



South Carolina 4-H

Pollinator Program

A CLEMSON® EXTENSION PROGRAM

Honey Bee Project *Record Book*

Senior: Ages 14-18



I pledge my



HEAD

to *clearer thinking,*

my



HEART

to *greater loyalty,*

my



HANDS

to *larger service,*

and my



HEALTH

to *better living*

for my club, my community, my country, and my world.

Honey Bee Project

Record Book

Senior (ages 14-18)



South Carolina 4-H

Pollinator Program

A CLEMSON® EXTENSION PROGRAM

Name: _____

Birthday: _____ Age as of January 1 (of the current 4-H year): _____ Grade: _____

Mailing Address: _____

City: _____ State: _____ Zip: _____ 4-H County: _____

Phone: () _____ Email: _____

By signing below, you state that the 4-H member has completed this record book and the information presented is correct to the best of your knowledge.

Participant Signature: _____ Date: _____

Parent Signature: _____ Date: _____

To be completed by the County Extension Office:

Check appropriate 4-H region:

- ☐ Upstate
- ☐ Midlands
- ☐ Pee Dee
- ☐ Savannah Valley

An evaluation was submitted
with this record book:

- ☐ Yes
- ☐ No

4-H Agent

Signature: _____

Date: _____

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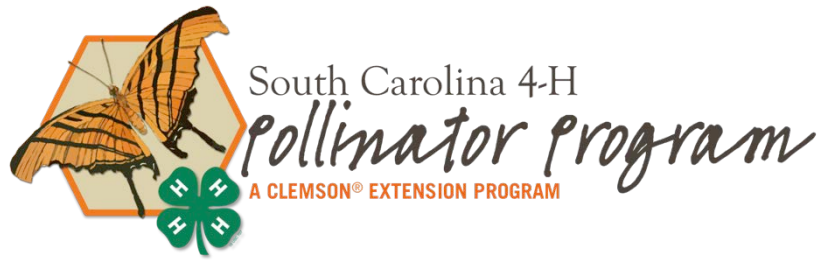
Information was gathered from the Clemson University Cooperative Extension, South Carolina 4-H, National 4-H Council, and National 4-H Headquarters websites, or as otherwise referenced.

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Terms in **orange** throughout the record book are defined in the glossary.

Honey Bee Project



Introduction to 4-H

In 4-H, we believe in the power of young people. We see that every child has valuable strengths and real influence to improve the world around us. We are America's largest youth development organization—empowering nearly six million young people across the U.S. with the skills to lead for a lifetime.

4-H is delivered by Cooperative Extension—a community of more than 100 public universities across the nation that provides experiences where young people learn by doing. Kids complete hands-on projects in areas of health, science, agriculture, and citizenship in a positive environment where they receive guidance from adult mentors and are encouraged to take on proactive leadership roles. Kids experience 4-H in every county and parish in the country—through in-school and after-school programs, school and community clubs and 4-H camps.

Based on their interests and guided by adult mentors, youth develop their own pathway in 4-H. They select from a broad menu of local 4-H programs. There are hands-on and learn-by-doing opportunities for everyone.

**“Making
the
Best
Better.”**

4-H Motto

“I pledge
my *Head* to clearer
thinking,
my *Heart* to greater
loyalty,
my *Hands* to larger
service, and
my *Health* to better
living
for my club, my
community, my
country, and my
world.”

4-H Pledge

**“Learn
by
Doing.”**

4-H Slogan

Essential Elements of 4-H Youth Development

The essential elements of 4-H youth development are the underlying principles that we embed in programs, curricula, and learning opportunities to promote positive youth development. Regardless of the project area, youth need these four essential elements to develop to their fullest potential with a variety of experiences.

belonging: a positive relationship with a caring adult; an inclusive, safe environment.

mastery: engagement in learning: opportunity for mastery.

Independence: opportunity to see oneself as an active participant in the future; make choices.

Generosity: opportunity to value and practice service to others.

Experiential Learning Model

In 4-H, supportive, caring adults help youth discover what they are learning with minimal guidance. Part of their experience is to learn and discover on their own and to pursue deeper understanding to be able to apply what was learned in other life situations. We encourage youth to seek, and adults to provide, mentoring in life- and technical skill development through use of a **five-step experiential learning model**.



Introduction to South Carolina 4-H

South Carolina 4-H Youth Development is the youth component of Clemson University Cooperative Extension, fulfilling our land-grant mission by taking research-based knowledge and educational resources to our state's youth, ages 5-18 years. The 4-H Program uses a learn-by-doing approach and involvement of caring adults to empower youth to become healthy, productive, and contributing members of society. Local 4-H Programs and opportunities often vary by county. To find out more information about ways you can be involved with 4-H in your area, contact your local Cooperative Extension Office: <http://www.clemson.edu/extension/co/index-new.html>

We offer a wide variety of experiences and opportunities to get involved with 4-H. There are six program areas in South Carolina 4-H, each with their own projects and events for youth to participate. To receive more information on these state-level 4-H opportunities, visit: www.clemson.edu/4h



As of the 2014-2015 club year, South Carolina 4-H had over 90,000 youth enrolled!

Nationally, there are more than 6 million 4-H'ers with an estimated 25 million 4-H Alumni.

We are so glad to have you as a part of this national and international organization!



Introduction to the Honey Bee Project

Overview

One component of a South Carolina 4-H Pollinator Program, the Honey Bee Project is an independent-study project that engages youth in the active role of beekeeping, learning the basics of entomology, and gaining an appreciation for pollinators in our world.

Objectives

Youth involved in the South Carolina 4-H Honey Bee project will:

- Set goals and plan activities and strategies to achieve those outcomes, even in the face of challenges.
- Reflect on their yearly work by documenting skill development and learning experiences.
- Give back to their communities through educational and service activities.
- Learn valuable skills in record keeping, financial management, and written communication.
- Become good stewards of the environment and gain technical expertise that can promote beneficial practices.

Guidelines

- Age Divisions: (all ages are calculated on January 1 of the current 4-H year)
 - Cloverbud, 5-8 years of age
 - Junior, 9-13 years of age
 - Senior, 14-18 years of age
- The club year runs from September 1 to August 31.*
- Each youth will receive two copies of the project record book. One may be used as a draft copy and the other may serve as the final product that is turned in at the end of the project. **Only ONE record book can be submitted for each participant.**
 - You must return the included evaluation to be eligible for awards earned!
 - We strongly advise youth to find a 'mentor', an experienced beekeeper, to work with during this project.
 - We understand that beekeeping often requires the management of multiple colonies or hives. We encourage this, but only want youth to report on ONE managed colony during the project season.

Timeline

- First Friday in February: Your registration and payment must be received by 4-H.
- May 1st: Your hive must be installed in your apiary.
- First Friday in August: Your record book must be received by 4-H.
- September - October: County, regional, and statewide winners will be announced.

Introduction to Beekeeping

Beekeeping is rapidly growing in popularity as a hobby and a vocation (i.e., job or career). It is a fun way to spend your time and it is also a very beneficial (i.e., helpful or valuable) to **agriculture**. Bees produce products like **honey** and **beeswax** that we use directly and are responsible for pollinating up to 70% of our agricultural crops according to the United State Department of Agriculture (USDA). **Apiculture** is the human practice of actively managing honey bee **colonies**, also known as **hives**. The art of beekeeping cannot be taught purely from a book. It has to be experienced.

Safety

Protective gear is standard precaution against bee stings. Protective gear includes veils, gloves, close-toed shoes, and loose-fitting, long-sleeve and long-pant clothing. However, bee stings can and do occur when working with active colonies, even through protective gear. It is important to know whether or not you are allergic to bee stings and to be prepared for an emergency in any situation. Talk to your family doctor or pediatrician about your risk and options for epinephrine injections.

Bees are generally easy going, but certain actions of the beekeeper, weather conditions, or various other factors can affect the way a colony behaves. Even if bees are not aggressive, you can still get stung when you accidentally crush one. It's almost impossible not to when working with that large number of bees. Although it does not happen often, getting stung becomes a "when", not an "if", for many beekeepers.

Therefore, when a bee stings you, it is important to know what to do. Do not pull out the stinger with your fingers! Pinching the stinger with your fingers will cause more venom to be injected into the skin. Instead, use an object, such as fingernail, hive tool, or credit card, to scrape the stinger out of the skin. It will probably hurt for about 20 seconds and then the pain should subside. It is not uncommon for the site of the sting to be red or swollen for a day or two also. Signs of a severe allergic reaction are important to recognize! If you or someone with you gets stung and has the following symptoms, seek medical attention immediately: difficulty breathing or swallowing, swollen lips, face, or throat, nausea or vomiting, or dizziness or fainting.

NOTE: If you are allergic to bee stings and still want to participate in this project, work with your 4-H Agent and the project coordinator to complete this record book without putting yourself in harm's way.

Picture of Safety! Draw a self-portrait demonstrating good protection from bee stings.

Goal Setting

For this project, you will manage one hive. Name at least two goals you would like to achieve by participating in this project, as well as an action you will take to achieve each goal. In addition, think of pitfalls (i.e., problems) or potential limitations that may prevent you from achieving your goals. ***Use the table below to write your goals, actions, and pitfalls.***

	Goal	Action	Pitfall
Example	Learn to identify varroa mites in my hive	Study pictures, work with a knowledgeable beekeeper, and look for signs of mites in my hive	If I do not use a specific test for varroa mites, I may not be able to identify them on moving bees.
1			
2			
3			

Importance of Pollinators

Pollination is the movement of pollen (containing the plant's genetic material) from one flower to another. It is often accomplished by insects, but many plants are pollinated by other animals, such as birds and bats, or by the wind. Animals forage (i.e., feed off of in a traveling pattern) the **nectar** and **pollen** of flowering plants. As animals move from flower-to-flower and plant-to-plant, they transport the genetic material of plants with them, aiding in plant **reproduction**. If a plant is successfully fertilized with pollen, it can bear fruit and seeds.



Pollinators, the animals responsible for pollinating plants, are an integral (i.e., important or vital) part of agriculture. Honey bees are good pollinators because they spend a very high percentage of their lifetime foraging for nectar and pollen. Pollination events increase both the quality (i.e., shape, size, uniformity) and quantity (i.e., number) of fruits



and vegetables (Figure 1). Additionally, native plants benefit from pollination by receiving pollen from plants of the same species, which helps to maintain genetic diversity within a wild population. Honey bees have survived and even thrived for thousands of years as wild and cultivated (i.e., nurtured or managed) colonies. However, according to the USDA's National Agricultural Statistics Service (NASS), the number of honey-producing bee colonies has been decreasing in the U.S. for several decades. Colony Collapse Disorder (CCD), identified in 2006, has also been a cause of big concern, as well as the introduction of parasites and **pests** to honey bee colonies in the U.S. A first for bees of any kind, 7 species of native Hawaiian bees were added to the U.S. Endangered Species list in October 2016. In addition, the rusty patched bumble bee was added to the list in January 2017 (www.fws.gov). Therefore, it is more important than ever for **beekeepers** to be knowledgeable, responsible advocates (i.e., promoters or supporters) for pollinators and the environment.

Figure 1. A partially pollinated cucumber (left) compared to a completely pollinated cucumber (right). The seeds did not form and consequently the fruit did not grow throughout the poorly pollinated cucumber. Image credit: Penn State Extension

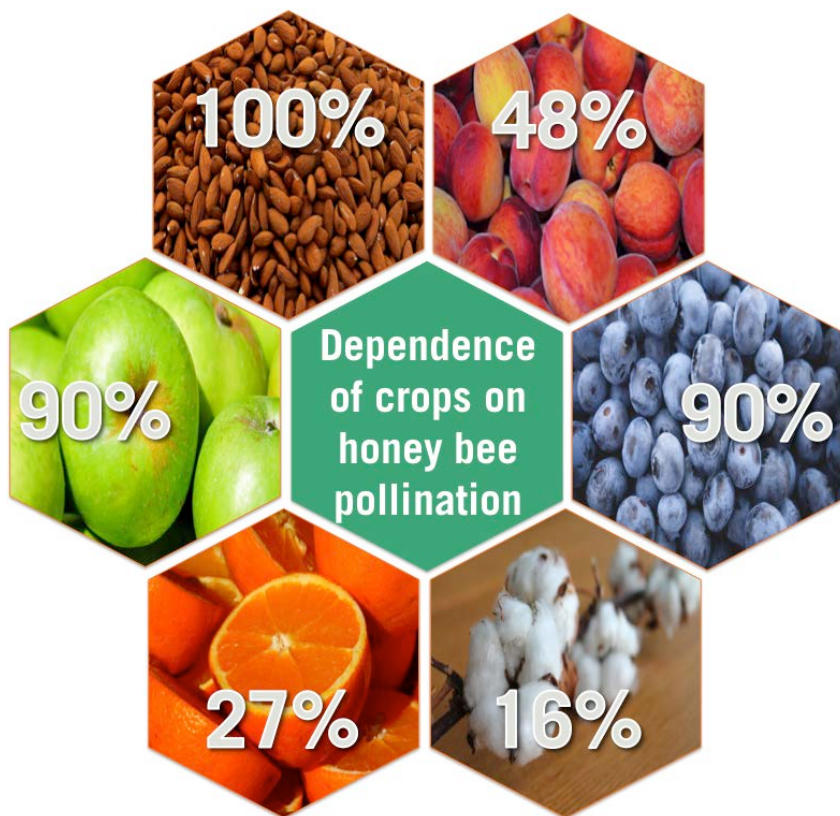


Figure 2. Bees are responsible for pollinating 70% of crops. Almonds, peaches, blueberries, cotton, oranges, and apples (clockwise from top left) are agricultural crops that are particularly dependent on pollination according to the USDA. Percents represent each crop's dependence on pollination by honey bees.

Although we usually think of honey as the primary product of managing honey bees, the most important role of bees is the pollination they provide for agricultural crops! In the U.S., the value of bee pollination to crops is estimated to be \$12 billion (Johnson and Corn, 2015) and the value of honey produced in 2015 was only \$327 million (USDA NASS, 2016). Agricultural crops that benefit from bee pollination are most of our fruits, vegetables, nuts, some raw fibers, and even flowering forage for livestock like clover, field beans, and other cover crops (Figure 2). Therefore, bees not only provide us honey as sweet treat, but also help fill our plate and clothe us on a daily basis!

In the space below, draw and describe one agricultural crop you enjoy that honey bees are responsible for pollinating.

Basics of Entomology

Entomology is the study of insects. **Insects** are a class of invertebrates within the arthropod phylum that have a chitinous exoskeleton, a 3-part body (head, thorax and abdomen), 3 pairs of legs, and generally 1-2 pairs of wings.

Are honey bees insects? (Check a box.) ☐ Yes ☐ No

Label the illustration below with the following terms: antennae, forewing, hindwing, pollen basket, compound eye, thorax, abdomen, stinger, mandible. The term “head” has been labeled for you as an example.



Have you ever wondered why *honey bee* is spelled with two words and other animals, like *dragonfly*, are spelled with one?

Honey bee is spelled with two words because *honey* is an adjective used to describe the type of *bee*. Honey bees are true bees. Dragonflies are **not** true flies; they are insects belonging to the order 'Odonata'.

Honey bees have a social, **caste** structure that they follow. There are three kinds of adult bees within a colony with various numbers and roles within the hive. ***In the spaces provided below, describe the roles of worker, drone, and queen bees and how you can visually tell them apart.***

Thousands of female workers

role:

Description:



Hundreds of male drones

role:

Description:



One queen bee

role:

Description:



Identify the different kinds of adult bees in a colony.

Find the queen!

Can you find the queen? **Circle the queen.**



**Did
you
know?!**

It takes
12 bees their
entire life to make
1 teaspoon of
honey.

There are between
30,000 – 60,000
bees in a colony.

The lifespan
of a **queen** can be
2 – 8 years!

circle all the drones!

How many drones can you
find in the picture? **Write the
number of drones you circled
on the line below.**



Pest and Predator Control

Part of being a beekeeper is managing (i.e. dealing with) pests and **predators** that might try to take advantage of the hard work your bees are doing! Honey-bee pests are insects or other animals that feed off of the bees' products or the bees themselves. Pests can also spread diseases, weakening individual bees or the entire colony! ***List at least four parasites or pests that commonly affect honey bee colonies in our area:***

1. _____

3. _____

2. _____

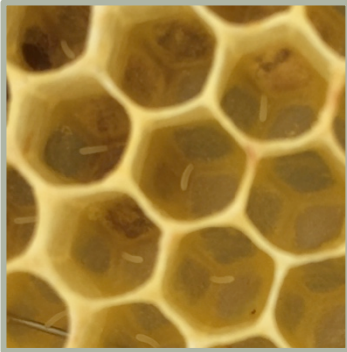
4. _____

Pick one parasite or pest you listed above and describe how you can control it your hive?

The **honeycomb** in a hive will contain one of three things: honey, pollen, or **brood**. Honey-bee brood develops in stages, consistent with the lifecycle of an insect, and takes approximately three weeks.



Timeline for a worker bee:
(day 0 – 3)



(day 4 – 10)



(day 11-20)



(day 21)

Using the series of 3 pictures above, draw a line and label the developmental, life stages shown: **egg**, **larva**, **pupa** or **capped brood**, and new adult.

At any one time in a hive, there are usually honey bees in every life stage. For instance, there are eggs, larvae, pupae, and adults. How does this affect the way we treat for pests and parasites in a hive?

Did you know?!

Queens can determine the gender of their offspring by selecting to fertilize or not fertilize each egg. Fertilized eggs become *females*, while unfertilized eggs become *males*, drones.

All bees are vegetarians. Honey bees may fly three miles or more from the hive in search of food. They eat pollen for protein and nectar for a carbohydrate source. Pollen and nectar also supply bees with vitamins, minerals, lipids, and antioxidants!

Starting your Project Hive

Don't forget, your project hive must be installed in your apiary by May 1st!

What type of hive are you using? *(Check all that apply.)*

☐ Langstroth ☐ Top-Bar ☐ Flow ☐ Warre ☐ Other: _____

Why did you choose this style? _____

Describe your initial hive set-up (number and size of boxes, frames, etc.): _____

Are there other hives in your **apiary**? ☐ Yes ☐ No If so, how many? _____

Where is your apiary located? _____ (City, State)

Describe the location of your apiary and features that are present within a 3-mile radius.
*(Check **all** that apply.)*

☐ At your residence ☐ On land owned by your family ☐ On land owned by a friend

☐ At a community or business location ☐ Other: _____

☐ In a wooded/shaded area ☐ In a sunny area ☐ Area with a mix of sun and shade

☐ Near forestland ☐ Near wetlands ☐ Near natural areas/unmanaged land

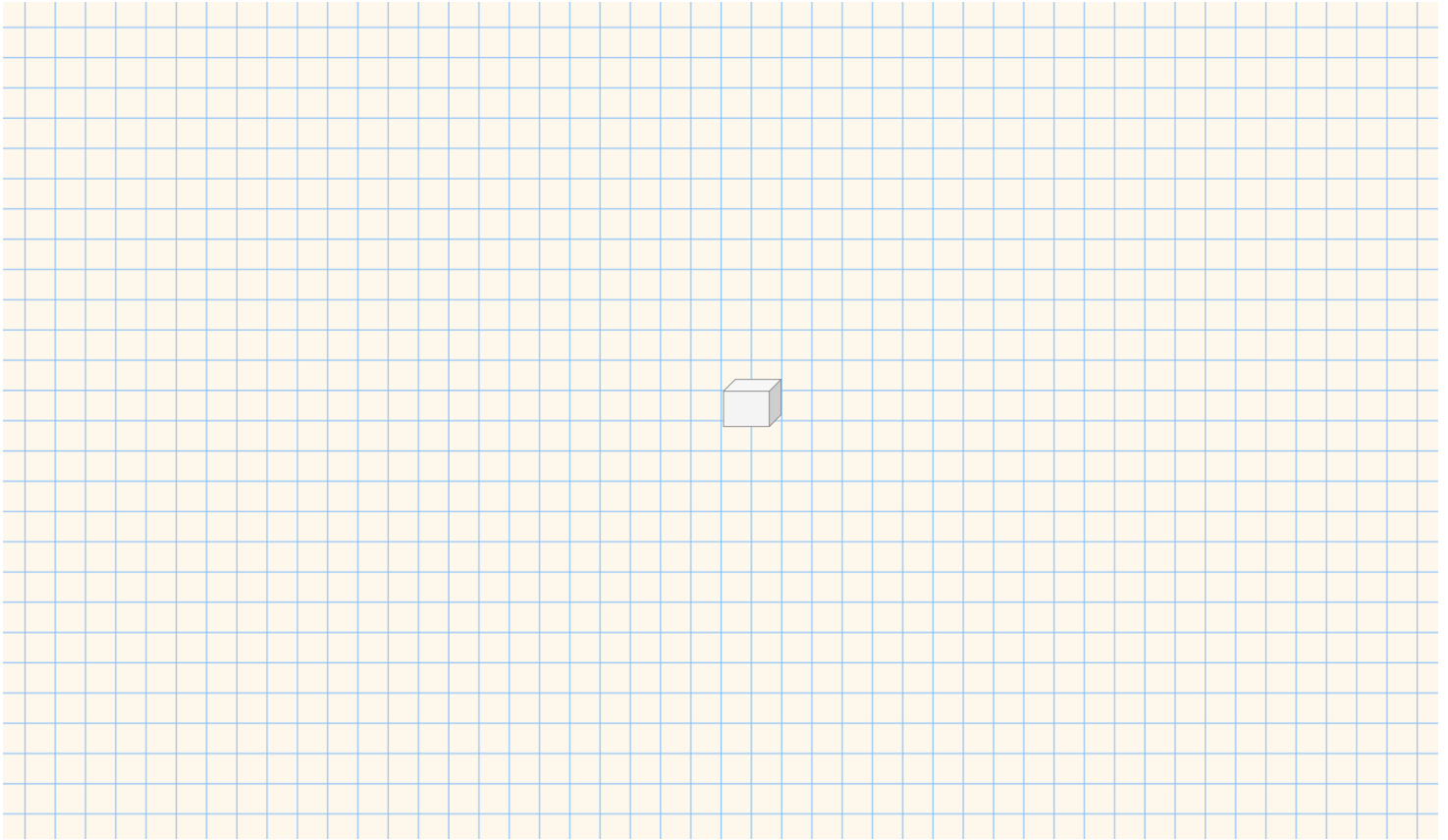
☐ Near grass, pastureland ☐ Near agricultural crops; what crop(s)? _____

☐ Near subdivisions ☐ Near a golf course ☐ Near gardens (vegetable or flower)

☐ Near rivers or streams ☐ Near ponds or lakes ☐ Near swimming pools

☐ Other: _____

In the grid below, draw or paste an aerial map of where your apiary is located. The map needs to depict features like those mentioned on the previous page and show a surrounding radius of 3 miles (6 miles in diameter). Make sure to include a key, compass, and scale. The center of the map is marked to represent your apiary.



Where did your bee colony come from? (Check **one** box.)

☐ Existing ☐ Split ☐ Package ☐ Nuclear Hive ☐ Swarm ☐ Other: _____

Why did you choose this source? _____

What is the race or genetic background of your honey bee colony? (Check **all** that apply.)

☐ Italian, *Apis mellifera ligustica* ☐ Russian, *Apis mellifera caucasica*
☐ Carniolan, *Apis mellifera carnica* ☐ German Black Bees, *Apis mellifera mellifera*
☐ Africanized, *Apis mellifera scutellata* ☐ Unknown ☐ Other: _____

What date did you install or start working with your bees? _____

Flowering Plants and the Nectar Flow

As temperatures warm up in the spring, bees will begin to emerge from the hive and start looking for food sources. **Identify and describe at least 4 flowering plants bees foraged on at different times (early, middle, and late) throughout the project season.**

<i>early</i>	Name of plant: Type of plant: (tree, shrub, flower, etc.) Dates blooming: Description:	
<i>middle</i>	Name of plant: Type of plant: (tree, shrub, flower, etc.) Dates blooming: Description:	
<i>late</i>	Name of plant: Type of plant: (tree, shrub, flower, etc.) Dates blooming: Description:	
<i>your choice</i>	Name of plant: Type of plant: (tree, shrub, flower, etc.) Dates blooming: Description:	



Maintaining your Project Hive

Your colony will grow and change over a season. Keeping track of what is going on with your bees is a very important way to recognize when it is time to feed your bees, to give your bees more space, to treat for pests, to replace a queen, to harvest honey, and to complete other management tasks. You do not have to open your hive and go through it every time you want to look at your bees. Record your observations of bees coming and going from the hive in the notes section, as well as to describe what flowers the bees are foraging on. ***Use the maintenance chart below to keep track of your project honey bees.***

Date & Time	Weather	Hive Configuration	Queen Status	Frames of Bees*	Brood Pattern**
<i>Example</i> 7.7.2017, 4:00pm	86°F, dry (no rain in forecast)	1 deep box, 1 super 10 frames each	Not seen, but eggs & capped brood present	8 of 10	4
Notes: Hive looks good. A few adult hive beetles under the top cover. Center frames of top super contained capped honey. Added a queen excluder above the super and added a 2 nd super. Bees were very active on the white clover all over our yard!					
Notes:					
Notes:					
Notes:					
Notes:					
Notes:					
Notes:					

*After gently smoking your bees, open the top box from the bottom and look up at the underside of your frames. Estimate the number of frames that are completely covered by bees.

**Rate your brood pattern on a scale of 1 (worst, very spotty with lots of open cells) to 5 (best, solid covering of capped brood with few open cells).

18 Date & Time	Weather	Hive Configuration	Queen Status	Frames of Bees	Brood Pattern
Notes:					
Notes:					
Notes:					
Notes:					
Notes:					
Notes:					
Notes:					
Notes:					
Notes:					

Date & Time	Weather	Hive Configuration	Queen Status	Frames of Bees	Brood Pattern
Notes:					
Notes:					
Notes:					
Notes:					
Notes:					
Notes:					
Notes:					
Notes:					
Notes:					

Add additional pages if needed and attach them to the inside of the back cover.

Mastering the Art of Beekeeping – Learning

Learning is a life-long process and you have the opportunity to learn something new every time you look in a hive. Besides working directly with your project bees, what activities have you done to improve your knowledge and skills related to natural resources, pollinators, or beekeeping? This could include, but is not limited to, reading books, journals, and magazine articles; shadowing an experienced beekeeper; watching videos, tutorials, and demonstrations; taking classes, touring pollinator gardens and apiaries, joining a beekeeping club or association, and participating in workshops or clinics. **List your learning activities during this project.**

	Date	Activity
Example	7.10.2017	Attended the local beekeeper's association meeting. Learned about hygienic races of bees.
1		
2		
3		
4		
5		
6		
7		
8		

Mastering the Art of Beekeeping – Demonstrating

Not only is it important to learn, but it is also important to share our knowledge and skills with others! What have you done to educate others or share your skills with others in the community? You could give demonstrations, present your project at show-and-tell or at your 4-H club meeting, install a pollinator garden at your local church or park, write an article for the newspaper or 4-H newsletter, donate honey to a food bank, and much, much more! **List your service and educational activities during this project.**

	Date	Activity
Example	7.12.2017	Brought beeswax to vacation bible school at my church and led a group in making bee-related crafts.
1		
2		
3		
4		
5		
6		
7		
8		

Harvesting Honey

The end goal of a lot of beekeepers is harvesting honey! ***Fill in the following information to tell us about your honey.***

Were you able to harvest honey from your bees? (Check **one**.) ☐ Yes ☐ No

If no, explain why not: _____

Describe your extraction process (where, when, extraction method, who helped, filtration or straining, bottling):

How much honey did you extract? _____ lbs _____ gal.
(Provide approximate amount in gallons **and** pounds! Note: 1 gallon of honey weighs about 12 pounds.)

Did you measure the water content or density of your honey? (Check **one**.) ☐ Yes ☐ No

Explain: _____

Describe your plans for the honey (sell, keep, use, give away, etc.): _____

Discuss any other products of your honey bees that you have plans for (beeswax, comb, rearing and selling queens, making splits, etc.): _____

Financial Records

List any expenses (i.e. money spent) you had during the project this year. This could include the project registration fee, equipment (hive boxes, construction materials, protective wear, hive tools, etc.), sugar, water, books, beekeeper association fees, etc. Provide copies of your receipts.

Date	Description of Expense	Dollar amount
2.3.2017	Project registration fee	40.00

overall project expenses

What was your net project profit? _____

Net profit can be calculated as overall project expenses minus income (on the next page).

List any income (i.e. money gained, revenue) you earned during the project this year. This could include sales from honey, bees, and bee-related products (soaps, lip balms, raising queens, splits, etc.) or services.

Date	Description of Income	Dollar amount

overall project income

In addition to your overall project income and expenses, you also are likely to have assets (i.e. property or equipment of value) and unsold inventory. **List them below.**

Assets	Dollar value

Inventory	Dollar value

Honey Bee Research

Each year, a current topic related to pollinators or apiculture is chosen for you to showcase your existing knowledge and ability to research information. The research question for you to answer will be posted on the South Carolina 4-H Honey Bee Project webpage and shared in the project newsletter. ***Write your response to the research question in the space below and cite your sources of information.*** Some research questions may be controversial, without a clear answer. You are welcome to share your personal opinion on a topic, but be sure to also include research-based information that supports your stance.

Project Story

This is your chance to describe your personal connection and interest in the project. You can answer questions like:

- Why did you participate in this project?
- How long have you been interested in honey bees?
- Who first introduced you to beekeeping?
- Who served as your mentor or an experienced beekeeper that helped you during this project?
- What did you do with the seed packet we gave you?
- What did you learn? (Will you do anything differently next year?)
- What other things do you do in 4-H?
- Also, be sure to address the goals you set at the beginning of the project. Did you meet those goals? Why or why not?

Share your project story in the space below (hand-written or attach a typed document). Or, if you choose, you may make a video of your project story and upload it to YouTube.

Share the public or unlisted link here: _____

Pictures

Use the space on the next two pages to attach pictures of you performing actions documented in this record book (at least 5 pictures). Be sure to include dates and captions to describe each picture! (Ideas for pictures: protective wear, your apiary, installing your hive, the flowers bees really liked, queen, pests or parasites in your hive, harvesting honey, making other bee products, teaching others about your project, installing a pollinator garden, learning about bees, etc.)

Glossary of Terms

Agriculture: the science, art, or practice of cultivating the soil, producing crops, and raising livestock for products.

Apiary: a place where bees are located; *especially* a collection of hives or colonies of bees kept for their honey

Apiculture: the keeping of bees; *especially* on a large scale

Beekeeper: a person who raises bees

Beekeeping: the science, art, or practice of cultivating bees

Beeswax: wax; a yellowish, moldable wax substance produced by bees and used by them for making the honeycomb

Brood: the young of an animal or a group of young; *especially* the young belonging to a bird or insect that is hatched or cared for at one time

Caste: a specialized form of insect that carries out a particular purpose in the colony; *especially* in ants and bees

Colony: a group of individuals with common characteristics or interests situated in close association; *especially* a group of bees living together as a unit

Drone: a stingless male bee that has the role of mating with the queen and does not gather nectar or pollen

Egg: a reproductive body produced by the queen that is capable of development into a new individual

Entomology: the science of studying insects

Hive: the physical container for housing honey bees; *or*, a colony of bees

Honey: a thick, sugary substance produced by bees from the nectar of flowering plants

Honeycomb: the hexagonal (6-sided) wax chambers built by honey bees for the storage of honey, pollen, and brood.

Insect: any of a class of arthropods with the body clearly divided into a head, thorax, and abdomen, with three pairs of jointed legs, and usually with one or two pairs of wings

Larvae: brood that has hatched from an egg; young wingless forms

Nectar: the sugary liquid collected from flowering plants by pollinators. Bees convert the nectar to honey, the insects' primary source of carbohydrates. Honey provides the bees with the energy for flight, colony maintenance, and general daily activities.

Pest: a plant or animal that is detrimental to humans or human concerns; *especially* those affecting agriculture or apiculture

Pollen: the microscopic, powdery material collected from the stamen(s) of a flower that contains the male genetic material of a plant. Pollen is the bees' main source of protein. Pollen also provides the bees with fatty acids, minerals, and vitamins. The protein in pollen is necessary for hive growth and young bee development.

Pollination: the movement of pollen (containing the plant's genetic material) from one flower to another. It is often accomplished by insects, but many plants are pollinated by other animals, such as birds and bats, or by the wind.

Predator: an organism that obtains its food by primarily killing and consuming animals

Pupae: developing organisms that are in a quiescent (i.e. sleep-like) stage of development before hatching into adult forms

Queen: the fully developed, fertile female of social insects whose function is to lay eggs

Reproduction: the process by which plants and animals produce offspring

Worker: any of the members of a social-insect colony that perform most of the labor and protective duties

Evaluation

We need your help in order to improve the programs we offer! You are being given this survey because you are part of a 4-H program or project, and we are surveying young people like you to learn about your experiences. ***In order to be eligible for any awards earned, you must return the included evaluation when you submit your record book!*** Participation in this survey is voluntary. You may choose to skip any question and your responses will not affect the judging process. If you choose not to participate, please check the "I do not wish to participate" circle.

Honey Bee Project Evaluation

Dear Participant:

You are being given this survey **because you are part of a 4-H program or project**, and we are surveying young people like you to learn about your experiences.

This survey is voluntary. If you do not want to fill out the survey, you do not need to. However, we hope you will take a few minutes to fill it out because your answers are important.

This survey is private. No one at your school, home, or local 4-H program or project will see your answers. Please answer all of the questions as honestly as you can. If you are uncomfortable answering a question, you may leave it blank.

This is not a test. There are no right or wrong answers, and your answers will not affect your participation or place in the program in any way.

Thank you for your help!

If you do not wish to participate in this survey, please indicate that below and return the blank survey to your local Extension Office when you turn in your project record book.

☐ I do NOT wish to participate in this survey.

Survey Starts Here

Please answer the following questions about your experience with the Honey Bee Project.

This was my ☐ 1st ☐ 2nd ☐ 3rd ☐ 4th ☐ 5th time participating in this project.

This project is my first experience with 4-H: ☐ Yes ☐ No

I was involved in beekeeping *BEFORE* this project: ☐ Yes ☐ No

What was your favorite part about this project?

What was your least favorite part of this project?

Is there anything else you would like to share that would help us improve this project?

Cut along dotted line

After your experience with the Honey Bee Project, how strongly do you agree or disagree with the following statements?

<i>The Honey Bee Project...</i>	<i>Strongly Agree</i>	<i>Agree</i>	<i>Neutral</i>	<i>Disagree</i>	<i>Strongly Disagree</i>
Made honey bees more interesting to me.	☐	☐	☐	☐	☐
Helped me learn techniques for managing honey bees.	☐	☐	☐	☐	☐
Allowed me to express my creativity.	☐	☐	☐	☐	☐
Helped me to understand the importance of wildlife in my area.	☐	☐	☐	☐	☐
Increased my knowledge of natural resources.	☐	☐	☐	☐	☐
Made me a better steward of the environment.	☐	☐	☐	☐	☐
Made me appreciate the benefits of honey bees.	☐	☐	☐	☐	☐
Increased the amount of pollinators I saw in my area.	☐	☐	☐	☐	☐
Allowed me to identify plants pollinators used.	☐	☐	☐	☐	☐
Provided me enough information/resources to successfully complete this project.	☐	☐	☐	☐	☐
Gave me “hands-on” experience that will help me with future 4-H projects and activities.	☐	☐	☐	☐	☐
Increased my interest in a natural resources career.	☐	☐	☐	☐	☐

Thank you for your help!!!

Attach additional information here.

If you have additional records, pictures, information, documents, etc. that you would like to share, attach them all to this page. Anything you would like to be seen by the judges must fit inside the record book.





Clemson University Cooperative Extension Service offers its programs to people of all ages, regardless of race, color, gender, religion, national origin, disability, political beliefs, sexual orientation, gender identity, marital or family status and is an equal opportunity employer.