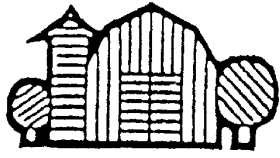
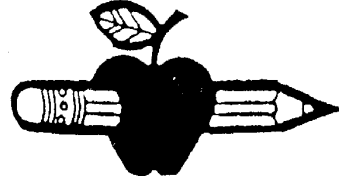


COUNTRY

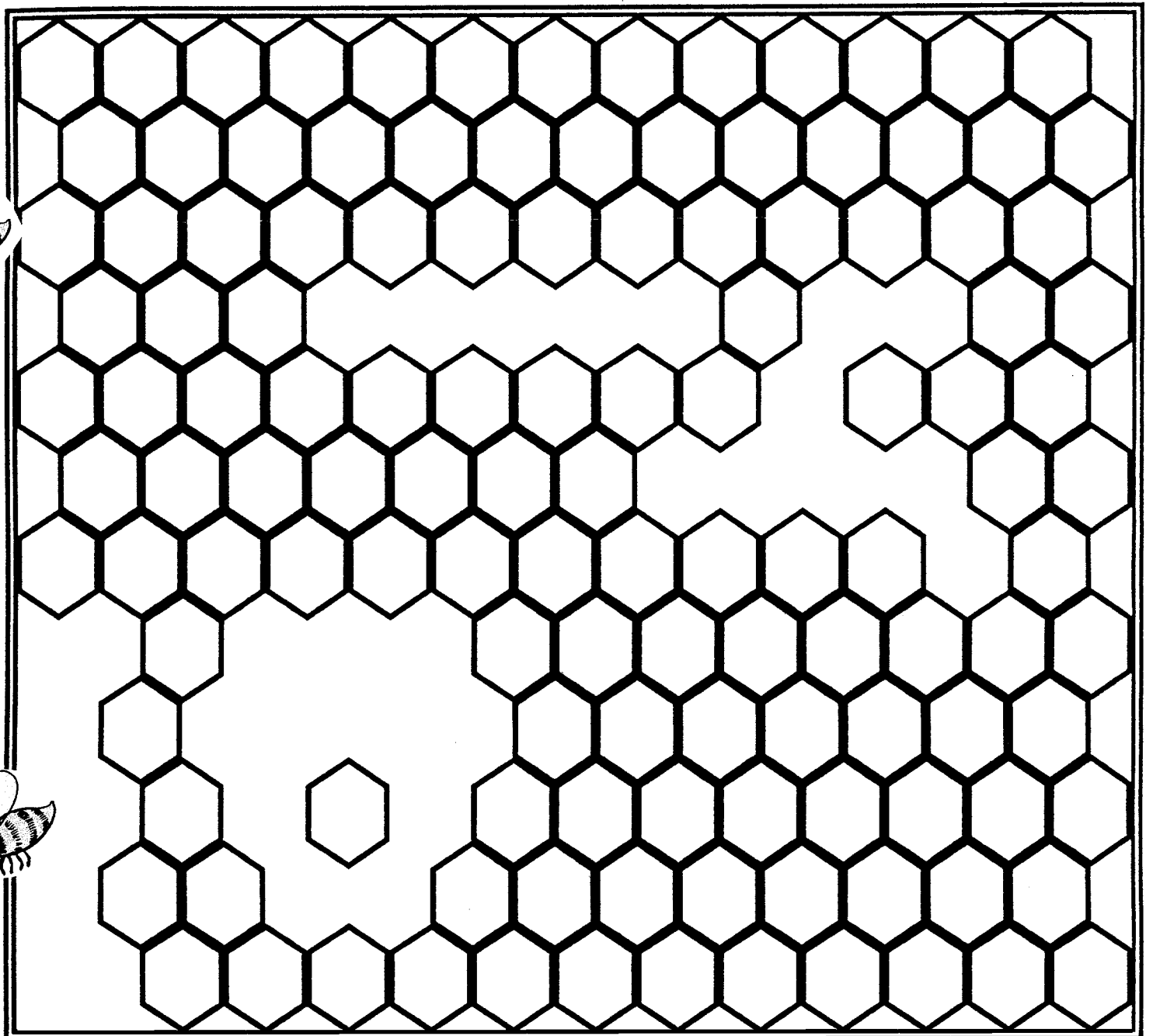
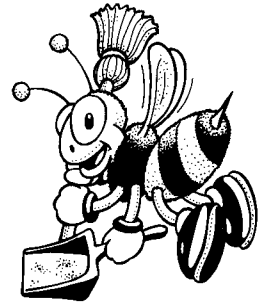
to



Classroom



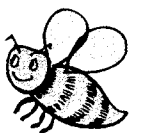
BUSY AS A BEE.....



Complete this frame of hexagons (six-sided cells). Estimate how many cells make up this honeycomb, then count the cells.

Estimated number: _____

Actual number: _____



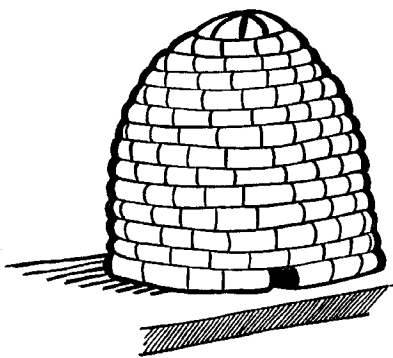


When we see a bee buzzing around us, we usually want to get away from it before it stings us. Bees may not have a good reputation because of their ability to sting, but did you know that bees are important and beneficial to the production of our food?

Everyday about one-third of the total human diet is derived directly or indirectly from insect-pollination plants. An estimated 80% of the insect crop-pollination is accomplished by the honeybee. As you guessed by now in this issue we are going to learn more about the amazing bee. Let's get started.

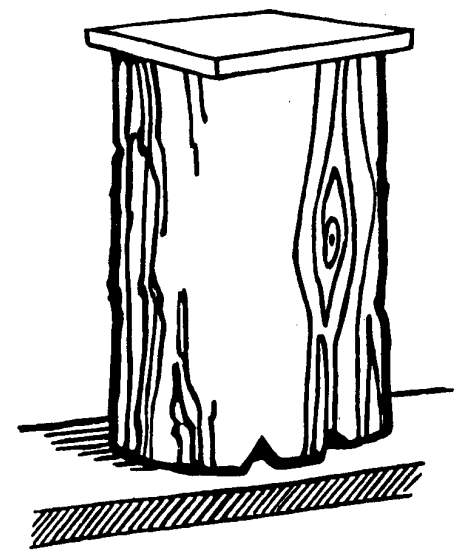
History of Beekeeping

Beekeeping began some 15,000 years ago as recorded for us through primitive cave drawings and rock paintings. The primitive beekeepers would rob bees for their honey by locating a bee nest in hollow trees and then they would burn the bees so they could take their honey. These early beekeepers also found many uses for the bees honeycomb which is where bee wax is found. Can you think of some uses primitive people used bee wax for? We still use some of their discoveries today...like candles and salves.

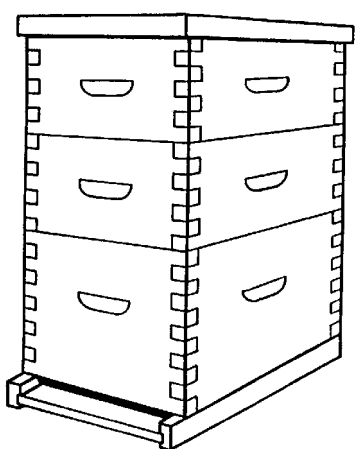


Early man-made beehive called a skep.

Early beekeepers in Europe tried to domesticate the honeybee with little success. This was the first attempt to make bees stay in a hollow log known as a bee gum. With the use of bee gums the beekeeper was able to harvest the extra honey without killing the bees. The bee gum, however, was hard to pull honey from. These early beekeepers were able to manipulate the bees to store honey in a skep (early man-made beehive). The skep made it possible to extract honey without killing the bees. This technique allowed the bee colony to produce honey for several seasons.

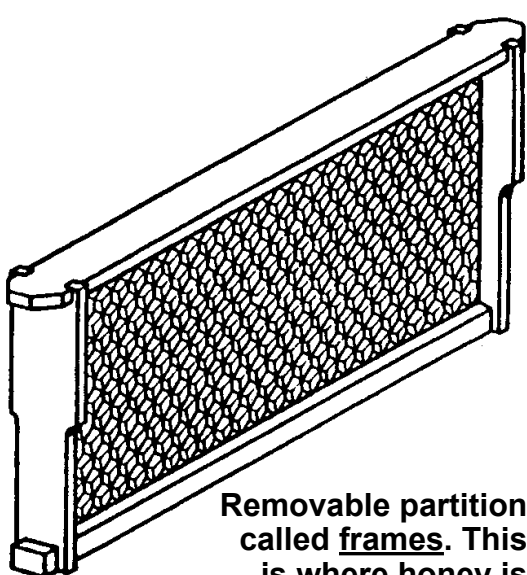


Europeans kept their bees in log hives called bee gums.

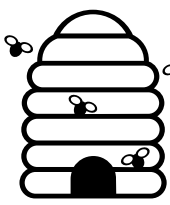


Modern wood frame hive box. Used throughout the United States.

Honeybees were brought to United States by the early settlers. However, the first honeybee introduced in the Americas was by the Spanish settlers when they were settling in Mexico. The Native Americans called this new kind of insect "The White Man's Flies." As years went by, many designs of hives were tried in attempt to provide room for more bees to live, more room for honey and pollen storage. One of the major invention was the bee box hive. This allowed the beekeeper to put more than one hive on top of the other to provide much more room for the young bees (brood) and to store more honey, nectar, and pollen. One of the problems the early settlers had was a decrease in the bee population caused by a disease called American Foulbrood. In 1882, Moses Quinby and in 1887 the Reverend Lorenzo Langstroth invented removable partitions called frames which fit inside the bee box. Frames allowed the beekeeper to inspect and care for his or her hives more efficiently which aided in the detection and control of American Foulbrood. Honey production was once again quickly increasing as bee populations rapidly increased.



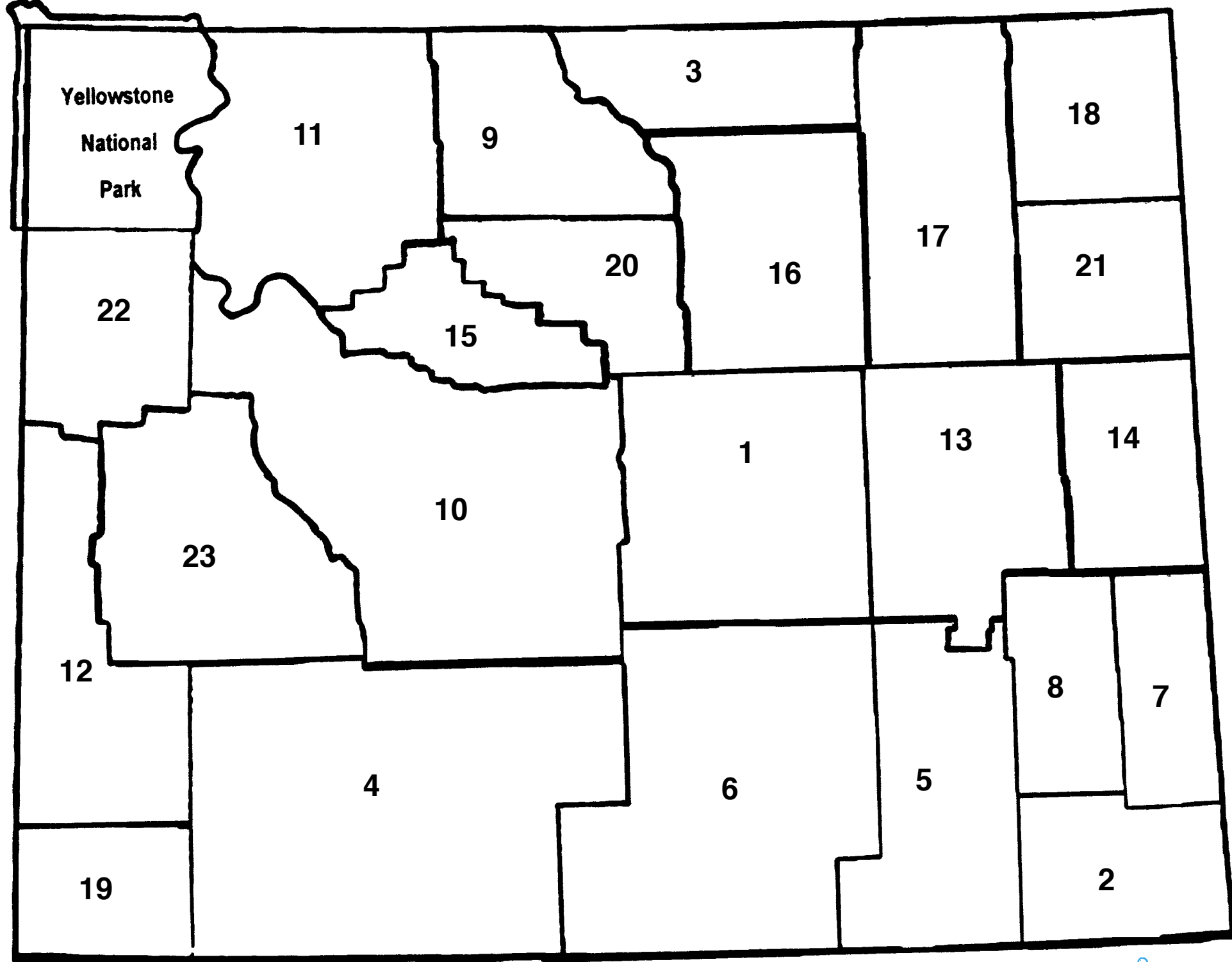
Removable partition called frames. This is where honey is stored.



Today Wyoming has approximately 50,000 colonies of bees. A colony is a community of several thousand worker bees, drones, and one queen bee. Below is a map of Wyoming with the counties licence plate in the county. Match the counties listed below with the map of Wyoming. Write in the map the number of colonies located in each county.

Licence Plate #	Counties Name	Colony Numbers	Licence Plate #	Counties Name	Colony Numbers	Licence Plate #	Counties Name	Colony Numbers
5	Albany	211	15	Hot Springs	945	3	Sheridan	5,764
9	Big Horn	3,991	16	Johnson	2,146	23	Sublette	380
17	Campbell	602	2	Laramie	293	4	Sweetwater	1,218
6	Carbon	1,359	12	Lincoln	1,536	22	Teton	299
13	Converse	2,198	1	Natrona	2,409	19	Uinta	827
18	Crook	3,478	14	Niobrara	116	20	Washakie	785
10	Fremont	9,718	11	Park	3,590	21	Weston	109
7	Goshen	1,651	8	Platte	1,646			

Numbers are courtesy of the Wyoming Department of Agriculture from 2000 data.



What County do you live in? _____
 How Many Colonies of Bees are located in the county that you live in? _____
 What is the licence plate number in your county? _____



Honey Word Scramble

exabews _____
 nlocoy _____
 carten _____
 uqene eeb _____
 eihe _____

Using the words in the **Honey Word Scramble** find the definition of the words and write the definitions in the space below.

1. _____
2. _____
3. _____
4. _____
5. _____



Bee Biology

There are over 25,000 species of bees that have been identified in the world, with more species yet to be identified. In the continental United States scientists have found approximately 3,500 species of bees. In Wyoming there are two important species of bees, one is the honey bee and the other is the alfalfa leafcutter bees. Honeybees are located in all counties of Wyoming and the alfalfa leafcutter bees are found where there is a large production of alfalfa mainly around Powell and the Big Horn Basin.

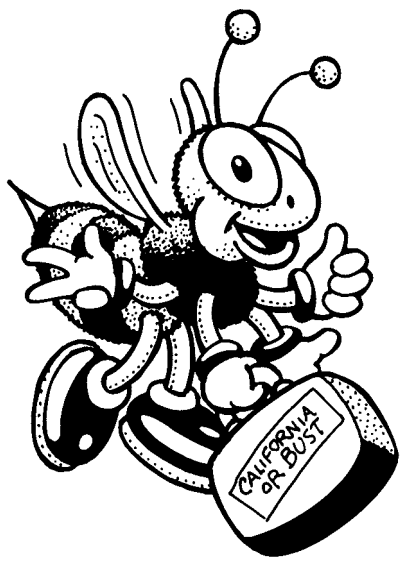
Some bees are known as solitary bees - each bee lives and works alone. The bumblebee and the honeybee, however, are called social insects because they live in groups (called colonies) and share the work. A honeybee colony is like a huge family with 40,000 to 60,000 members.

There are three kinds of honeybees in every hive, the queen, the worker and the drone.

The queen is the most important member of the colony and there is only one queen in a colony. The queen bee is slightly larger than a worker bee, with a longer abdomen. The adult queens responsibility is to lay eggs, up to 2,000 a day! She is fed by the workers and never leaves the hive except to mate. On average, queen bees live for about two to three years, although some have been known to survive for up to six years.

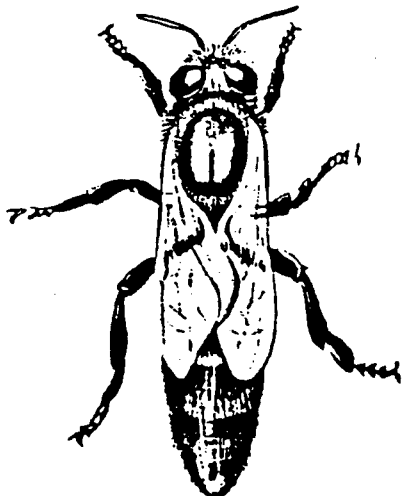


The vast majority of adult honey bees in any colony are female worker bees. The jobs of the worker bees are: tending and feeding young bees (larvae), making honey, making royal jelly and beebread to feed larvae, producing wax, cooling the hive by fanning wings, gathering and storing pollen, nectar and water, guarding the hive, building, cleaning and repairing the comb, and feeding and taking care of the queen. WOW...a worker bee is very busy. The life of a worker is short. On average they live six to eight weeks, during the summer months.

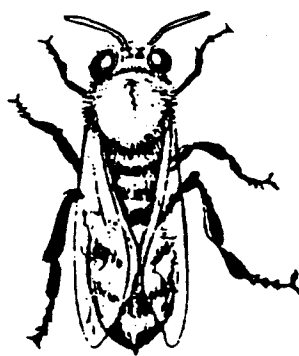


The male member of the colony, the drones, are somewhat larger and make up only about 5% of the hive population. In comparison to worker bees, drones have wider bodies (sometime called a fat body) and their abdomens are rounded rather than pointed. Drones do not have stingers. The drone's main job is to mate with the queen bee. The drones are tolerated in the hive only during the mating season or until the main honey flow is over, when the worker bee expels them from the hive. The drone is considered very lazy and does not work in the hive.

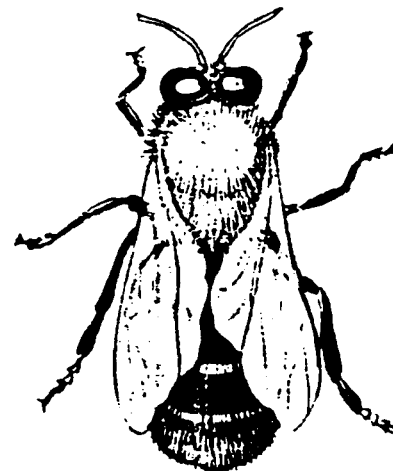
Name the three types of bees.
Use the words from the box below. Draw a line to match the bees.



I AM THE MOST IMPORTANT BEE IN THE COLONY



I AM VERY BUSY



I AM VERY LAZY

WORKER

DRONE

QUEEN



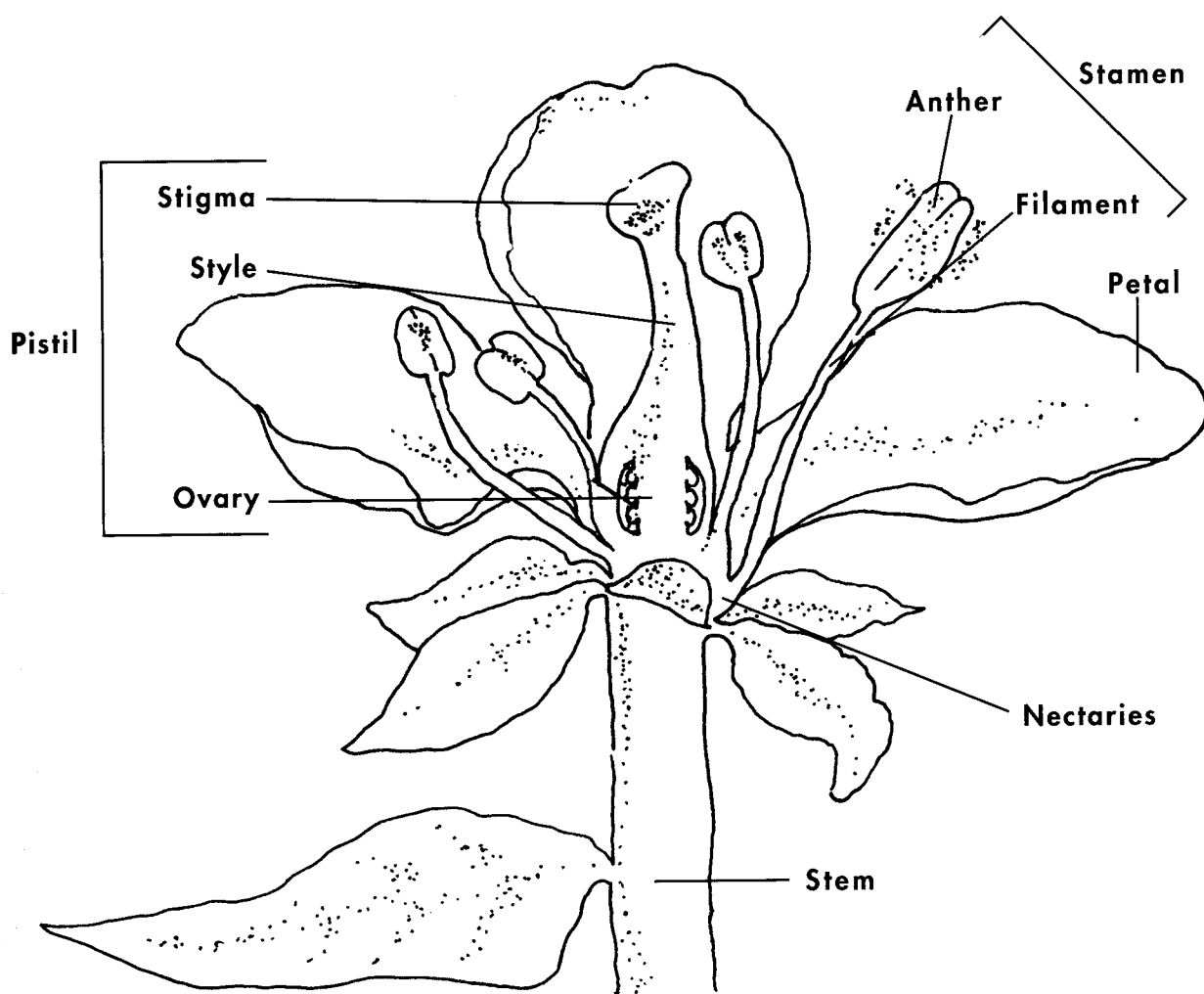
BEES ARE IMPORTANT POLLINATORS

The work of honeybees is an important part of two different food chains beneficial to people. One food chain includes the fruit resulting from the pollination of flowers. The other food chain involves honey. Both food chains start with the flowers of plants. In both cases, people and other animals consume the fruit and the honey.

Many plants need to be pollinated to produce seeds or fruits. Pollination is the transfer of pollen grains in flowers from the stamens (male part) to the pistil (female part). Without pollination, fertilization does not occur, and plants will not produce seeds or fruit. Some plants can pollinate their own flowers. This is called self-pollination. Pollen is transferred from the stamen of the flower to the pistil of the same flower or to a separate flower on the same plant. Examples of self-pollinators include tomatoes, cotton, and wheat.

Other plants need pollen from another plant or even another plant variety. This is called cross-pollination and pollen is transferred from the stamen of one flower to the pistil of the a flower on another plant. Plants that are cross-pollinated rely on external agents, such as insects, birds, wind, or water for pollen transport. Around 80% of plants are pollinated by bees. More than 100 agricultural crops in the United States are pollinated by bees. This means bees are important, if not essential, for the production of many crops that we enjoy everyday like apples, watermelons, cantaloupes, and strawberries. Pollination is also important to crops produced in Wyoming including barley, range grasses, and alfalfa.

As the worker honeybee moves from flower to flower collecting nectar, pollen, and water, a very important thing happens. The bee brushes against the pollen in the blossoms. Pollen, a tiny, grainy material, is made by the anther with is located at the tip of each stamen (male part of a flower). The stamen is usually located at the top or outside of the flower. Pollen is usually yellow but some flowers have white, red, blue, or black pollen. In order for seeds and fruit to form, pollen must reach the female part (pistil) of a blossom. The pistil is generally located in the lower or inner part of the flower. When the pollen meets the stigma on the pistil, pollination occurs. Pollen sticks to a bee's body and legs. Much of it is deposited in a hairy cavity on the legs called a pollen basket.



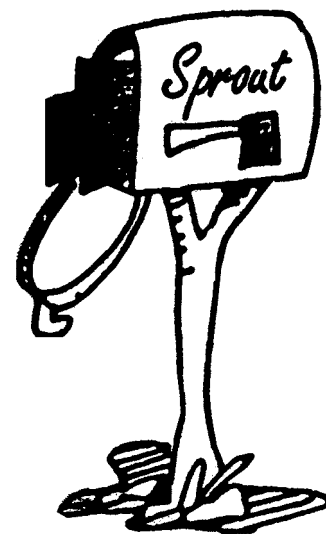
Dear Readers,

Hi all you busy bees. Ha! Ha! Did you learn something about how important bees are - why they are really important to our ranchers and farmers.? I hope so. I know I did!!

Be sure to enter our bookmark contest. All entries need to be entered by February 1st 2005. Good Luck!!!

See you next time.

Sprout



THE BEEKEEPER

The beekeeper, or bee farmer has the awesome task of managing the honeybees, maintaining bee equipment and marketing the honey. Managing these hairy pollinators is difficult to say the least.

The beekeeper are important as they must find fields for the bees to pollinate and put the correct number of bees in that area. Another important task of the beekeeper is to harvest the honey out of the bee box hive and market it. We sure do like the tasty honey from bees.

There are four apiary inspectors employed by Wyoming Department of Agriculture. These inspectors examine hives to assure diseases are detected and treated early before the diseases spreads to other colonies.



WHY DO BEES MAKE HONEY?

We know that bees have been producing honey for at least 150 million years. Bees produce honey as food that they store in the hive for the long months of winter. The honeybee produces such an abundance of honey, far more than the hive can eat, that humans can harvest the excess. For this reason, beekeepers can extract honey from the bee hives.

BEE MATH



1. To gather one pound of honey a bee must travel a distance equal to at least 3 times around the world. How many miles will it travel?

Equator = 24,900 miles
_____ Miles

2. It takes 160,000 bee-hours to produce one pound of pure ripened honey. How many hours would it take to make 1/2 pound of honey? Change the fraction to a percent and a decimal.

1/2 = _____ % • 1/2 = _____ • _____ hours = 200 %

3. Using the information from problem one, figure out how many miles a bee must travel to make five pounds of honey?
_____ Miles

4. Using the information in problem two, figure out how many bee-hours it would take to make 6 pounds of honey.
_____ Hours

5. A honey bee must make approximately 154 trips to and from the hive to produce a teaspoon of honey. How many trips would it take to make a tablespoon of honey?

3 teaspoons = 1 tablespoon
_____ Trips

6. Using the information given in problem five, figure out how many trips a honey bee would make to and from the hive to make 1 cup of honey?

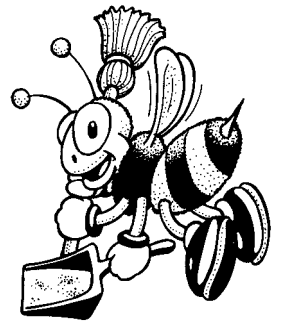
Answers: 1. = 74,700 miles 2. = 80,000 hours 3. = 373,500 miles 4. = 960,000 hours 5. = 462 trips 6. = 7,392 trips

HONEY AND OTHER PRODUCTS



Honey is a natural food produced by honey bees from plant nectar. The nectar is transported to the hive where the hive bees then fan the nectar in the cell and as the water is drawn out of the nectar the end product becomes honey. Honey is often used as a sweetener or as a sugar substitute. Some places you have seen honey is in breakfast cereals, salad dressings, and bread, just to name a few.

Other products from the hive consist of pollen which is used as a health food supplement because of the many vitamins and minerals it contains. Royal jelly is also used as a health food supplement. Bee venom is collected and used medically to help prevent serious allergic reactions to bee stings. Bees' wax is also used in cosmetics, creams, salves, inks, lubricants, paints, varnishes, polishes, and many other products.



TODAY...

List below the products made from bees that you have eaten or used today: (don't forget things like vegetables and fruits that bees help pollinate on your list)

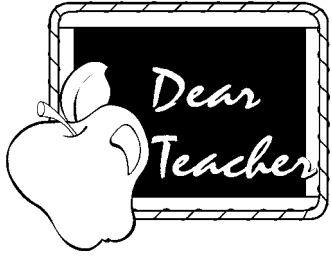
DID YOU KNOW...

Hey, that bee just stung me. What should I do now? The first thing to do after being stung by a bee is to remove the stinger. Once a honey bee stings, she pulls away from the sting site leaving a venom sack which continues to pump venom into the wound. To remove the stinger, do not pull it out as it will discharge more venom into the sting site. The best thing to do is to scrape underneath the stinger, by using a finger nail or something hard like a credit card. Then once the stinger is removed, put some ice on the spot.

Wyoming Agriculture In The Classroom

TEACHER GUIDE

Volume 5



Dear Teachers,

Wyoming Agriculture in the Classroom would like to thank Skip Bryant, an apiary inspector for the Wyoming Department of Agriculture, for his help in the creation of this issue. Wyoming Agriculture in the Classroom will be undergoing large changes in the next year and we need your input on how to make our offerings better. We are in need of professional educators to help us with this project. If you are interested, please contact our office.

As a way to celebrate agriculture, Wyoming Agriculture in the Classroom will again hold its Annual Bookmark Contest. A flyer will be sent to all teachers the first part of the school year. New changes are being made to the program to make it a more rewarding and educational experience for teachers and students. All entries are due to the WAIC office by February 1, 2006. WAIC's Annual Bookmark Contest is a great way to showcase student learning and a great assessment tool for teachers. The bookmark contest is also a way to introduce students to professional publication and good work practices. If you are interested in more information about our bookmark contest or how to serve on our selection committee, please contact our office.

*Sincerely, Sarka J. White, M.Ed.
Education Coordinator WDA/WAIC*

If you want to continue your study on agriculture and need more information to enhance your classroom studies, please contact Sarka J. White with Wyoming Agriculture in the Classroom, 2219 Carey Ave., Cheyenne, Wyoming 82002, and (307) 777-6618. Wyoming Agriculture in the Classroom has an extensive resource library and training that is free to all Wyoming teachers. Visit our website at www.wyomingagclassroom.org for information and links to other agriculture literacy sites for educators and families.

Potpourri...Discussion Prompters and Projects

Some additional projects and ideas to extend the use of the "Country to Classroom" magazine.

★ Discuss what the bee does with the nectar that is collected from each flower. Where does honey come from and how do animals and people use honey? Bring samples of honeycomb and honey for the students to observe and taste.

★ Ask local grocery stores or florists to save discarded flowers of various varieties. Have the students use hand lenses to study the parts of the flower. Ask them to look for pollen and then take apart the flowers. Have them draw and label the different parts of the flowers.

★ Have youth do research where the first bee colonies started in the New World. Make a bulletin board of the history of bees and include when they were introduced in to the New World and Pin Point the first bee colonies in the New World.

★ Investigate what agriculture producers do to bring bees into their fields in your local area. Take a field trip to a local farm or ranch in your area and have the youth look for bees pollinating crops (this is best in the spring time in Wyoming).

★ Contact the County Extension Agent for a list of beekeeper in your area. Invite a local beekeeper to class to learn more about beekeeping. Have the students research more about careers in beekeeping and other related careers.

★ Research other methods of plant propagation besides the formation of seeds (e.g., grafting, cutting, or breaking plant apart). Have students give examples of plants that are propagated in different ways. Have them create charts that illustrate the various methods of propagation.

★ Look at these websites for more information on honey bees and pollination in the U.S.: www.honey.com & pollinator.com.

Wyoming Content and Performance Standards 4th and 8th grades

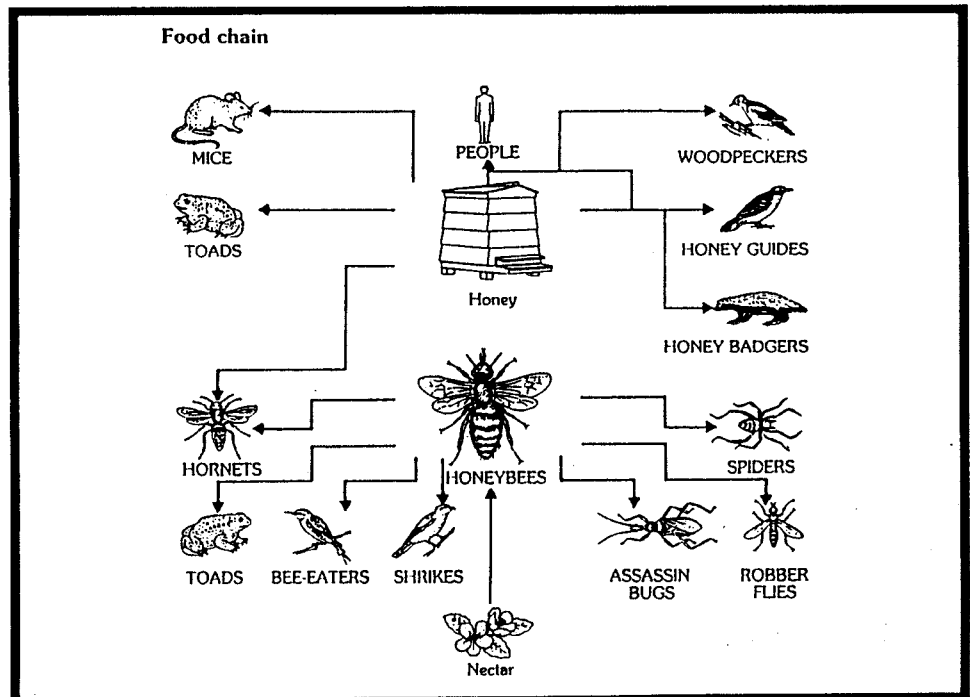
Language Arts: 1. Reading; 2. Writing; 3. Speaking and Listening.
Science: 1. Concepts and Knowledge; 2. Science as Inquiry; 3. History and Nature of Science in Personal and Social Decisions.
Social Studies: 3. Production, Distribution and Consumption; 4. Time, Continuity and Change; 5. People, Places and Environment.
Mathematics: 1. Number and Operation; 2. Geometry; 3. Measurement.

The Food Chain

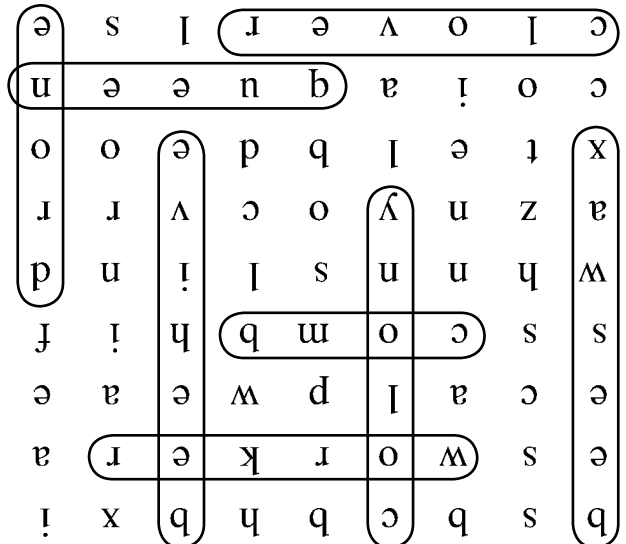
We know that plants, animals, and humans depend on each other for survival. If we look at a common meadow, we see that flowers provide food for the honeybee. Other animals in turn, feed upon the honey bee and its products. As bees pollinate flowers, they ensure the production of seeds. Seeds become future generation of plants. And the food chain continues.

As humans impact the environment through urban development, increased cultivation, and increased chemical use, the honeybee's food chain is disrupted. This in turn affects the food web which is heavily dependent on the honeybee. It is essential for us to understand our role in maintaining a healthy, natural balance in an increasingly fragile world.

Talk to your students about the food chain and how we all depend on other species for survival. Share the following form to discuss the Food Chain and how important bees are to that food chain. After the discussion, have the students write a paragraph describing why bees are important in the food chain process.



OF HEXAGONS ON COVER: 127



"COUNTRY TO CLASSROOM" is a publication of WYOMING AGRICULTURE IN THE CLASSROOM.

Wyoming Agriculture in the Classroom is a cooperative effort of many Agriculture organizations and individuals around the state. Materials are compiled from the following sources: Wyoming Department of Agriculture, United States Department of Agriculture, Wyoming Beef Council, Wyoming Ag in the Classroom, Montana Ag in the Classroom, Minnesota Ag in the Classroom, National FFA, Oklahoma Ag in the Classroom, National Honey Bee Association, Nebraska Ag In The Classroom.

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