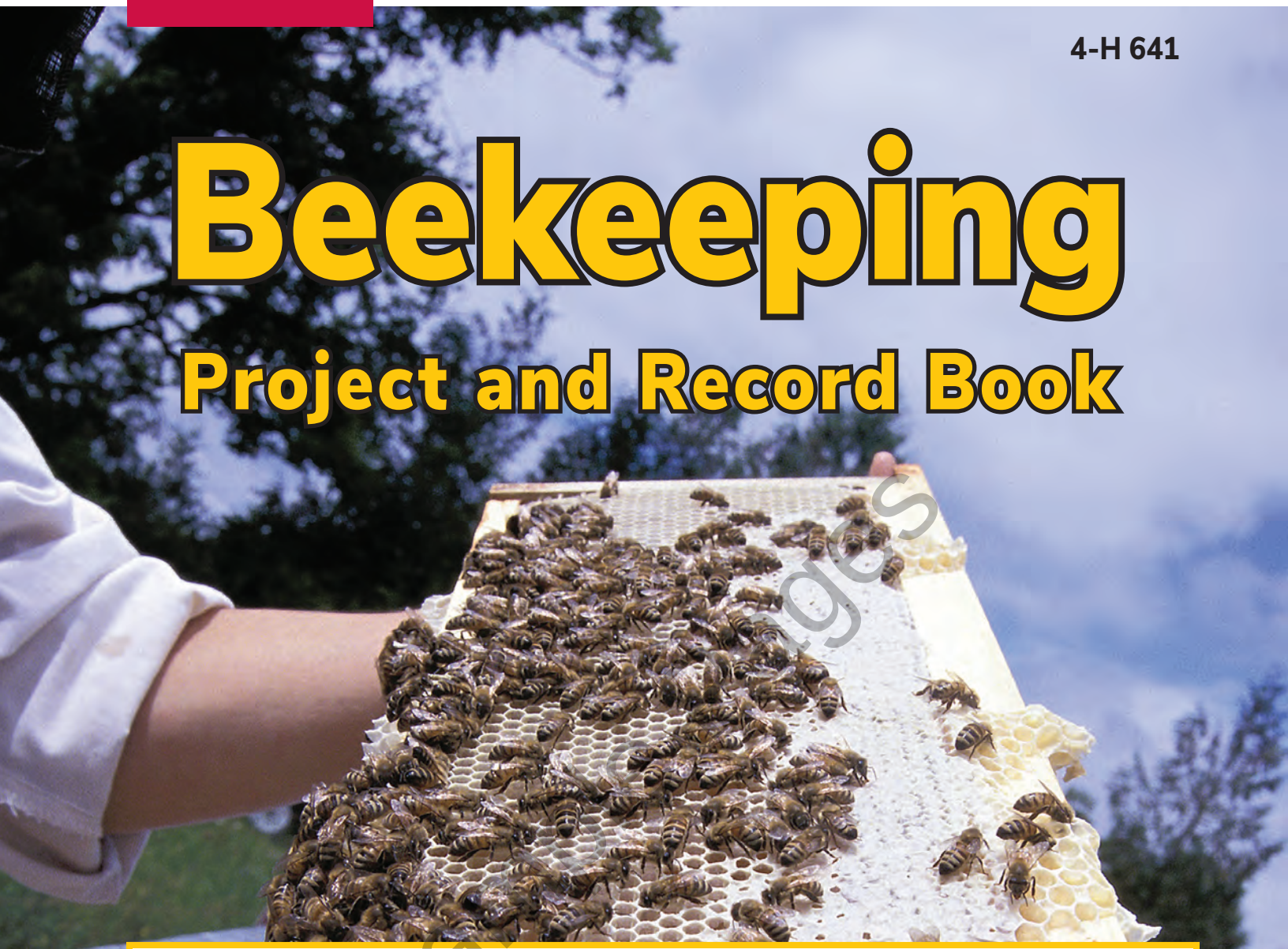
CFAES

COLLEGE *of* FOOD, AGRICULTURAL, *and* ENVIRONMENTAL SCIENCES

4-H 641

Beekeeping

Project and Record Book



Obtain and complete this book each year the beekeeping project is taken.

Name _____

Age (as of January 1 of the current year) _____

County _____

Club or group name _____

Project helper _____

THE OHIO STATE UNIVERSITY
EXTENSION

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Special thanks to Purdue Extension for the 4-H beekeeping series available online.

This 2023 edition features a new design. No changes in the content or in project requirements have been made.

Contents

Note to the Project Helper

Congratulations! A 4-H member or other youth has asked you to serve as a project helper. You may be a family member, project leader, club advisor, or another person who is important in the 4-H member's life. As a project helper, it is up to you to encourage, guide, and assist. How you choose to be involved helps to shape the learner's life skills and knowledge of beekeeping.

Your Role as Project Helper

- Review this *Beekeeping Project and Record Book* and, using the section called Where to Find Information about Bees: Suggested Resources, be prepared to offer guidance on selecting at least one source of information about bees. Some of the suggested resources have scientific and technical information that may be difficult for younger learners to comprehend without your help.
- Guide the youth and provide support in setting goals and completing this project.
- Encourage the youth to apply knowledge from this project book to the care and management of bee hives.
- Serve as a resource person.
- Encourage the youth to go beyond the scope of the 4-H project book to learn more about particularly interesting topics.

Beekeeping Project and Record Book

Every 4-H member completing the beekeeping project must use this *Beekeeping Project and Record Book*. It is designed for members in grades 3 through 12. A new project and record book should be completed each year. Members with more than one hive should copy the Beekeeping Records section so that every project hive has its own set of records.

The Project Guide helps the learner get the most out of the beekeeping project. The 4-H member is required to set goals and complete "learning activities" that pertain specifically to their projects. Learners are encouraged to study particular topics of interest of beekeeping knowledge and the beekeeping industry. They are also encouraged to develop leadership, citizenship, communications, and life skills through "learning experiences" and through "leadership and citizenship activities."

Colony Care and Management is designed to promote awareness of the issues surrounding the care of bees and of being responsible beekeepers. The activities provide hands-on experiences that teach the knowledge and skills needed.

The Beekeeping Records section gives youth the opportunity to develop scientific and basic mathematical skills. Skills such as recordkeeping, comparing and measuring, observing, questioning, and evaluating are examined in the context of owning and managing a project

hive. Activities in this section also give youth the opportunity to develop life skills such as time and money management. If a 4-H member has more than one hive, it is all right to copy the blank record pages. **Begin the project with a complete set of record pages for each hive.** The 4-H member also needs to name or number each hive for ease in identification.

Some concepts and activities in this book are difficult for young learners to grasp. They will require your assistance. Be patient. Help them understand that although an activity may not seem useful, it is designed to help them learn something new and master important skills.

Learning Science

The design of this project and record book uses the latest information on how youth best learn science. The learner experiences, comprehends, and applies information using a variety of science processing skills. The learner:

- Keeps records
- Compares and measures
- Observes
- Communicates with others
- Uses scientific tools
- Evaluates
- Experiments
- Questions
- Conducts research

Experts agree that these skills, once mastered, are applied to other aspects of the learner's life in a way that goes beyond just content recollection. You can support the youth by encouraging effort on activities and records throughout the project experience. Every activity helps the youth learn something new and master important life and science skills.

Getting Started

Are you ready to begin your beekeeping project? The activities in this book invite you to explore the fascinating bee family. Have fun!

Your Project Helper

Before you begin your project, select a project helper. Your project helper can be a parent, project leader, club advisor, or an older friend who knows about beekeeping. Your project helper is someone who can help you if you have difficulty understanding or completing an activity, and who can help you find more information about a topic in which you are interested. After you complete the activities in this book, review them with your project helper. Discuss what you did and what you learned.

Write your project helper's contact information here:

Name: _____

Phone: _____ **Email:** _____

As you complete this project and record book:

- Do your best to answer the questions and complete the activities.
- Think about the ways in which the knowledge you gain applies to the way you care for and manage your bees.
- Work with a project helper to complete the activities in this book. Remember that your project helper is a valuable resource person.
- Look beyond the project books to explore areas of the project that interest you. You can find more information about particular topics from magazines, books, beekeepers, and the internet. Your project helper can help you find more information.

Your Project Level

Use this project and record book for all 4-H beekeeping projects. For each year of the project, you should complete a new book. If you have more than one hive, you should copy the Beekeeping Records before writing on them and complete a set for each one.

There are three project levels:

Beginning—Learners with no experience in a project area, or those who are 8 to 10 years old. Youth at this level are learning about the basics of beekeeping, including types of bees, honey and wax, plants that attract bees, and beekeeping equipment. At this level, youth are not required to have any bees, but are expected to learn about beekeeping firsthand by observing the hive(s) of a local beekeeper.

Intermediate—Learners with some experience in a project area, or those who are 11 to 13 years old. Youth at this level acquire a colony of bees and learn how to care for and manage a beehive throughout the year. A realistic goal at this level is to manage basic beekeeping operations that result in the production of extracted, chunk, or cut comb honey.

Advanced—Learners with experience in a project area, or those who are 14 years old or older. Youth at this level can expect to learn more about honey production, special kinds of honey, bee societies, and bee diseases and parasites.

Project Guidelines

Each year, complete these project components:

1. If you are a 4-H member, sign up for the project by the required date for your county. Contact your club advisor or county Extension office for this date.

The project sign-up date for my county is _____ .

2. Set at least three project goals and objectives.
3. Complete the Project Guide section of this book, including the following:
   - Study **one or more** topics of interest. Topics can be simple or more complex depending on your age and skill level in the project.
   - Complete **five or more** learning activities that support your goals.
   - Participate in **two or more** learning experiences.
   - Take part in **two or more** leadership and citizenship activities.
4. Complete the Colony Care and Management section of this book.
5. Complete the Beekeeping Records section of the book.
6. Take part in a project review at a club or group meeting or on the county level. This project review can take place with your parent or project helper. Ask this person to review your *Beekeeping Project and Record Book* with you. This review helps you evaluate what you have learned.
7. Take part in county project judging. (This step may be optional. Check your county's guidelines.)

Introduction to Beekeeping

Beekeeping as a 4-H project can be fun and rewarding. Whether you want to keep bees as a way to improve pollination, as a hobby, or for harvesting and selling honey and bee products, this project will help you plan for and manage your honey bees. Before we talk about your project, let's talk a little bit about what makes bees so amazing.

Bees have been buzzing around our Earth for millions of years. Thanks to bees, honey has been an easy source of sweetness for people throughout the centuries. Egyptians used honey in many of their medicines. In Spain, 10,000-year-old cave paintings show people stealing honey from a natural hive. For hundreds of years, honey was the main sweetener in American diets. Today we still enjoy honey in all kinds of recipes, from peanut butter and honey sandwiches to honey-glazed chicken.

Do you ever wonder how bees make honey? Or how honey gets from the hive to your local grocery store? To understand where honey comes from, you have to understand bees.

The United States is home to more than 3,500 species of bees. Some are suited to living in man-made hives, others are very protective of their own hives, and others are prone to swarming. Like other insects, bees have six legs, three body segments, and a hard outer skeleton. Bees live in very structured societies called colonies. Although bees within a colony may look alike, they are not all the same. Each of the three basic groups—the ***drones***, the ***workers***, and the ***queen***—has a specific job that helps the colony create honey: their food source and our treat. The European honey bee (what we call our "honey bee"), *Apis mellifera,* is not native to the United States.

What's in a Name? *The European (or Western) honey bee is the best known bee species and one of the best known of all insects. The scientific classification for the honey bee's genus and species is Apis mellifera. Apis is Latin for "bee," and mellifera comes from Latin melli- "honey" and ferre "to bear"—hence the scientific name means "honey-bearing bee." This name was coined by Carolus Linnaeus in 1758. He later tried to change the name to Apis mellifica ("honey-making bee"), but tradition had already set in and the first name stuck.*

Bees communicate with each other primarily using scent to show the location of the best flowers. Bees also communicate when the hive is in danger or when workers are needed to take nectar from bees returning after a successful gathering mission. Bees can even punish other bees that don't follow the rules of the hive.

In addition to producing honey, bees are very important to people because they are ***pollinators.*** Without bees, many of the foods we eat would not exist. Bees spread pollen particles from plant to plant as they visit flowers, making it possible for the plants to produce fruits and vegetables.

People have been beekeeping for centuries, but it wasn't until about the 1850s that beekeeping as we know it today started. In 1851, Lorenzo Lorraine Langstroth, known as the "Father of American Beekeeping," discovered ***bee space,*** the exact space needed for bees to move and work between the honeycombs. Even wild bees have a set bee space in their hives. Langstroth built the first modern beehive, complete with frames for the honeycombs, making it much easier to remove the comb, collect the honey, and check on the hive.

To get started in beekeeping, you need to collect many tools and supplies. Beekeepers often wear jumpers to protect their clothing from ***propolis,*** the sticky resin bees collect to coat and protect the hive. Part of the uniform includes a veil—a large hat with a screen to protect the beekeeper's face from curious bees. Perhaps the most important tool is the ***smoker***. Smoke from the smoker calms the bees down, making it possible for the beekeeper to work without upsetting them. Bees do not usually attack unless they feel threatened.

Honey is only one of the products we get from bees. People also use ***beeswax,*** the substance bees make to create their combs, in candles, lip balm, and soap. Whole honeycombs filled with honey can sometimes be found at local farmers markets. Bee venom is used for medicinal purposes. Even ***royal jelly,*** the food given to the queen by her worker attendants, is used in beauty products.

Where to Find Information about Bees

Suggested Resources

Many good sources of information about beekeeping exist. You may be interested in using the beekeeping project books that are offered online by Purdue Extension, not as project books but for the information they provide.

Carroll, Natalie, and Greg Hunt. *Understanding the Honey Bee* (4-H Beekeeping, Division I). Purdue Extension. **extension.purdue.edu/extmedia/4h/4-h-571-w.pdf**

Carroll, Natalie, and Greg Hunt. *Working with Honey Bees* (4-H Beekeeping, Division II). Purdue Extension. **extension.purdue.edu/extmedia/4h/4-h-586-w.pdf**

Hunt, Greg, and Natalie Carroll. *Advanced Beekeeping Methods* (4-H Beekeeping, Division III). Purdue Extension. **extension.purdue.edu/extmedia/4h/4-h-593-w.pdf**

As you learn more about bees and beekeeping, you may find it helpful to stay up-to-date by subscribing to one or both of the following periodicals:

American Bee Journal
dadant.com/journal
Phone: 217-847-3324

Bee Culture: The Magazine of American Beekeeping
beeculture.com
Phone: 800-289-7668

Other Book Resources

Blackiston, Howland. 2020. *Beekeeping for Dummies*, Fifth Edition. Hoboken: John Wiley & Sons Inc.

Root, A. I. 2020. *The ABC and XYZ of Bee Culture*, 42nd Edition. Medina, OH: A. I. Root Co.

Sammataro, Diana, and Alphonse Avitabile. 2021. *The Beekeeper's Handbook*, Fifth Edition. New York: Cornell University Press.

Tew, James E. 2000. *Beekeeping Principles*. Hamilton, IL: Great River Printing Company.

Tew, James E. 2004. *Backyard Beekeeping.* Auburn: Alabama Cooperative Extension System.

Other Helpful Websites

Iron County 4-H Beekeeping Page, Cedar City, Utah. **ironbeekeeper.org**

Maine State Beekeepers Association. **mainebeekeepers.org**

National Honey Board. **honey.com**

North Carolina State Beekeepers Association. **ncbeekeepers.org**

Ohioline, Ohio State University Extension. **ohioline.osu.edu**, search "beekeeping."

How to Find a Beekeeper

To find a beekeeper in your area willing to help you learn more about beekeeping, go to **beeculture.com** and click on Resources > Find help. Go to **ohiostatebeekeepers.org** and click on "Affiliates & Associations" to find a list of Ohio beekeeping associations in your region or county.

Need help? *Many local beekeeping associations offer scholarships to youth interested in beekeeping. Be sure to check with the beekeeping association in your area for more information.*

Project Guide

Introduction to the Project

Truly successful beekeepers learn about their bees and are familiar with their care, management, and condition. As you complete the activities in this Project Guide, remember that you can choose activities that are interesting to you. What is it about beekeeping that you really like? Keep your interests in mind as you plan your project. Choosing what you want means that you will learn and have fun.

Project Goals and Objectives

Developing your project goals and objectives at the beginning of your 4-H project helps you determine what you want to accomplish while taking this project. Ask yourself, "What do I want to learn? Why do I want to take this project?" A goal is a statement of what you want to learn or do. Set your goals to align with your reasons for taking on this project. Are you interested in learning more about beekeeping or would you like to earn money from your bees? Write your goals to reflect your focus. Learning to set goals is an important life skill. Goals can help you make a plan for using your resources—both personal and material.

Setting Your Goals

Need ideas for your goals? Your goals can be identified from the learning activities you list in the Member Project Guide or from additional interests you have. Decide on **at least three** goals and write them down on page 11 or on a separate piece of paper.

See the next page for tips on setting SMART goals.

Setting Your Objectives

Now you need to write individual steps, or objectives, to help you reach your goals. Each goal should have one or more objectives that states one action to take while working toward your goal. Objectives are best when written with action verbs and a few details. For example, objectives for the goal "learn how to divide my bees and start a new colony" might be:

Objective 1: Interview a beekeeper and ask about dividing a hive. Write the information in a few short paragraphs.

Objective 2: Ask for more information from at least one professional group of people with experience in dividing hives. (Use the internet for research.)

Objective 3: Make a list of the special equipment needed to divide a hive.

Objectives can be measured. In the example above, you would have interview notes, information from the professional group, and a list of equipment. Those items are good evidence of what you have learned.

Write a rough draft of your goals and objectives. Ask your project helper to review it with you. Discuss whether the goals and objectives are reasonable for your age and experience. Older learners should have goals and objectives that are more involved than younger learners'. You may wish to adjust your goals before writing the final draft in your project book.

Review your goals every once in a while to see if you are on track to completing them. It is likely your goals will be adjusted during your project experience. That's OK! It means you are learning about bees and beekeeping. At the end of the project, ask yourself, "Did I reach my goals?" and "What have I learned?"

Set SMART Goals. *Use the following SMART characteristics as a guide when setting your goals.*

S*pecific*

M*easurable*

A*ttainable*

R*esults-oriented*

T*ime-bounded*

Specific. *Writing a goal to "learn about beekeeping" is too broad. A more specific goal is "learn how to make comb honey." Being specific helps you stay focused.*

Measurable. *Being able to measure your goal helps you set a definite result beforehand. Let's say you want to double your honey production. Now that you have set a measurable amount as your goal, you can gauge your progress.*

Attainable. *This characteristic keeps your goal realistic and within reach. You may want to collect honey from eight hives some day, but trying to do this now would be overwhelming. Start with reasonable expectations such as, "I want to divide my hive so I have two colonies."*

Results-oriented. *Focus on where you want to end up by stating the results you would like to see. Something like "make beeswax candles" gives you a clear picture that makes your goal more real.*

Time-bounded. *A time-bounded goal has a time limit with a target date that helps you focus on what needs to be done and when. So, you could state ahead of time that you will divide your hive by July 1. This gives you time to make sure you have the proper tools and a helper with you on the day you divide your hive.*

Goal 1: _____

_____ Project helper's initials: _____

Objective 1: _____

Objective 2: _____

Objective 3: _____

What I learned: _____

_____

_____ Project helper's initials: _____

Goal 2: _____

_____ Project helper's initials: _____

Objective 1: _____

Objective 2: _____

Objective 3: _____

What I learned: _____

_____

_____ Project helper's initials: _____

Goal 3: _____

_____ Project helper's initials: _____

Objective 1: _____

Objective 2: _____

Objective 3: _____

What I learned: _____

_____

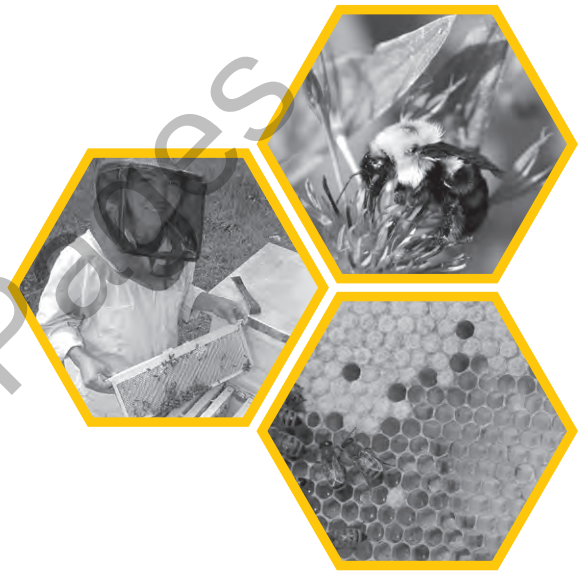
_____ Project helper's initials: _____

Topics of Interest

Select and study **one or more topics** from one of the references listed in the Where to Find Information about Bees section of this book or from another similar beekeeping reference book. What topic is especially interesting to you? Select one and write a short statement that describes it. Depending on your age and skill level, your topic can be simple or complex. Use the following page to write a summary that explains in more detail what you learned about it.

You can complete as many topics of interest as you want, but you must do at least one new one each year. Remember to record the dates you begin and complete each topic of interest. To keep learning more about bees, choose different topics each year you complete a beekeeping project. Here are some ideas:

- History of beekeeping
- Value of bees
- Bee development
- Getting the bees
- Bee colony residents
- Beekeeping tools
- Bee communication
- Pollen and nectar
- Honey and honey plants
- Beeswax and honeycomb
- Handling and inspecting bees
- Bee diseases and pests



Topics of Interest **Complete at least one. If necessary, attach additional pages.**	**Date Started**	**Date Completed**
Example: The honey bee hive has three distinct residents making up the colony of each hive—the queen, the worker, and the drone.	*3/14/YR*	*3/31/YR*