

Those Busy, Buzz'n Worker Bees



LEVEL: K-3

SUBJECTS: math, (sequencing),
geometry, art, language arts, science

AZ ACADEMIC STANDARDS: R-FS4, LS-FS5,
4MR1, 4MR2, 4MF1, 4MF2, SC01-S4C1, SC01-S4C2,
SC01-S4C3, SC02-S4C1, SC02-S4C2, SC03-S4C1, SC03-
S4C2, SC03-S4C3

MATERIALS

Session 1:

flower pattern, 2 sheets construction paper in colors flowers would be, scent or flavorings, cotton balls, eyepiece that has facets on it resembling compound eyes, flashlight that has a strong beam and exudes some heat, light scarf to cover eyes.

Session 2 (and 3 or 4):

Books about bees.

Session 3:

make a transparency and copies for each student of vocabulary words (vocabulary sheet), small envelopes for students to keep word strips

Session 4:

Crayons, ½ sheet honeycomb design for each student, transparency of Honeycomb Design 1 and overhead markers, transparency and copies for each student of Honeycomb categories, vocabulary word strips

Session 5:

copies of 4 booklet pages, enough for each student, construction paper for booklet covers (folded in half, hamburger style) glue or tape

Session 6+:

Depends on activities chosen for honey-making products.

VOCABULARY

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body parts: head, thorax, abdomen, proboscis, antennae, compound eyes, simple eyes, large wings (fore wings), small wings (hind wings), mandible, stinger

life cycle: egg, larva, cocoon, pupa, metamorphosis, adult, worker bee (house bee, nurse bee, wax-making bee, guard bee, forager bee), drone, queen, worker bee

beehive: colony(ies), honeycomb, cells, wax, brood cells, hexagon, beekeeper

flowers: stamen, pistil, nectar, pollen

scientific processes: metamorphosis, pollination, evaporation, extraction, regurgitation

RELATED LESSONS

To Bee or Not to Bee
Buzzing Bee's Wardrobe
How Busy are Bees?
Do The Honeybee Dance?

SUPPORTING INFORMATION

Bees are fascinating! They have a short but unique life. Each bee throughout its short life, has many different tasks. There is only one queen, a hundred drones, and lots and lots of worker bees, in fact, there may be 50,000 bees in a colony. These busy workers make honey, produce wax, and pollinate plants. While a queen and the drones are very important in the study of bees, the focus for this series of activities will be on the worker bees.

A prerequisite for starting this unit is for the students to already know

BRIEF DESCRIPTION

Students pretend to be bees smelling flowers and sensing the sun while learning how bees work hard to produce honey and wax.

OBJECTIVES

The student will:

Review the body parts of insects.

Become aware of how bees detect flowers.

Become aware of how compound eyes and simple eyes work for bees.

Distinguish related words.

Alphabetize some of the vocabulary.

Reconstruct the life cycle of a worker bee.

ESTIMATED

TEACHING TIME

Session 1 takes about one hour. Session 2 is looking at books and discussing them. Time could vary. Session 3 could be 20-30 minutes. Session 4 takes 30-40 minutes. Session 5 needs 45 minutes to an hour.

SUPPORTING INFORMATION (cont'd)

the body parts of insects so additional feats of bees can be added.

Bees detect smells or fragrances with their antennae which are also used for touch. The two compound eyes are readily seen. Each eye is made up of many eye lenses joined together. Bees also have three simple eyes on the top of their heads that are sensitive to light to help register where the sun is in the sky. They have four wings; two larger ones (fore wings) and two smaller ones (hind wings). They suck nectar with their hollow tongues, called the proboscis. Nectar collected from the flowers is stored in a honey sac inside the bee near its stomach. The back legs have pockets or a basket for pollen to collect as they visit the flowers. The other legs have combs that are used to pack the pollen grains onto the hind legs. The stinger at the base of the abdomen is used for protection. Once a worker bee stings something, the stinger comes out of her body and she dies.

Liquid wax oozes out of small holes on the underside of the abdomen. This wax dries into little flakes. The flakes are pulled off with the legs and taken to the mandibles to chew. The softened and chewed wax is used to build and repair the honeycombs. It is also used to seal brood cells and honey storage cells. Bees are social insects and are very structured living in a colony. There are many special jobs that need to be done for them to survive. The queen is the largest and lives the longest – from three to five years. She is responsible for keeping enough bees in the hive. She can lay up to 2,000 eggs

each and every day. She doesn't even take time to eat. Nurse bees have to feed her. Drones are the only males in the hive. Their only job is to mate with the queen and then they die. Worker bees are the smallest and all are females. They live for about six weeks to two months in the summertime. Some will live a few months longer over the winter. In the short time worker bees are alive, they have lots to do.

It takes about 21 days for a bee to develop or go through its metamorphosis. Most of the cells in a beehive are for storing honey and pollen. Brood cells are needed for the queen to lay eggs and for the bees to grow and develop. The eggs the queen lays are about the size of a sentence or the dot of the letter "i". After three days, a larva hatches. The larva is fed bee milk for three days. Bee milk, or royal jelly, is a yellow, milky syrup that the young worker bees secrete to feed the larva. For another three days, the larva of the worker bee is fed beebread which is a combination of pollen and honey. (The queen is always fed royal jelly). The larva grows quickly and then spins a cocoon around itself. A house/nurse bee seals the cell with wax. In the cocoon the bee is called a pupa. This is when it changes the most and begins to look more like an adult insect. At about twenty-one days the adult bee chews its way out of the brood cell.

As an adult the worker bee will be very busy because there are so many jobs for her to do. Here again the society has structure so all the work gets done. At first the bee works inside the hive and is called a house bee. She cleans and polishes the cells. In about three days she

becomes a nurse bee. At this time she can produce the bee milk to give to the larva. After about ten days as a nurse bee, she becomes a wax-making bee. Flakes of wax ooze out of her abdomen. The wax quickly dries and she uses her legs to get the flakes up to her mandibles so she can soften it and mold it to make new cells or repair old ones. At this time she also helps store the nectar and pollen that is brought back to the hive.

After about three weeks as a house bee, she is ready to go outside the hive. At first she guards the hive. Her antennae stay alert for any scent that will warn her of danger. If she smells danger, she will spread a special scent to warn the others. If she stings something, she will die. If it is hot she will also help fan the hive to keep it cool.

Her last job is as a forager bee. This is when we see the bees zipping from flower to flower. As she visits each flower, she sucks nectar and stores it in her honey sac, a separate stomach just for that purpose. Pollen sticks to the "baskets" which are special hairs on her hind legs. She visits between fifty and a hundred flowers on one trip. This helps pollinate the plants so fruit and seeds will develop. When her sac and baskets are full, she makes a beeline back to the hive. Back in the hive the forager bee regurgitates the nectar. The nectar is transferred by tongue to a house bee (wax-making bee). She swallows it and enzymes from her stomach are added to the nectar. When she regurgitates the nectar, it is passed by tongue from bee to bee until the moisture is gone. When it is ready, the wax-making bee places the nectar in a honey cell where it

continues to dry. Bees continue to add more processed nectar to the honey cell. The wax-making bees might cluster over the cell and fan with their wings to evaporate more moisture from the cell. Finally, when the cell is full, a wax-making bee caps or seals the cell with wax. The nectar inside the cell will become thicker and thicker until it becomes honey.

The honey stays in the cells until it is needed to make bread or until the beekeeper harvests it. The pollen from the baskets on her legs is stored in separate cells. As a forager bee she may visit up to 10,000 flowers a day. She tells the other bees where she finds flowers full of nectar by dancing. A circle dance tells the other forager bees that the flowers are within about 300 feet of the hive. To make the dance, she circles one way, turns around, and circles back the other way. If the flowers are more than 300 feet from the hive, she needs to tell them which direction to go. She does this with a wagtail dance which looks like a figure eight. The line she makes between the circles is the direction to the flowers in relation to the sun. The number of times she wags her tail in fifteen seconds tells the other bees how far away it is to the flowers.

Beekeepers set up boxes for the bees to use as hives. This makes it easier to transport the bees when they are "hired out" to help pollinate crops. In Arizona, bees are used to pollinate citrus, cantaloupe, honeydew, watermelon and seed crops of vegetables like broccoli and onions. When they take out the honeycomb, they only scrape off the top layer of wax. After the honey is extracted and the leftover honeycomb replaced, the

bees don't have to work as hard making new cells. They just repair the cells and start collecting nectar sooner. Different kinds of honey come from different kinds of flowers and of course the taste will vary. Clover honey is the most common. Honey is added to food and drinks to make them sweet (and is better for our bodies than sugar). Some examples would be candies, breads, cookies, jams, salads and salad dressings, and granola. Beeswax is used for candles, waterproofing, floor wax, lipsticks, lotions, and crayons. Waxing tools will stop rust from forming and will make the tools easier to use.

GETTING STARTED

Gather pictures and books about bees, honey, crayons, and wax. Collect crayons, lipstick, paraffin (sold in boxes at most grocery stores), and candles (especially birthday candles!) for a display. Have a scent or two available for smelling. (Essential oils or candle scents are expensive but strong; flavorings like strawberry, mint, and lemon from grocery stores are cheaper and effective.) Purchase a compound eyepiece for students to look through. Jars of different flavors of honey, honey in a honeycomb, and other bee products can be added throughout the unit. Cut out flower pattern and several flowers of different colored construction paper. Make transparencies and student copies of worksheets and life cycle pages. Choose honey and wax activities and arrange for volunteers or write them up in the classroom newsletter.

PROCEDURES:

Session 1: A Flower Garden

1. Tell students they are going to be bees and detect flowers to make honey. Encourage children to put their antennas up and wave them (both arms in the air waving). Humans don't have antennas so we have to smell the "flowers" with our noses using our hands and arms as antennas to bring the fragrance to our noses.
2. Take one cotton ball for the first scent and place a drop or two on the cotton ball and place the ball in the center of a paper flower. Take the flower around so each child can get a whiff. Waving a hand over the cotton ball toward the nose is usually sufficient. Students should not put their noses into scent as some smells can be strong and irritating. Students can pretend the hand is an antenna bringing the fragrance to them without touching the cotton ball. Or wave the flower in front of each child's face and ask: Can you tell what that smell is? Usually someone can recognize the scent. If not give the class some hints with one being the correct answer. Continue with other scents if desired.
3. Tell the students that they are now going to use their bee eyes. Ask if they remember seeing the BIG eyes on a bee. They are called compound eyes. Let students look individually through the compound eyepiece. As they look, let students know that bees cannot see red or white. Encourage students to ignore the red and white colors and see if the other colors become more evident.
4. Bees have three other eyes that are called simple eyes. Ask: When do you see bees? That's right, in the daytime. Bees need the sun to help them. When they fly

out and find nectar in flowers, they come back to tell the other bees where to find the same flowers. They create a dance based on where the sun is. We don't have these simple eyes but maybe we can tell where the sun is. It helps if the room is somewhat darkened for this activity. Have a student sit in a chair. Gently snug the scarf over his eyes. Have four to six more students gather in a circle facing the one in the chair. Quietly walk around the outside of the circle and hand the lighted flashlight to one of the students in the circle. Take her hand to show her how to shine the light on the person's head (NOT face). Continue walking further around the circle. Ask the student in the chair: Can you tell where the sun is coming from? Can you show us with your hand? After the student shows where he thinks the sun is, loosen the scarf so he can see how accurate he was. Let other students sit in the chair to see how well they can sense the sun. Some students will be close and others won't. It may depend on how close the flashlight is. Just be sure no one touches the student's head who is sitting in the chair. Others can try this on their own in a small group activity center. Our sun obviously isn't as close as our flashlight. Aren't we glad bees have simple eyes so they can tell accurately where the sun is. Ask – If a bee goes to the same flower bed later in the day, will her dance be the same as the one she dances right now? Why not? That's right! The sun will be in a different position.

Session 2: (and 3 or 4)
Students need time to assimilate information. Read

books about bees to the students. Let them look at the books and displays. Have vocabulary on the bulletin board or around the classroom. Discuss what they are learning. Bring up vocabulary words and discuss what they mean. Let students ask questions and find out (or review) what the books say. Use the vocabulary every chance possible. Review basic life cycle of bees:
Queen lays eggs
Drones mate with queen and die.
Workers are females and go through many stages in their lives: egg, larva, cocoon, and pupa are typical stages of insects. House bee (house, nurse, and wax-making bees)
Outdoor bee (guard and forager bees)

Session 3:

Continue session 2. Then show the transparency of vocabulary words. Point to words and have students say them. Review meanings. Distribute vocabulary sheets to students. Let students cut out their own words strips and put in an envelope for later.

Session 4:

1. Introduction Activity:
Grandmother's Flower Garden
Bees put eggs, pollen, and nectar into different cells of the honeycomb. Have children pick 3 colors of crayons. One color will represent brood cells where eggs are placed. Another color will represent the cells where pollen is stored. And the third color will represent where nectar is stored for creating honey. Since crayons are made with wax and dye, it is appropriate to use crayons for this activity. Distribute honeycomb design sheets.

Instruct students to find the middle hexagon and color it with one color.
The six hexagons around that should be colored with the next crayon.
Color the next surrounding cells (12) the third color.
Have students estimate how many cells will be in the next round. (18)
Honeycomb Designs 2 is available to let students create other designs, if desired, in a center or at their desks.
2. Honeycomb Categories
Today we are going to put our vocabulary in special cells by dividing the words into categories.
Show Honeycomb categories on overhead. Discuss the categories and have students give examples of words that could go in each.
Place a word outside the hexagons. Have a student say the word and state which category it belongs in. If wrong, have class members help determine what the word is and where it belongs. Continue with the rest of the vocabulary. Feel free to adjust words as some could be in two categories. For example: metamorphosis could belong in life cycle as well as scientific processes. Distribute honeycomb pages to students. Have them pull out their word strips and categorize them. Give them some time to do this.
Let students pick three to five words from one category. Have them put the rest of the words in the envelope. Let students put 3 to 5 words left out in alphabetical order and glue to the correct hexagon.
Session 5: Life Cycle of a Worker
Have a sample booklet cut out and show the process (not the finished project) to the students. Have students decide which pictures go with

which page. Tape pictures on. Have students help you put your copy together in the right order. Then let students make their own booklets. Distribute booklet pages and bee pictures. Have students cut pages out on the solid lines and fold pages on the dotted lines. Have students cut bee pictures out. Let them match the bee pictures to the sentence strips on pages and glue. Then students lay pages out in the proper order and glue pages together with the tabs underneath the printed pages. Have students glue the first page of life cycle inside of the cover on the bottom half. When glue has dried, let students fold the pages into the book. The cover could be decorated with title "Life Cycle of the Worker Bee" and picture before or after gluing pages in. Call attention to the fact that the pages don't close to make a circle. Students need to be aware that the female bees do not lay eggs as part of their cycle. That is only the job of the queen. What happens to a bee as it forages for nectar and pollen? Some day it dies. Most bees die outside the hive. Dead bees found inside the hive are pushed out by house bees.

Session 6+:

Pick activities for honey and for wax. Have parents or volunteers help with activities in the classroom or send recipes home in a classroom newsletter for families to try at home. Encourage students to share their family's reaction with their classmates.

EVALUATION OPTIONS

Following directions
Reading vocabulary and using it correctly
Categorizing vocabulary

Correctly matching pictures to each segment
Putting pages of life cycle in order

EXTENSIONS AND VARIATIONS

Science

Compare and contrast bees with other insects studied. Pollination Product Party - Have students bring in fruit and vegetables that bees help pollinate. These are products the bees help to produce for us to eat.

Bee Predators:

Unscramble this list to find out what enemies bees have:
dbri tsan cemi adot
rspdie imskk erab
fnordgaly

Communication:

Bees communicate to each other by dancing. Have students make a list of ways we "talk" to each other with our bodies.

Math/Shapes

Look at Color Farm and Color Zoo by Lois Ehlert. Share Tana Hoban's books on shapes. Encourage students to find shapes around them, especially hexagons. Use shapes to draw a bee. First draw an oval for the abdomen. Add a circle for the thorax. Add another smaller circle for the head. Add heart-shaped wings. Add wavy lines for legs. Add dot for eye. Erase lines where shapes overlap. Add stinger to back of oval. Add some stripes on the abdomen. Tangrams – see attached page of bee and flower

Social skills - Use bees for a "Bee Kind" unit. "Ima Honey Bee" could also share with other students.

Language Arts:

Make a word search using the vocabulary words. Create a crossword puzzle for the vocabulary and the meanings. Discuss sayings: "Busy as a bee" "A beehive of activity" "Making a beeline home"

Music: Play Berlioz' "Flight of the Bumblebee" and read Berlioz the Bear by Jan Brett.

RESOURCES

Cole, Joanne. The Magic School Bus: Inside a Beehive.
Fowler, Allan. Busy, Buzzy Bees. Chicago: Children's Press, 1995. (from Rookie Read-About Science series)
Furgang, Kathy. Let's Take a Field Trip to a Beehive. New York: PowerKids Press, 2000. (from Neighborhoods in Nature series)
Gibbons, Gail. The Honey Makers. New York: Morrow, 1997. The Honey Files: A Bee's Life. National Honey Board, 2001 video and teacher's guide at www.nhb.org
Honey Bees: Tales from the Hive. Nova video and website.
Hyder, Stewart D'Arcy. Great Candles. New York: Sterling, 2000.
Kalman, Bobbie. Hooray for Beekeeping! New York: Crabtree, 1998.
Keller, Casey. The Good Earth Bath, Beauty & Health Book. Iola, WI: Krause, 2001
McNeill, Suzanne. Beeswax Candles. Design Originals: Fort Worth, TX, 1995
The New Starting Right with Bees. Medina, Ohio: Root, 1997.
Neye, Emily. Honeybees. New York: Golden Book, 2002.
Polacco, Patricia. The Bee Tree. New York: Philomel Books, 1993.

Sanchez, Isidro. Wax Crayons: The Materials, Techniques, and Exercises to Teach Yourself to Draw with Wax Crayons. Hauppauge, NY: Barron's 1991.

Woods, Samuel G. Crayons From Start to Finish.

Woodbridge, Connecticut: Blackbirch Press, 1999.

www.honey.com

www.pbs.org/wgbh/nova/bee/s/

<http://tcrconnections.net>

(Username: ra-17827; Password: ra-17827: go to Connections for kids)

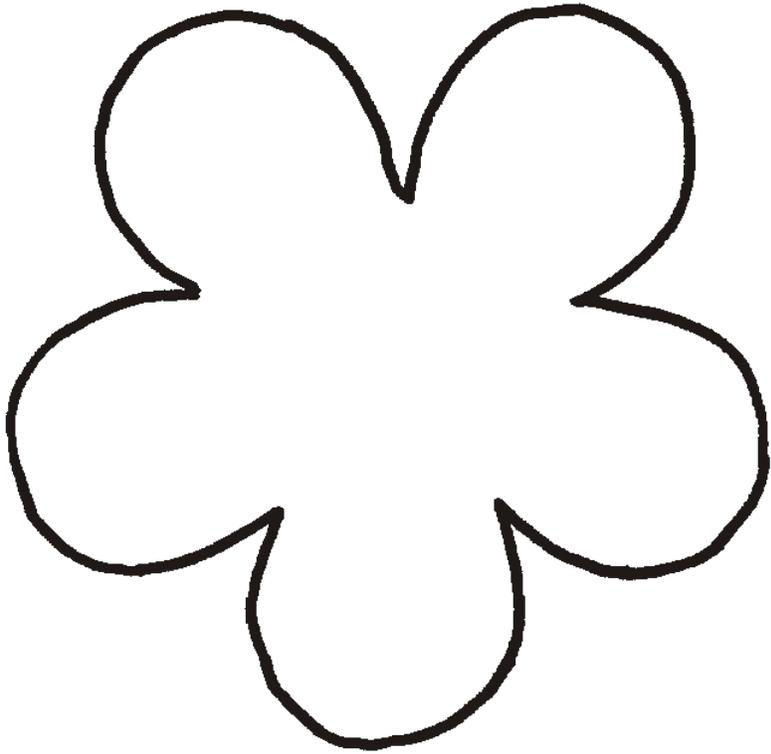
CREDITS

Bland, Julia E. The Honey Bee Dance. Lima Ohio: CSS Publishing, 2000. Books and web sites listed above.

EDUCATORS' NOTES



Flower pattern



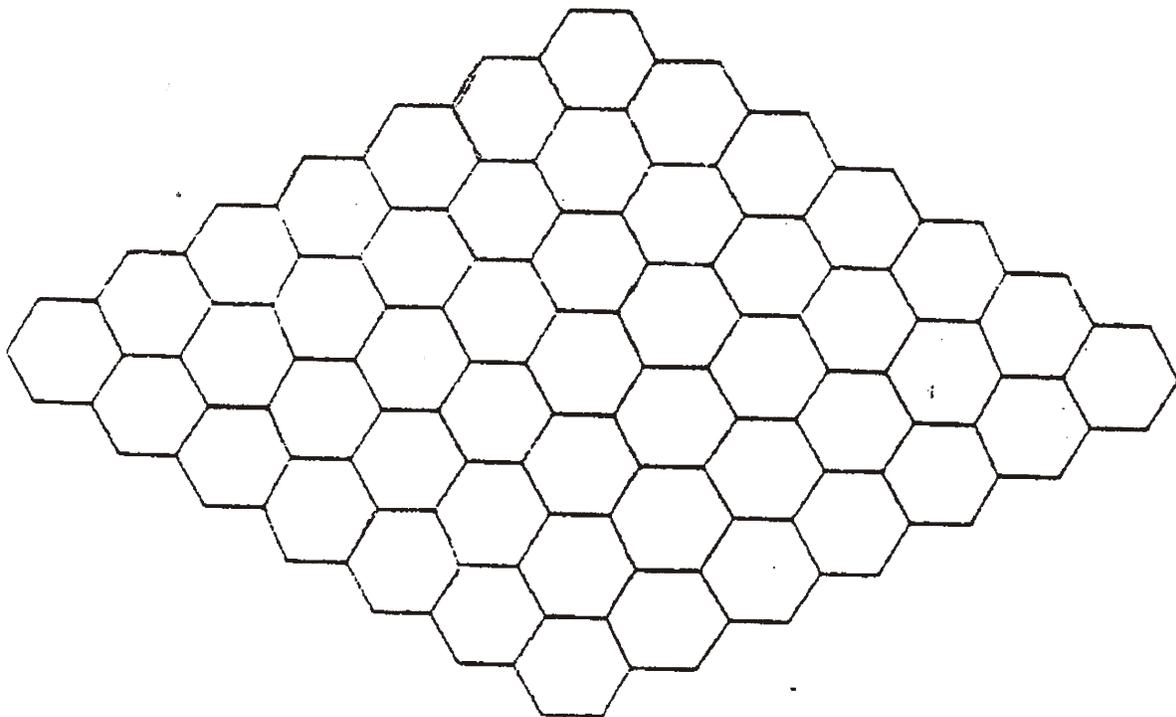
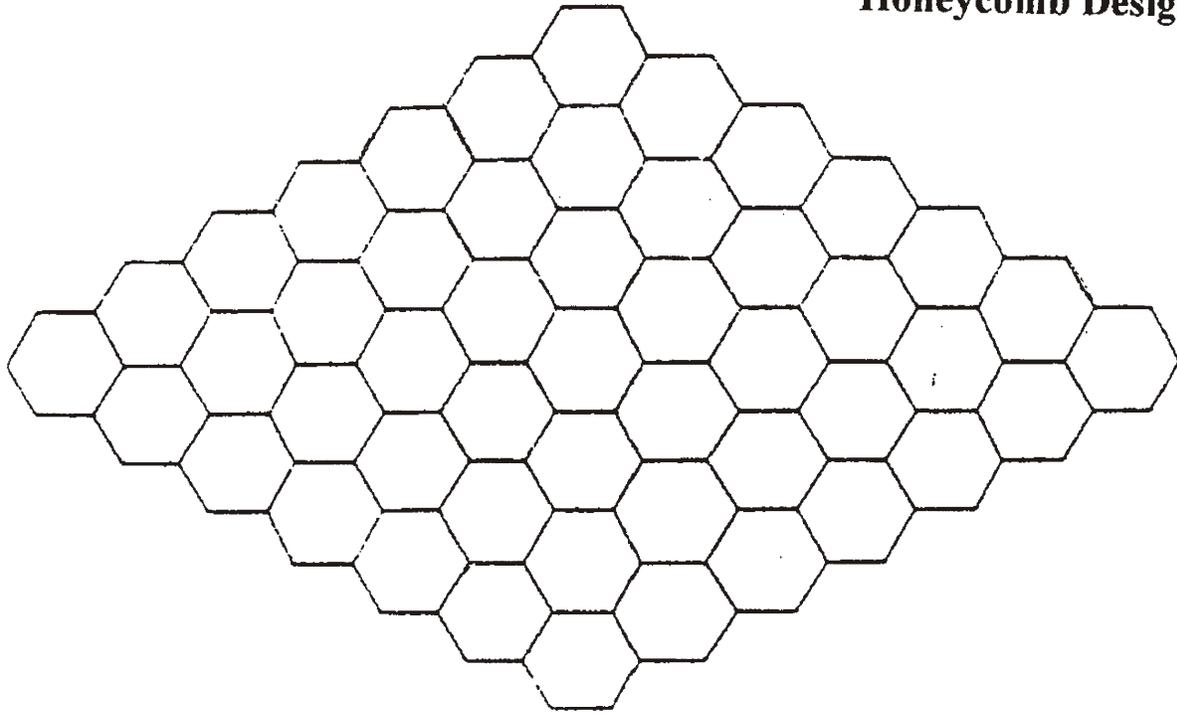
CURRICULUM DESIGN

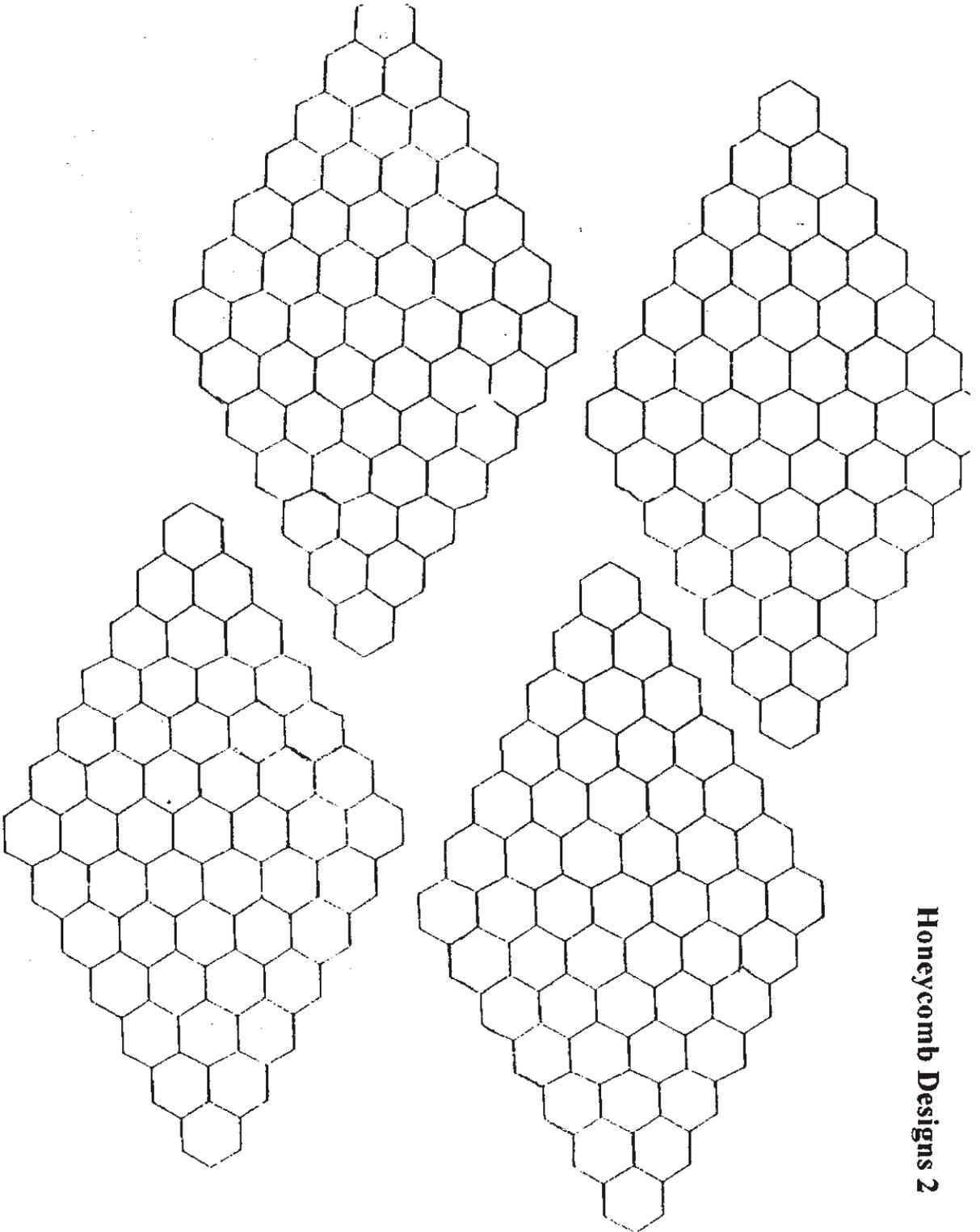
Patti Hulet, Librarian
Playa del Rey
Elementary
Gilbert, Arizona

*This Arizona Grown Specialty Crop
Lesson Plan was paid for by a
grant from the Arizona Department
of Agriculture's Office of
Marketing and Outreach.*

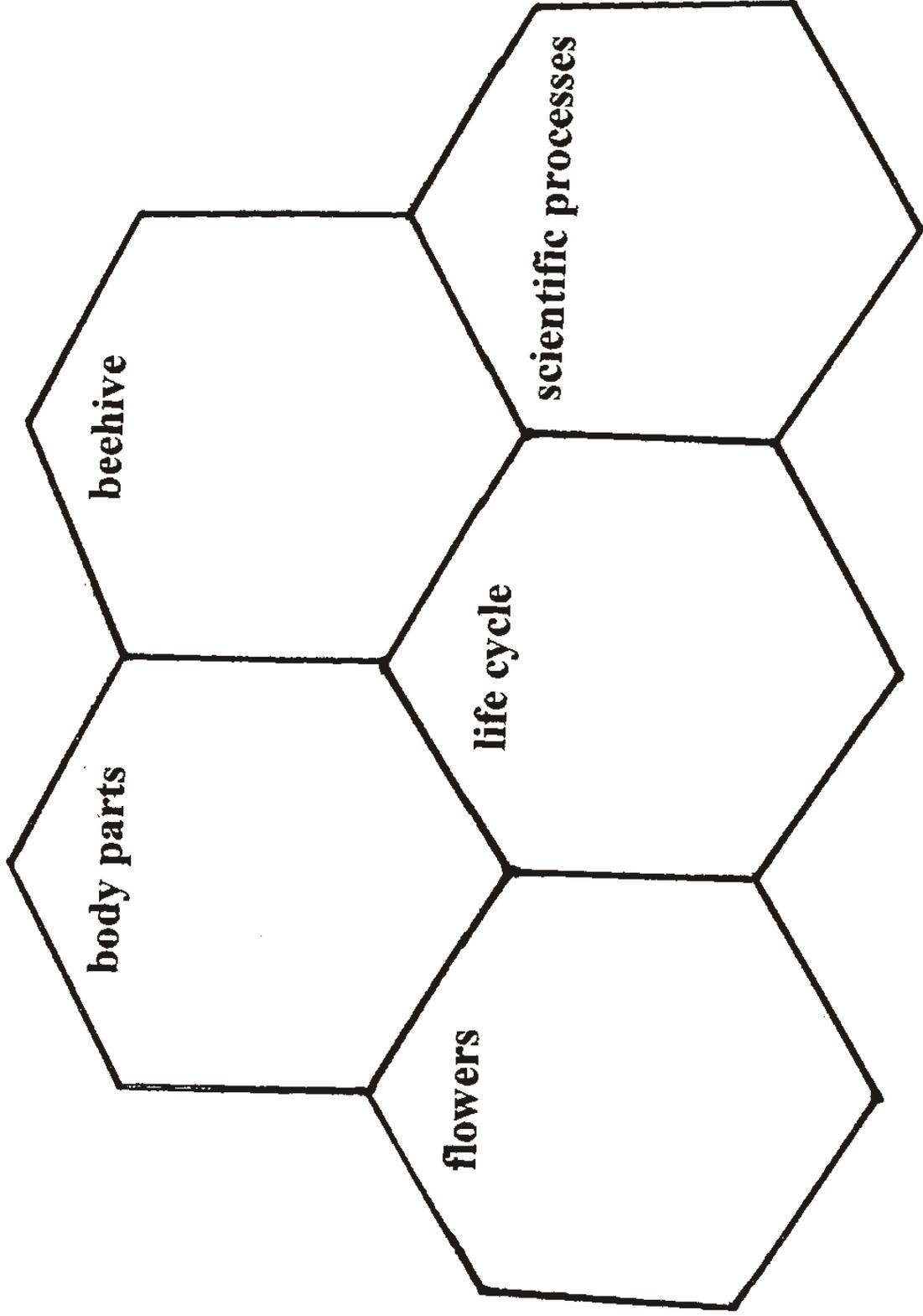
| | | |
|------------------------------------|----------------|---------------|
| queen | egg | cells |
| drones | larva | wax |
| head | cocoon | brood cells |
| thorax | pupa | stamen |
| abdomen | adult | pistil |
| proboscis | worker bee | nectar |
| antennae | house bee | pollen |
| compound eyes | nurse bee | metamorphosis |
| simple eyes | wax-making bee | pollination |
| large wings <i>(fore wings)</i> | guard bee | evaporation |
| small wings <i>(hind wings)</i> | forager bee | extraction |
| stinger | colony(ies) | regurgitation |
| mandible | honeycomb | beekeeper |
| | hexagon | |

Honeycomb Designs 1



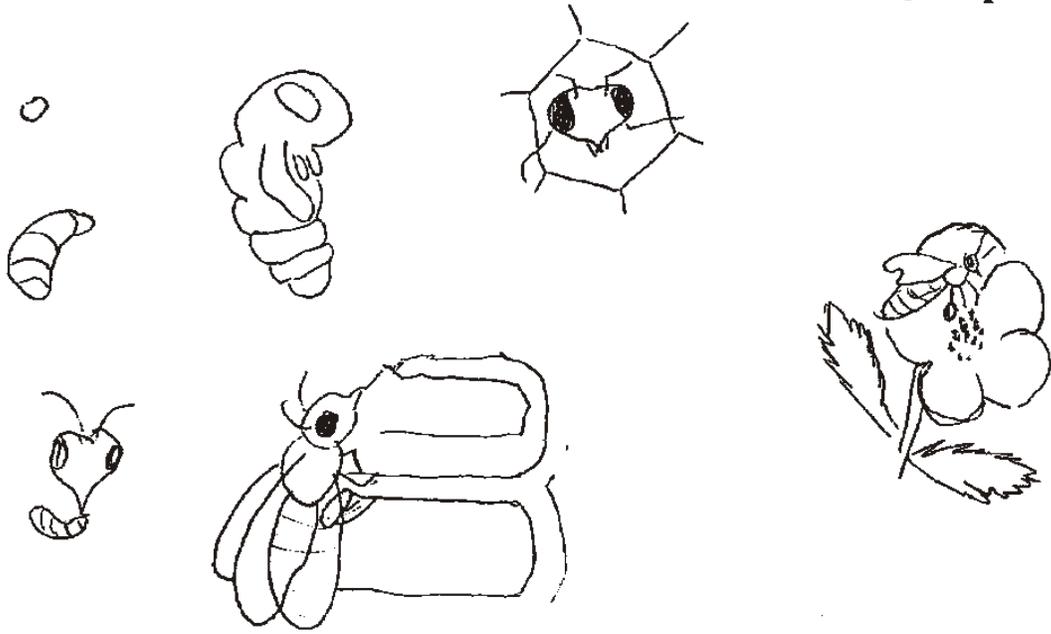


Honeycomb Designs 2

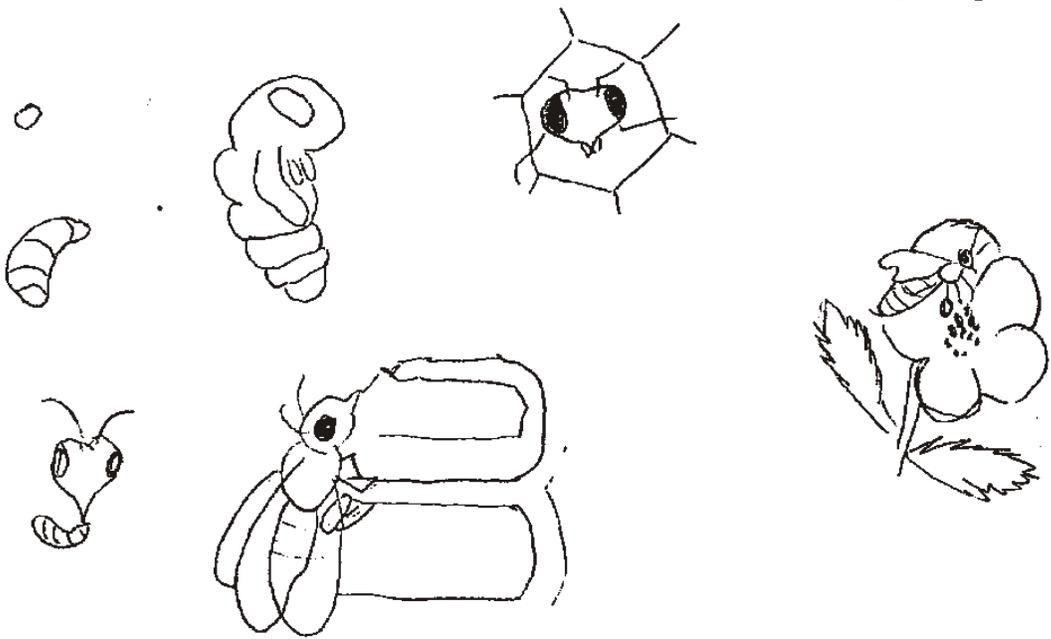


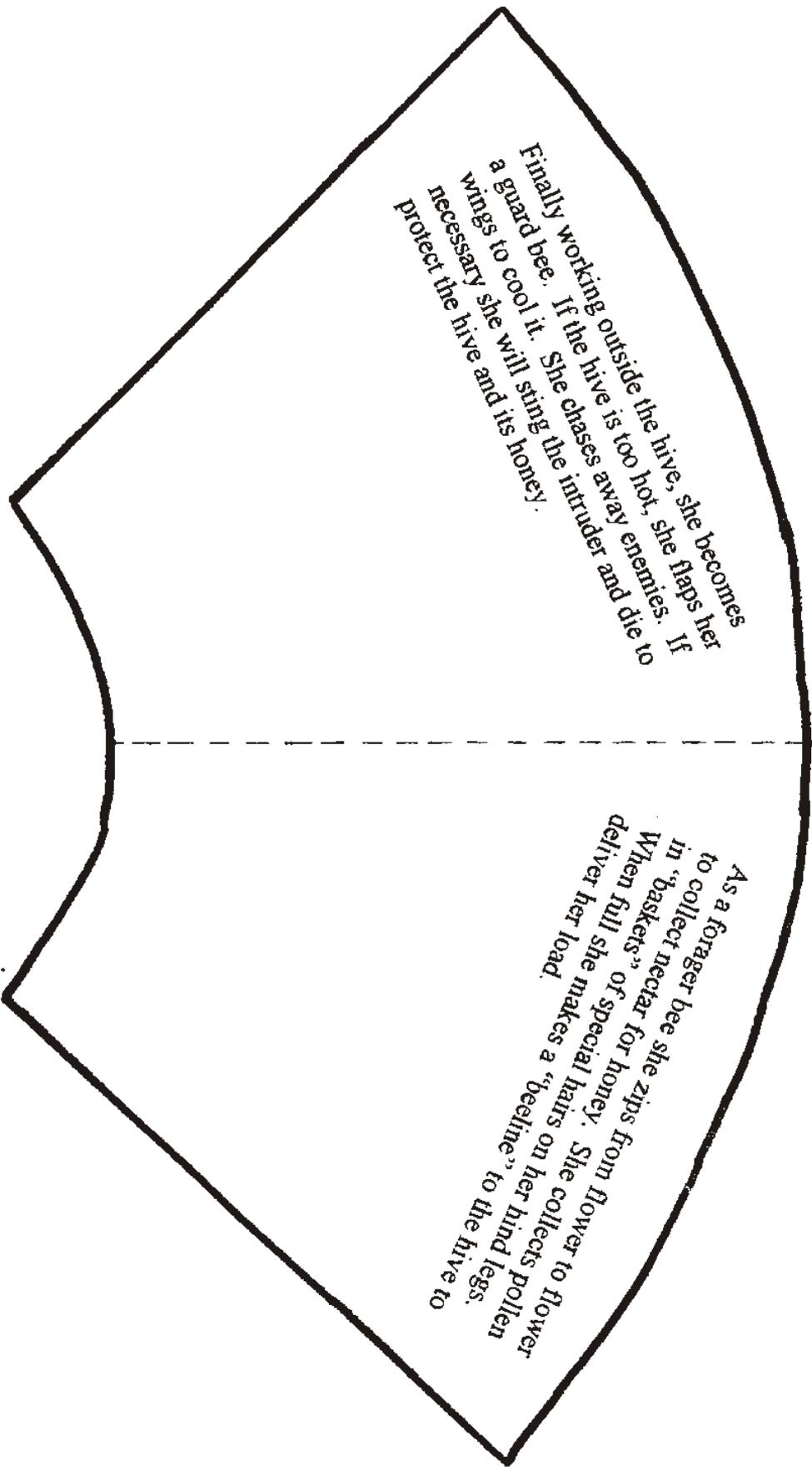
Honeycomb Categories

Life Cycle pictures



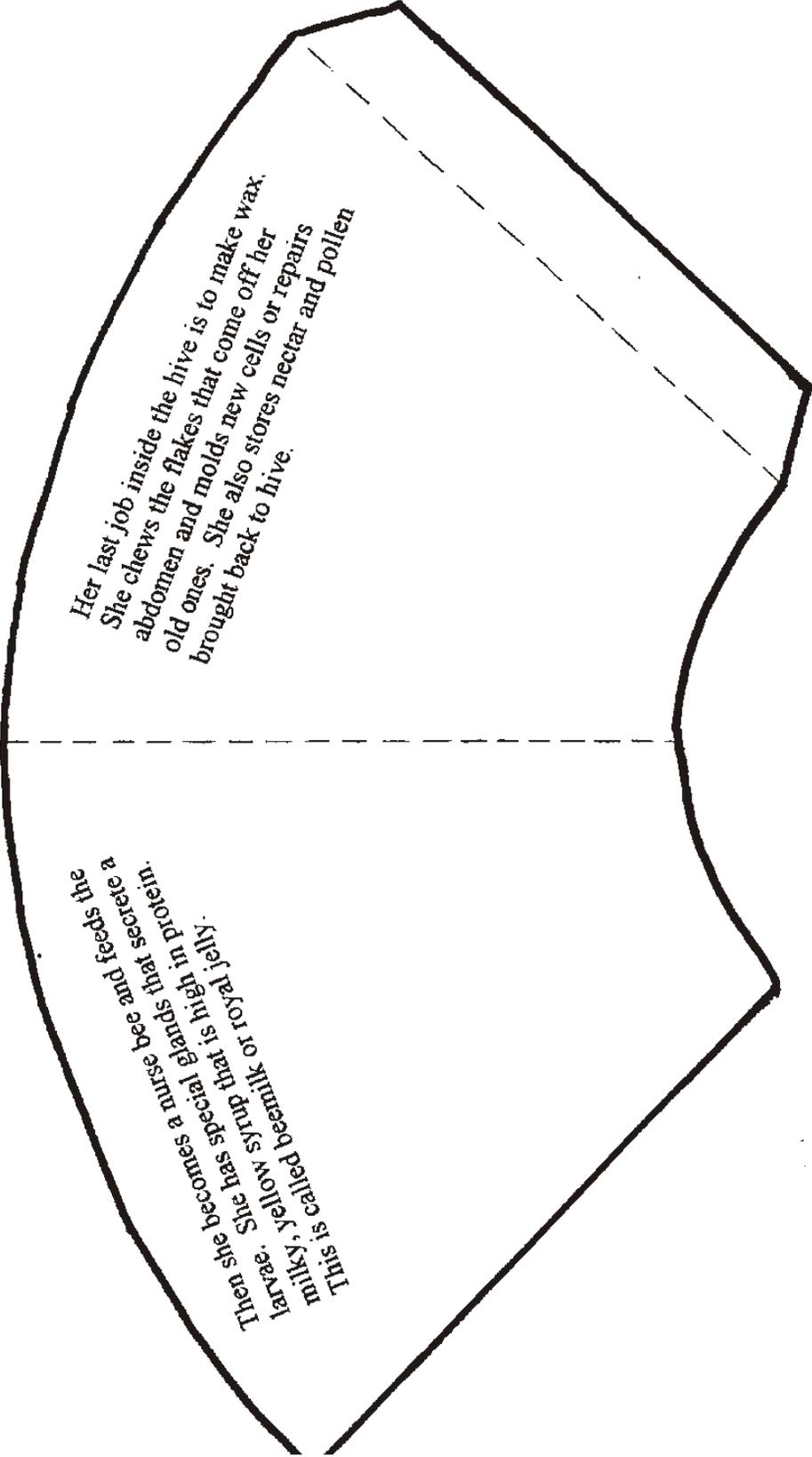
Life Cycle pictures





Finally working outside the hive, she becomes a guard bee. If the hive is too hot, she flaps her wings to cool it. She chases away enemies. If necessary she will sting the intruder and die to protect the hive and its honey.

As a forager bee she zips from flower to flower to collect nectar for honey. She collects pollen in "baskets" of special hairs on her hind legs. When full she makes a "beeline" to the hive to deliver her load.



Her last job inside the hive is to make wax. She chews the flakes that come off her abdomen and molds new cells or repairs old ones. She also stores nectar and pollen brought back to hive.

Then she becomes a nurse bee and feeds the larvae. She has special glands that secrete a milky, yellow syrup that is high in protein. This is called bee milk or royal jelly.

The larva stops eating and spins a silky cocoon around itself. A nurse bee seals the cell with wax to protect the pupa while it grows larger and develops eyes, legs and wings.

The adult worker bee chews her way out of the cell. She will live for about 45 days. The first three weeks she does chores inside the hive and is called a house bee. At first she cleans and polishes cells.

A soft, white egg is laid in a brood cell by the queen. It is the size of a period at the end of a sentence or the dot of the letter i.

Three days later the egg hatches into a larva. Nurse bees feed the larva beemilk and then beebread which is honey and pollen mixed together.

Honey .Products

Honey Butter

Beat $\frac{1}{2}$ **cup butter** with electric mixer till fluffy. Gradually add $\frac{1}{4}$ cup honey.
Beat until smooth.
If desired, add 2 teaspoons grated orange peel.
Delicious on waffles, pancakes, or toast.

Glazed Almonds

Combine 2 cups whole almonds, $\frac{1}{4}$ cup honey, and 2 tablespoons butter in heavy skillet. Cook over medium-low heat, stirring constantly, till almonds are coated and honey has boiled down, about 15 minutes. Stir in $\frac{1}{2}$ teaspoon vanilla. Spread nuts on aluminum foil. Cool. Break into 2- or 3-nut clusters. Sprinkle lightly with salt.

Peanut Butter-Honey Dip

Blend $\frac{1}{2}$ cup crunchy peanut butter with $\frac{1}{4}$ cup honey. If necessary, add more peanut butter or honey until consistency is suitable.
Cut apples into wedges.
Dip wedge and enjoy.

Honey Mints

1 cup warm honey
4 drops oil of peppermint
green food coloring
 $2\frac{3}{4}$ cups powdered milk (non-instant)

Mix ingredients and knead until all milk is absorbed. Roll into balls and set on foil or parchment. (A quick squirt of cooking spray on both hands helps so the mixture does not stick to the hands.)

Lemonade (for 4 people) (from honey.com)

6 tablespoons honey ice cubes
1 cup lemon juice 1 quart carbonated water
1 lemon, thinly sliced

Dissolve honey in lemon juice. Add lemon slices and refrigerate until ready to use. Fill 12-ounce glass with ice cubes add $\frac{1}{4}$ cup lemon juice mixture and fill glass with carbonated water.

Kaleidoscope Honey Pops (from honey.com)

2 ¹/₄ cups water

³/₄ cup honey

3 cups assorted fruit, cut into small pieces

12 3-oz. paper cups

12 popsicle sticks

In a pitcher, whisk together water and honey until well blended. Place ¹/₄ cup fruit in each mold. Divide the honey-water mixture between cups. Freeze until partially frozen, about 1 hour. Insert popsicle stick; freeze until firm and ready to serve.

Honey Glaze for barbequed meats

Combine and mix well:

1 cup apricot, cherry or peach preserves ¹/₂

cup clover honey

2 tablespoons orange juice

Brush on chicken while barbequing.

Beauty Aides with Honey (from honey.com)

Mix 1 tablespoon of honey with 2 tablespoons finely ground almonds and ¹/₂ teaspoon lemon juice. Rub gently on face. Rinse off with water.

In blender, puree 1 tablespoon honey with a peeled, cored apple. Smooth over face: leave on 15 minutes. Rinse with cool water.

Mix 1 teaspoon honey with 1 teaspoon vegetable oil and ¹/₂ teaspoon lemon juice. Rub into hands, elbows, heels and anywhere that feels dry. Leave on 10 minutes. Rinse off with water.

Wax Products

Basic Lip Gloss Formula (from The Good Earth Bath, Beauty & Health Book, page 92)

1 teaspoon beeswax

1 teaspoon petroleum jelly

¹/₂ teaspoon aloe vera gel

¹/₂ teaspoon apricot kernel oil

Melt the beeswax, then remove from heat and add the petroleum jelly and aloe vera gel right away. Stir for 1 to 2 minutes until completely

dissolved. Add the apricot kernel oil and stir for another minute. Pour into pots and use over lipstick or alone for a "movie star" shine Store in a cool, dry place. Optional add-ins: small chunk of lipstick for color and glitter for extra sparkle.

Wax Crayon Prints

Materials:

Warming tray, set on low or medium/low
Foil
Peeled crayons
Paper (many types)
Roll of paper towels
Cloth rags

Instructions:

Cover tray with foil.
Draw directly on foil with crayons. (The crayons will melt as it warms while student draws.)
Lay paper on completed design. Rub lightly with a rag.
Remove paper.
Wipe off foil with a paper towel for the next student to work.

Variations:

Tape paper to foil and draw directly onto paper.
Use fabric(unbleached muslin) as you would the paper.
Use fabric crayons. Follow directions on box.

Beeswax Candles I

Materials:

Colored sheets of beeswax (8 1/2" x 16 3/4") in various colors
Wick cord (size 1/2" or smallest diameter available)
Metal ruler or straight edge
Craft knife
Hair dryer (must use when weather is cooler and sheets aren't as pliable)

Straight Candle Instructions:

Use a straight edge and craft knife to cut each sheet into

approximately 2" strips.

Separate.

Cut wicks 2 1/2" long (3/4" longer than short side)

Lay wick along a short edge and gently press onto the beeswax. Starting with the wick edge, roll up the candle. Watch to keep the top and base edges fairly even. Press the free edge into the side of the candle to secure it. Smooth the edge in place with your fingers.

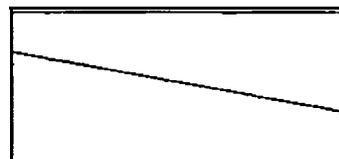
Tapered Candle Instructions:

Use a straight edge and craft knife to cut sheet into two equal

but not rectangular pieces Separate.

Cut wick 1/2" longer than tallest of the short sides

Lay wick along that edge and gently press onto the beeswax.



Starting with the wick edge, roll up the candle. Watch to keep the base edges even.

Press the short edge into the side of the candle to secure it. Smooth the edge in place with your fingers.

Note: The tighter the roll, the longer the candle will burn.

Beeswax Candles II

Materials:

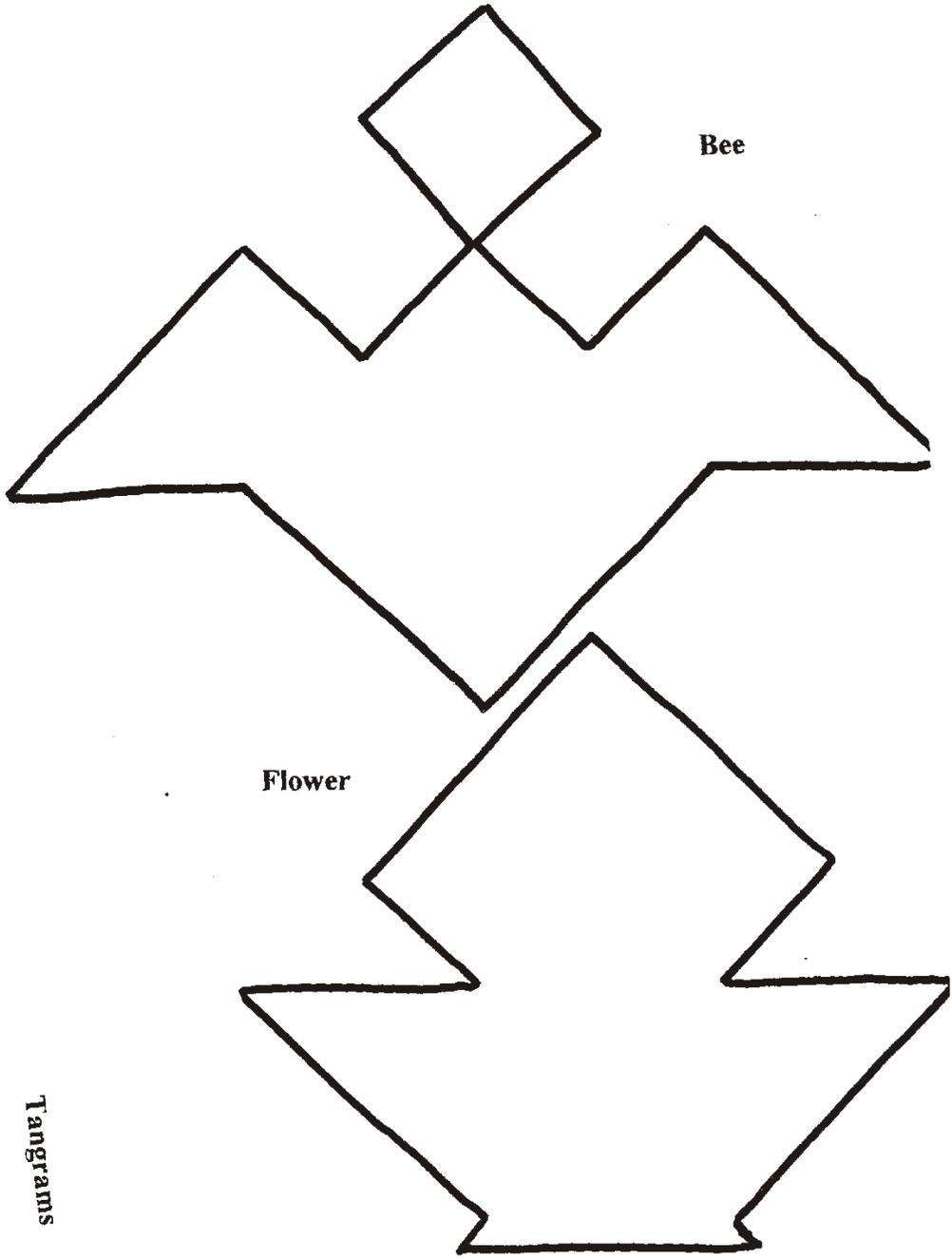
5" x 1" or 1 1/2" utility candles, enough for each student
beeswax sheets, different colors
sequin shapes and sequin pins
cookie cutters like of stars and hearts or dinosaurs
glitter
glitter glue tubes

Instructions:

Cut chosen color of beeswax sheet just big enough to go around the candle. Wrap candle. Using a cookie cutter, cut shapes in other colors. Press onto candle.

Or pin sequin shapes to covered candle. Roll candles in glitter to add sparkle or shake glitter on using a salt shaker.

Or press small scraps of wax sheets on candle with edges touching. Cover the entire candle. Outline each piece and around the bottom with colored glitter glue. Black, silver, or gold would be basic colors to use, but having additional colors will give students more options.



Bee

Flower

Tangrams