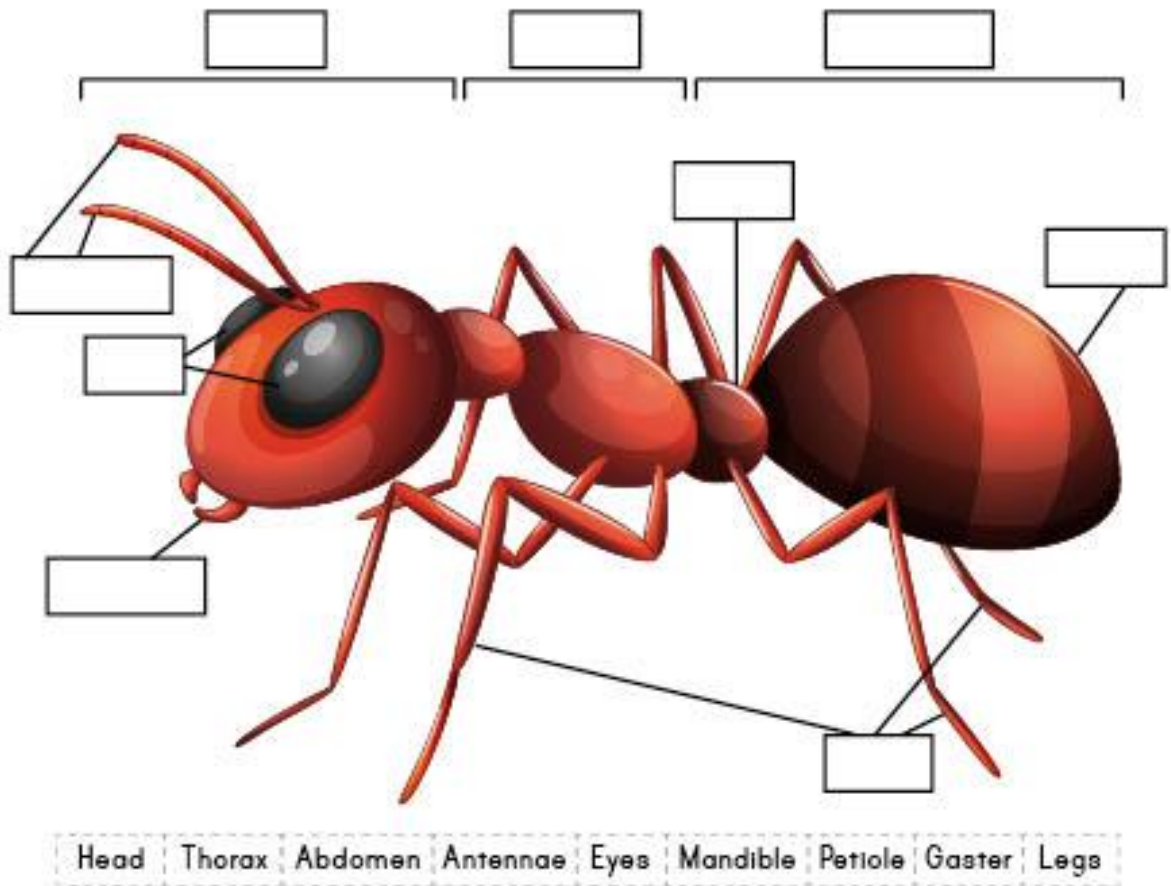
ANTS

THREE PARTS OF AN INSECT: HEAD, THORAX, ABDOMEN

MANDIBLE—MOUTHPARTS

PETIOLE—NARROW PART OF THE ABDOMEN

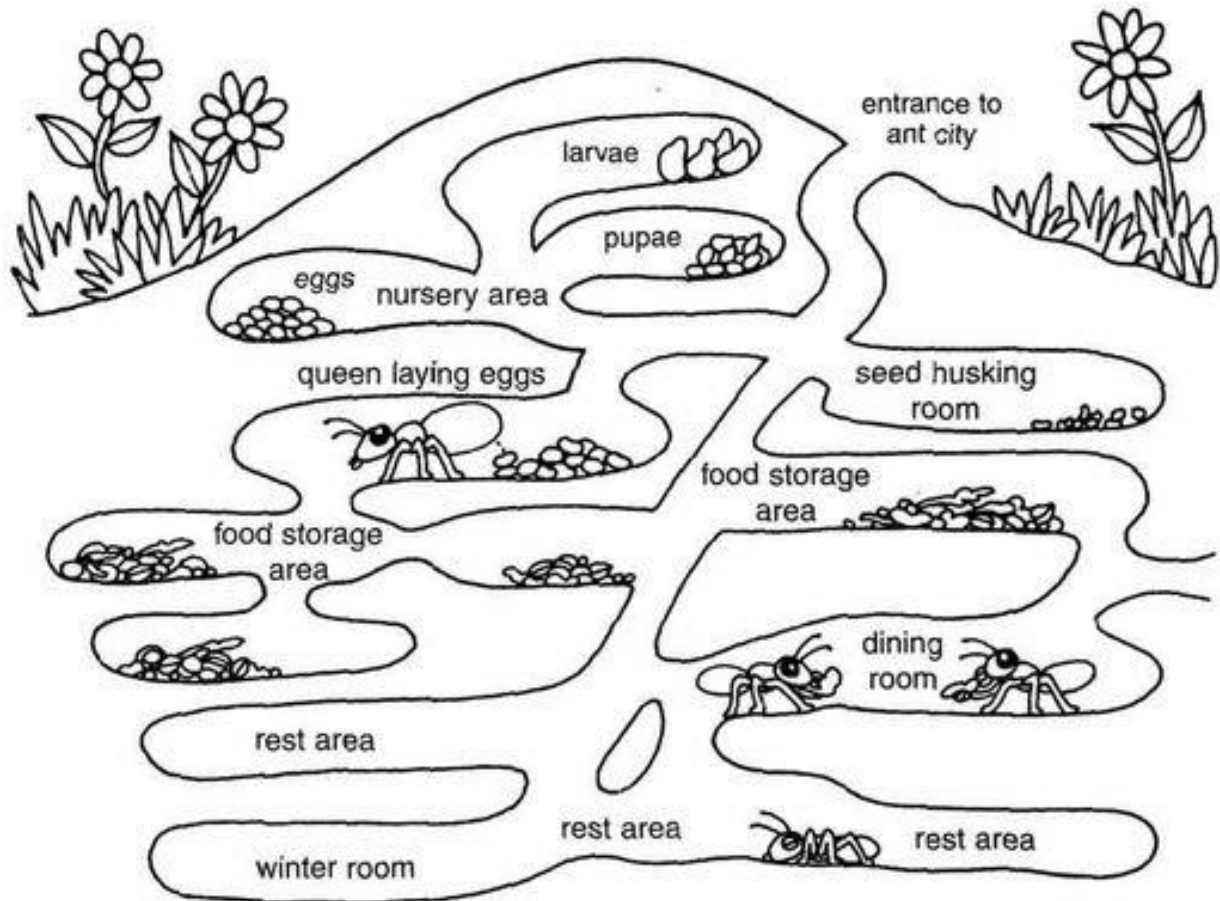
GASTER—ENLARGED PART OF THE ABDOMEN



**Ant Anatomy
Cut & Paste Worksheet**

Ant City!

Have you ever wondered what it looks like inside an ant hill? You will get an idea from studying this cutaway diagram.



Use this color key to color the rooms of this ant hill.

yellow	nursery area (eggs, pupae, larvae)	blue	rest area	orange	food storage area
purple	winter room	green	seed husking room	red	dining room

Think about it: Why do you think the nursery is at the top of the ant city and the winter room is at the bottom?
