

# **Beekeeping Basics - Documentation**



Benjamin Asbeck

Fall 2010

## Table of Contents

Introduction .....	3
Training Goals .....	3
Obtaining Bees & Equipment .....	3
Meet the Castes .....	4
Physical Descriptions .....	5
Journal .....	6
Check Yourself .....	7
Roles in the Hive .....	8
Journal .....	9
Check Yourself .....	10
All of the Pieces .....	11
Hive Components .....	12
Exercise .....	13
Check Yourself .....	14
Hive Component Functions .....	15
Exercise .....	17
Check Yourself .....	18
Equipment and Tools .....	19
Journal .....	20
Check Yourself .....	21
Putting it All Together .....	22
Assembly Order .....	23
Practice .....	24
Check Yourself .....	25
Location, Location, Location .....	26
Selecting a Good Hive Location .....	27
Practice .....	28
Introducing the Bees .....	29
Packages and Nucs .....	30
Introducing Packaged Bees .....	31
Journal .....	32
Check Yourself .....	33
Check Your Knowledge .....	34
Assessment .....	35
Assessment Feedback .....	41
Survey .....	42

## **Introduction**

Beekeeping can be a fun, environmentally beneficial, and profitable hobby. It takes up very little space and can potentially be done as a backyard hobby. Bees help pollinate flowers, produce wax which can be used to make candles, and produce honey which is a healthy treat.

There are a number of important things that you will need to know to get started with your new hobby. Bees are considered livestock and can be potentially dangerous if not handled properly. By taking up the hobby of beekeeping, you are making a commitment to ensure that your bees are fed and kept in a location that promotes the safety of the hive as well as safety for humans.

### ***Training Goals***

At the end of this training, you will:

- Know the names and functions of beekeeping equipment, tools, and components
- Know how to identify the three castes of honeybees
- Understand the role of each bee caste in the hive
- Understand the sequence of events for hive assembly
- Understand how to select a good location for a hive
- Understand how to introduce a package of bees to a hive

### ***Obtaining Bees & Equipment***

After you complete this training, you will almost be ready to begin your new hobby. However, you will first need to acquire bees and the hive components that will be discussed in the training. Bees and equipment can all be purchased locally or online from an established beekeeping supplier.

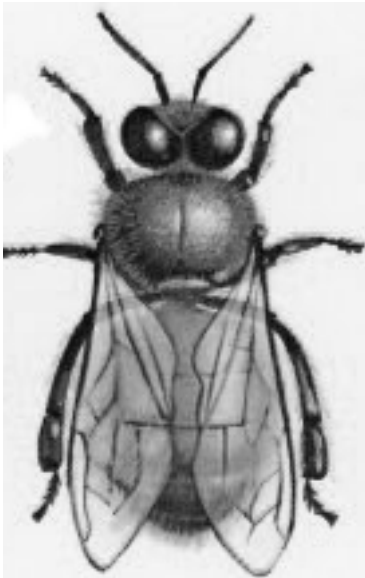
For more information, visit: <http://www.beesource.com>

## Meet the Castes

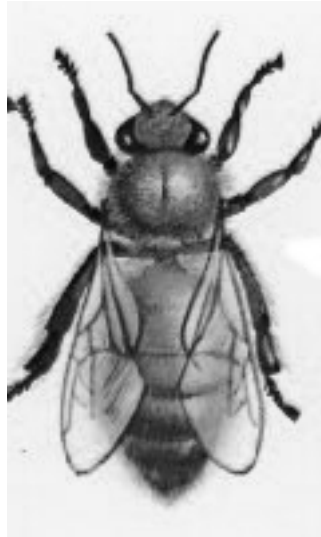
## *Physical Descriptions*

There are three castes, or types, of bees that make up the hive:

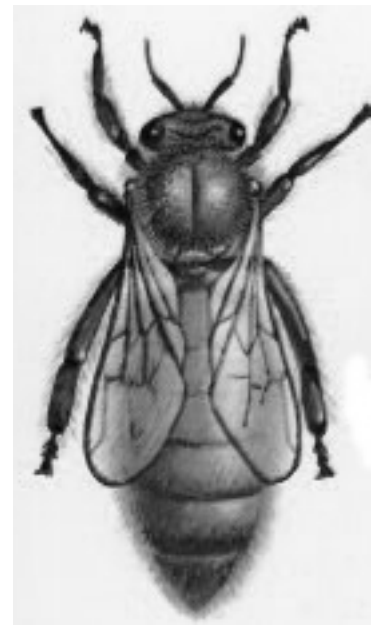
*Drone (male)*



*Worker (female)*



*Queen (female)*



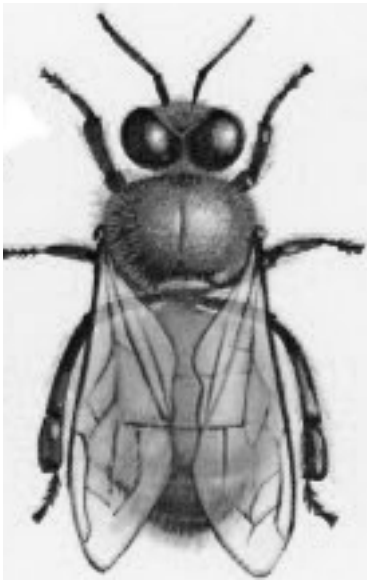
All three castes of the honeybee are yellowish with black rings around their abdomen. They all look very similar, don't they? However, you should be able to see from the images above that the appearance of each bee caste does vary slightly. When working in your hive, it will be important for you to know how to differentiate between your drones, workers, and queen bees.

**Note:** The queen bee has a bald spot on her thorax. Bee keepers will often put a dab of paint on her back to allow her to be identified more easily.

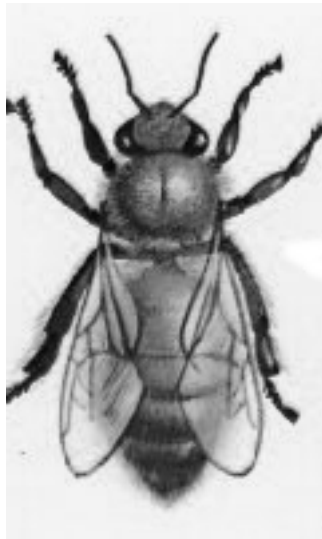
## Journal

Take a few minutes to study the three bee images. As you examine them, use the blank space below to write notes about your observations. Highlight similarities and differences that you see for each bee type.

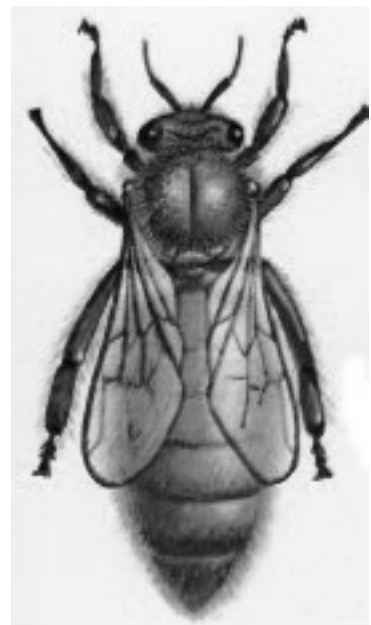
Drone (*male*)



Worker (*female*)



Queen (*female*)



**Notes:**

## Check Yourself

Check your observations and see if they match up with my descriptions.

### **Drone**

The drone appears to be fatter and medium in length compared with the other bee castes. He also appears to have much larger eyes than the worker and queen bees.

### **Worker**

The worker appears to be small and thin when compared with the drone and queen bees.

### **Queen**

She has the longest body, but she is thinner than the drone. Her eyes are small and spaced far apart and she has a bald spot on her thorax.

## *Roles in the Hive*

Each caste of bee has specific functions in the hive colony.

### **Drone**



The drone is the male bee in the hive. His primary function in the hive is to mate with the queen. Sometimes the drone can mate with the queen in another hive, but he primarily stays in his own hive. His secondary function is to help keep the hive cool by flapping his wings. He can not sting and he does not produce honey. The drone serves no role in the survival of the hive. Since they would do little more than drain the hive's resources, the drones are ejected or killed prior to the start of winter.

### **Worker**



The worker is female and makes up the largest population of the hive. The workers are where the phrase “busy as a bee” originates as they essentially run the hive. Each worker lives roughly 40 days. Their first 20 days are spent inside the hive feeding the young and producing honey. The last 20 days are spent outside the hive foraging for nectar and pollen. The workers can sting and protect the hive from danger. They also help control the temperature in the hive by fanning their wings when it's hot or clustering together in a ball when it is cold.

### **Queen**



The queen is also female and exists simply to lay eggs. She only mates once and can lay 2500 eggs per day for up to 5 years during the summer. She begins laying eggs in late March and continues until the fall. There is only one queen in a hive unless the hive is about to produce a new queen.

## Journal

Use the space below to list as many descriptive attributes as you can for each bee caste.

Drone



Worker



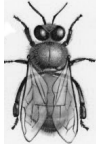
Queen



## Check Yourself

Check your descriptions. Did you include something similar to the following?

Drone



Male

Mate with the queen

Help cool hive by flapping wings

Does not sting

Is ejected from the hive at the start of winter

Worker



Female

Lives up to 40 days

Feeds young and produces honey

Forages for nectar and pollen

Protects hive from danger

Queen



Female

Lives up to 5 years

Mates once

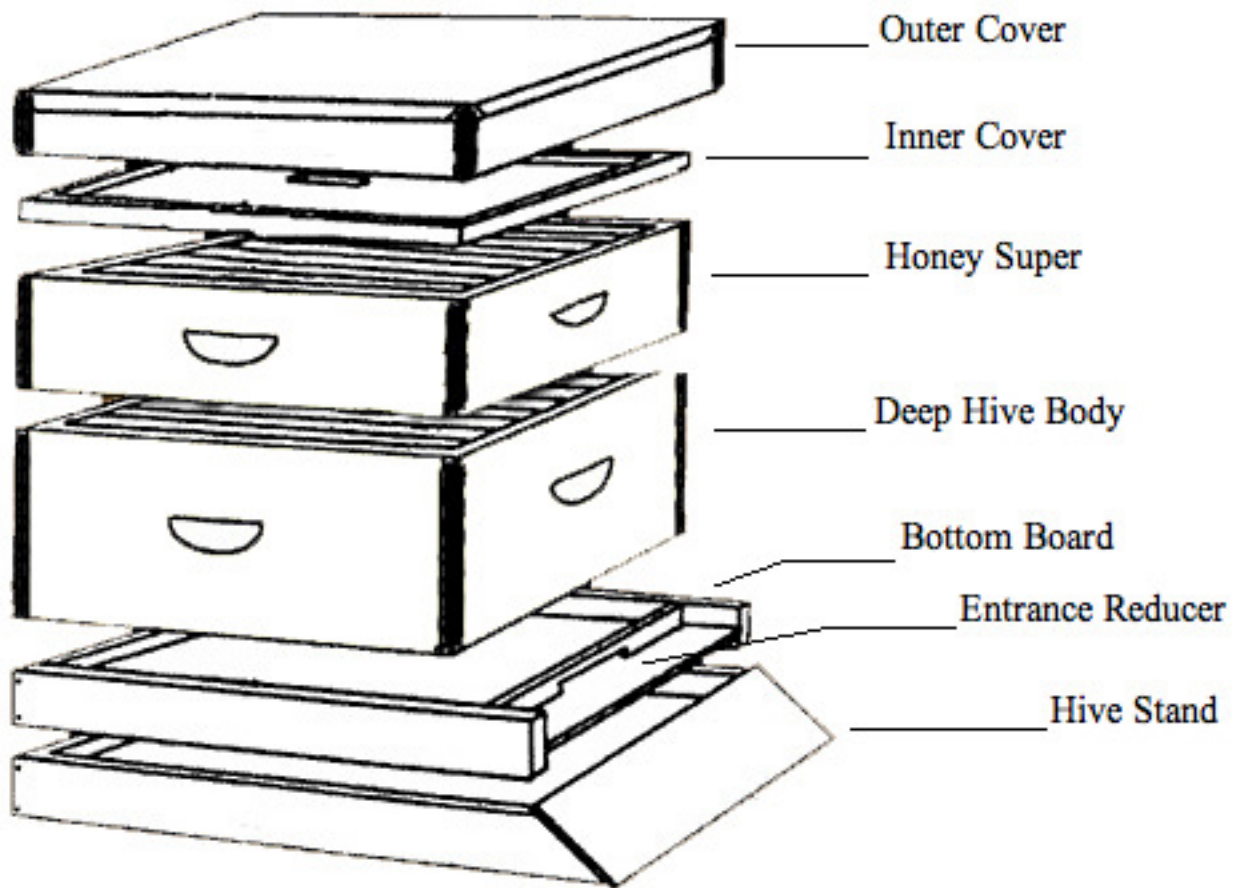
Can lay 2500 eggs per day during summer

Usually only one in a hive

## All of the Pieces

## *Hive Components*

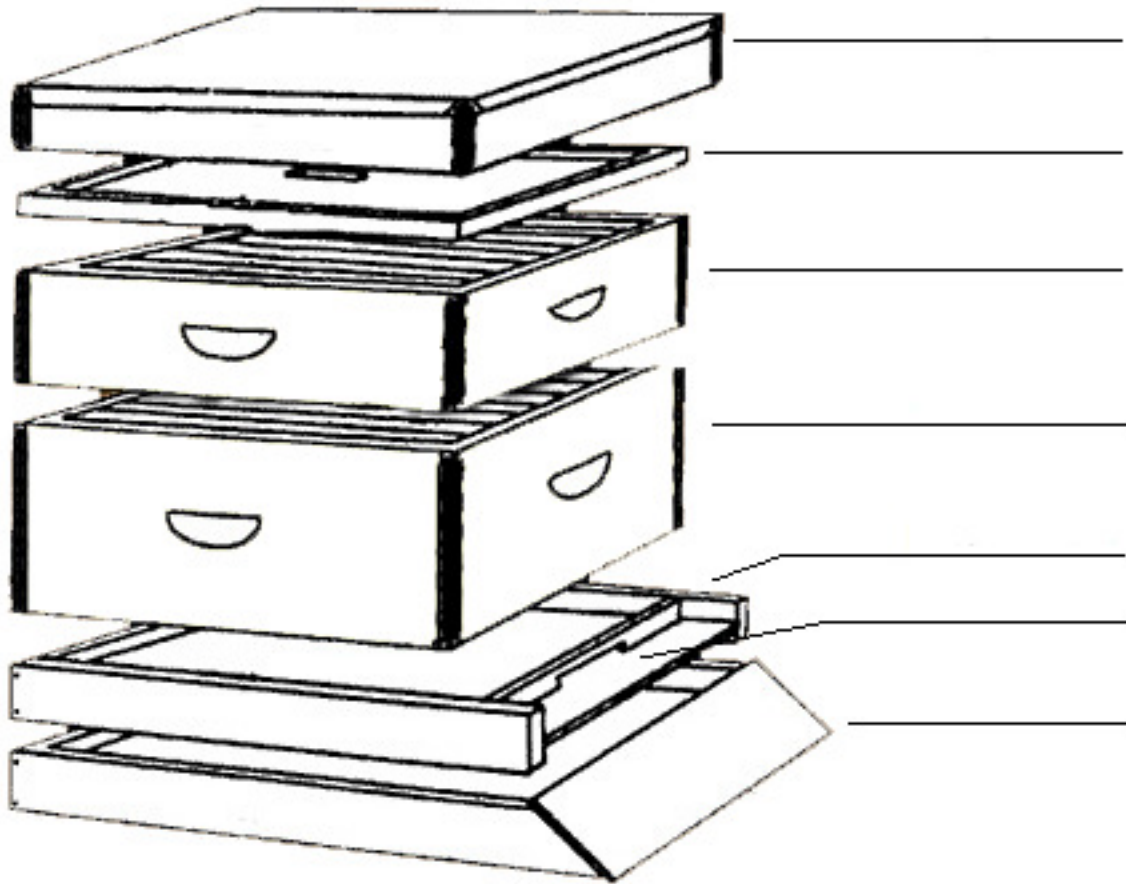
The hive is where the bees live, raise young, and store nectar, pollen, and honey. The hive is made up of a number of parts:



Study the diagram above and rehearse the part names with its associated section. It might help to create a device to help you remember, such as “The hive stands on the hive stand.”

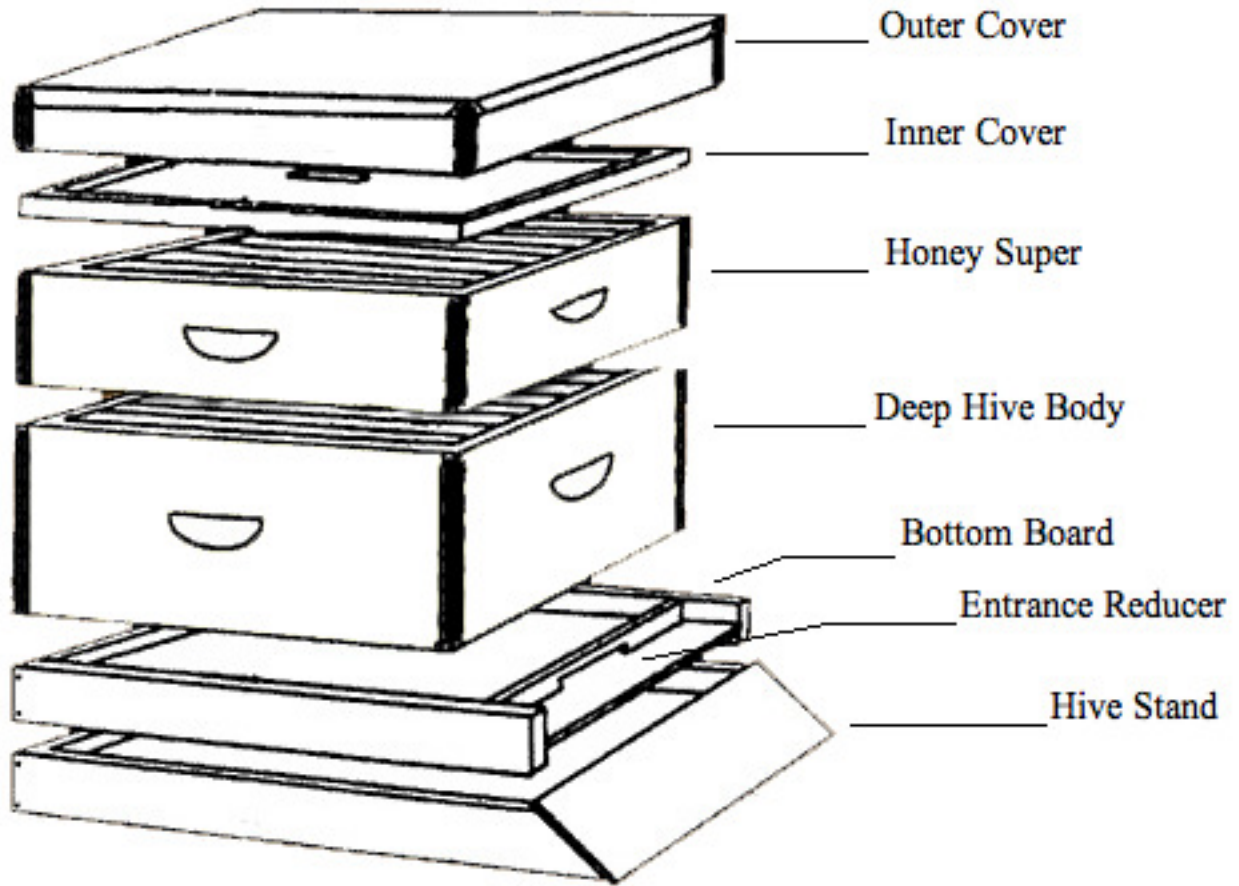
### Exercise

Fill in the chart below to test your knowledge.



### Check Yourself

Check your answers to see if they match the chart below.



## ***Hive Component Functions***

Now let's take a look at the purpose for each section of the hive. We'll start at the bottom and work up to the top.

### **Hive Stand**

The hive sits at the base of the beehive. It elevates the hive off of the ground and prevents water from entering the hive.

### **Bottom Board**

The bottom board can be a solid board or it can be screened. A screened board allows air to enter the hive and keep it cooler in the summer. It also helps control against mites. When bees shake off mites, they will fall through the screen and out of the hive. A solid board provides less ventilation, so it is good to use in the winter as it helps hold the warm air in the hive.

### **Entrance Reducer**

The entrance reducer provides a smaller opening in the front of the hive. This controls the traffic that enters and exits the hives. The smaller opening helps protect the hive from threats such as robber bees, mice, and skunks.

### **Deep Hive Body**

The deep hive body is sometimes also referred to as the brood box. The hive body holds frames that the bees will use for storage. This is where bees will raise their young and store honey and pollen for their own survival.

### **Honey Super**

The honey super holds frames that the bees use to store their surplus honey. This is the honey that the bee keeper will harvest for personal use.

*Continued on next page*

## *Hive Component Functions - continued*

### **Inner Cover**

The inner cover is a thin board that covers the top of the hive body. It provides an insulating dead air space between the top of the hive and the outer cover. The inner is not required, but is recommended as it also helps to prevent the outer cover from getting stuck.

### **Outer Cover**

The outer cover is the roof of the hive and sits on top of the inner cover. When using an inner cover, you should use a telescoping outer cover.



## Exercise

See if you write one sentence for each item to describe its function.

**Hive Stand**

**Bottom Board**

**Entrance Reducer**

**Deep Hive Body**

**Honey Super**

**Inner Cover**

**Outer Cover**

## Check Yourself

Now compare your notes with the following points to check your knowledge.

### **Hive Stand**

...is the base of the hive and elevates the hive off of the ground to prevent water from entering.

### **Bottom Board**

...sits on the bottom of the hive. Can be solid or screened and helps control ventilation in the hive.

### **Entrance Reducer**

...creates a small opening in the hive to help protect the hive from threats such as robber bees, mice, and skunks.

### **Deep Hive Body**

...is the chamber where the young are raised and where the bees store pollen and honey for their own survival.

### **Honey Super**

...is the chamber where surplus honey is stored and eventually harvested by the bee keeper.

### **Inner Cover**

...provides an insulating dead air space between the top of the hive and the outer cover.

### **Outer Cover**

...is the roof of the hive and sits on top of the inner cover.

## ***Equipment and Tools***

There are a number of tool and equipment items that are used by the beekeeper. The items most commonly used are:

### **Light colored clothing**

The bee keeper should wear light colored clothing rather than dark clothing. Bees may act aggressively to dark colors.

### **Jacket**

A heavy jacket should be worn to cover and protects the bee keeper's arms and body.

### **Veil**

The veil is a screened hood that completely covers and protects the bee keepers head. It is possible to get veil / jacket combos where they are attached, or you can have a separate veil to wear with any heavy jacket.

### **Bee Keeper's Gloves**

Gloves that are worn by bee keepers are made of very soft leather so the bee keeper is able to feel. The gloves protect the keeper's hands from stings. However, experienced bee keepers will often not use gloves at all.

### **Hive Tool**

The hive tool is a small metal bar that is used to pry open the hive sections.

### **Hammer, Nails, and Wood Glue**

The hammer, nails, and wood glue are used to assemble the hive boxes and frames.

### **Smoker and Fuel**

The smoker is used to blow smoke into the hive before opening it. The smoke soothes the bees and helps to protect the beekeeper. Fuel used in the smoker can be pine needles, scraps of wood, or wood pellets.

## Journal

See if you write one sentence for each item to describe its usage.

**Light colored clothing**

**Jacket**

**Veil**

**Bee Keeper's Gloves**

**Hive Tool**

**Hammer, Nails, and Wood Glue**

**Smoker and Fuel**

## Check Yourself

Now compare your notes with the following points to check your knowledge.

### **Light colored clothing**

Light colored clothing should be worn because bees may act aggressively toward dark colors.

### **Jacket**

A heavy jacket should be worn to cover and protects the bee keeper's arms and body.

### **Veil**

The veil is a screened hood that completely covers and protects the bee keepers head.

### **Bee Keeper's Gloves**

The gloves protect the bee keeper's hands from stings.

### **Hive Tool**

The hive tool is a small metal bar that is used to pry open the hive sections.

### **Hammer, Nails, and Wood Glue**

The hammer, nails, and wood glue are used to assemble the hive boxes and frames.

### **Smoker and Fuel**

The smoker is used to blow smoke into the hive before opening it. The smoke soothes the bees and helps to protect the beekeeper.

## Putting it All Together

## *Assembly Order*

Now it's time to put the hive together. The hive is put together in the following order:

1. First nail and glue the boards of the hive body together so they form boxes.
2. Next, nail together the rectangular frames.
3. Slide the foundation into each frame and use wire to hold it in place.
4. Slide each frame into each hive body.
5. Place the hive stand in the location where it will reside when bees are introduced.
6. Set the bottom board on the hive stand.
7. Place one hive body on the hive stand and put the second in storage for later use.
8. Place the inner cover on top of the hive body.
9. Place the outer cover on top of the inner cover.

The hive is now ready to have bees introduced. The second hive body that we set aside would normally be used. Also note that we are not using the honey super. This will be added after the bees have been introduced and the hive is well established.

## Practice

Your instructor will provide you with a sample kit to allow you to practice assembling the hive. Use this space to journal your observations as you go through the process.

### Check Yourself

Now that you have had some time to practice, compare your notes with the following to verify that you have the following steps documented.

1. Nail and glue the boards of the hive body together so they form boxes.
2. Nail together the rectangular frames.
3. Slide the foundation into each frame and use wire to hold it in place.
4. Slide each frame into each hive body.
5. Place the hive stand in the location where it will reside when bees are introduced.
6. Set the bottom board on the hive stand.
7. Place one hive body on the hive stand and put the second in storage for later use.
8. Place the inner cover on top of the hive body.
9. Place the outer cover on top of the inner cover.

**Location, Location, Location**

## *Selecting a Good Hive Location*

Knowing where to place your hive is very important. The location of the hive can affect the health of the bees as well as safety to humans. When selecting the hive location, you must consider drainage, sunlight, wind, human traffic, and the distance to sources of nectar, pollen, and water.

Here are some key points for you to remember:

**Shade** – Try to place the hive in a location that receives morning sun and afternoon shade. The morning sun will warm up the hive and get the bees moving. Afternoon shade will help the hive cool in the hotter portion of the day.

**Wind** – The hive should be placed where it has a wind break on the north side. Strong cold winds blow from the north in the winter. A wind break will allow the hive to stay warmer during the winter months.

**Drainage** – The hive stand will raise the hive off of the ground to help, but you should place the hive in an elevated location that receives good drainage. Do not place your hive in standing water.

**Human Traffic** – Place the hive away from people. Bees will fly in a direct line out of the hive. You should not place the hive directly facing a house or path where people walk as the bees may bother the humans and vice versa. You can place a shrub or fence in the path of where bees leave the hive. This will cause the bees to fly up and over the heads of people.

**Nectar, Pollen, and Water** – Ideally, the hive should be located within a half mile of sources of nectar, pollen, and water. This is typically not a problem as flowers and sources of water are often readily available and bees can fly up to a distance of two miles when gathering food.

## Practice

Based on the criteria above, sketch and label a diagram that demonstrates a good location for placing a hive. Include and label representations for shade, drainage, wind, human traffic, plants (nectar & pollen), and water.

- Shade – Morning sunlight and afternoon shade
- Wind – A wind break on the north side
- Drainage – Elevated off the ground and out of standing water
- Human traffic – Away from human traffic.
- Nectar, Pollen, and Water – Within a half mile of sources of food and water

## Introducing the Bees

## ***Packages and Nucs***

Now that the hive has been built, it's time to introduce the bees. There are two ways that you can purchase bees: **Nuc** (*pronounced: nuke*) or **Package**

**Nuc** is short for nucleus colony and is the simplest way to introduce bees to the hive. A nuc is essentially a pre-existing colony, including the queen. The downside of a nuc is that it is more expensive than a package and it may not always be available. To introduce a nuc to the hive, you simply would place it on the bottom board with the entrance reducer, cover it with the inner and outer cover, and then feed the bees a 1:1 water / sugar mixture.

A **package** is essentially the same as a nuc except it does not include frames of honeycomb containing honey, pollen, and brood. Also, the queen comes in a separate container and must be introduced to the hive colony.

Since packages are much more complex when compared with the nuc, the remainder of this instruction will focus on the steps for introducing a package of bees to the hive.

### ***Introducing Packaged Bees***

First, prepare a 1:1 mixture of sugar and water. Spray it on the bees and brush it on the screen of the package. The bees will drink the sugar water for nourishment.

Now place the plug in the entrance reducer. This will prevent the bees from leaving the hive once you have poured them into the brood box.

Remove the queen's cage from the package. You will see that the cage has a small hole plugged with sugar. She and the other bees will eat the sugar to allow her to escape the cage within the next few days. You should scrape off a little bit of the sugar candy to rough it up a bit.

Suspend the queen cage between two frames in the hive body. She will spend the next few days in her cage while the other bees grow accustomed to her scent. If she were placed directly in the hive, the other bees would likely kill her.

Remove the lid from the bee package and quickly turn it upside down over the deep hive body. Gently shake the package so the bees fall into the hive.

Now place the inner cover over the hive body and then place the outer cover over the inner cover. Place the package near the hive body entrance so any remaining bees will be able to rejoin the hive when the plug is removed from the entrance reducer.

Wait approximately two hours or until dark, whichever comes first, and then remove the plug from the entrance reducer.

Feed the bees a 1:1 mixture of sugar water and wait. After about two or three days, open the hive to see if the queen has left her cage. If she has not escaped, use a knife to scrape away the remaining sugar from the hole so she can join her new colony.

## Journal

Use the space below to create an ordered checklist that you can use when introducing packaged bees to a hive.

## Check Yourself

Check your notes to confirm that you have every step in the correct order

1. Mix a 1:1 water / sugar mixture
2. Spray the bees and brush the liquid on the bee package's screen
3. Plug the entrance reducer
4. Remove the queen's cage from the package
5. Scrape off some of the sugar candy from the queen's cage
6. Suspend the queen's cage between two frames in the hive
7. Remove the lid from the bee package
8. Quickly turn the bee package upside down
9. Gently shake the package so the bees fall into the hive body
10. Place the inner cover over the hive body
11. Place the outer cover over the inner cover
12. Place the package near the hive entrance
13. Remove the plug from the entrance reducer
14. Check the hive in 2-3 days to verify that the queen has escaped

## Check Your Knowledge

## *Assessment*

### **1. Write the name of each bee caste next to its description.**

\_\_\_\_\_ - Female bee. She is the smallest of the three bee castes.

\_\_\_\_\_ - Male bee. He has a fat and medium length body.

\_\_\_\_\_ - Female bee. She has a long, thin body.

### **2. Write the first letter of each bee caste next to its related function.**

(Q – Queen, W – Worker, D – Drone)

\_\_\_ Forage for food

\_\_\_ Lay eggs

\_\_\_ Does not sting

\_\_\_ Is ejected from the hive at the start of winter

\_\_\_ Produces honey

\_\_\_ Mate with female bees

\_\_\_ Can live for up to 5 years

\_\_\_ Protect the hive

\_\_\_ Male

\_\_\_ Usually the only one in a hive

*Assessment Continued*

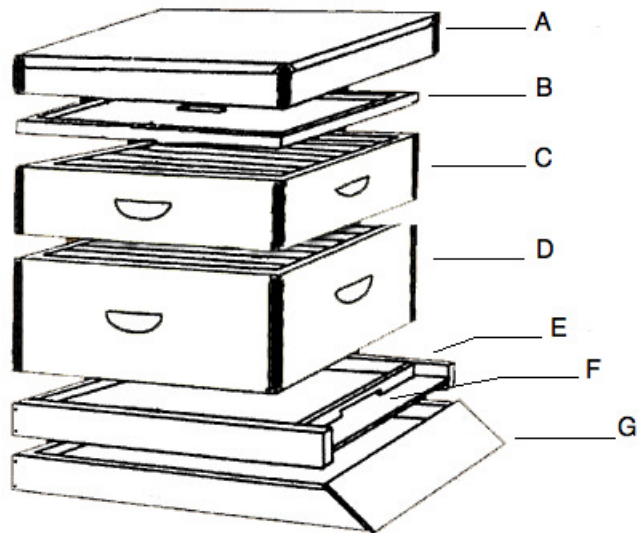
**3. Write the correct name for each part represented by the letters.**

*Answer Choices:*

Bottom Board  
Entrance Reducer  
Honey Super  
Inner Cover  
Queen Cage  
Queen Cage

Deep Hive Body  
Hive Stand  
Honey Trap  
Outer Cover

- A. \_\_\_\_\_
- B. \_\_\_\_\_
- C. \_\_\_\_\_
- D. \_\_\_\_\_
- E. \_\_\_\_\_
- F. \_\_\_\_\_
- G. \_\_\_\_\_



*Assessment Continued*

**4. Write the letter of each function next to the related item:**

- |                      |   |
|----------------------|---|
| ___ Hive Stand       | A. Helps control hive ventilation                       |
| ___ Bottom Board     | B. The roof of the hive                                 |
| ___ Entrance Reducer | C. Where the young are raised                           |
| ___ Deep Hive Body   | D. Restricts the movement of the queen                  |
| ___ Honey Super      | E. Dampens the sound that may enter the hive            |
| ___ Inner Cover      | F. Elevates the hive off of the ground                  |
| ___ Outer Cover      | G. Prevents honey from leaking out of the the hive      |
|                      | H. Honey from this is harvested by the keeper           |
|                      | I. Provides an insulating dead air space                |
|                      | J. Protects the hive from robber bees, mice, and skunks |

**5. Circle the tools that are used in beekeeping**

- |                        |                  |
|------------------------|------------------|
| Black t-shirt          | Smoker and Fuel  |
| Shorts                 | Wrench           |
| Veil                   | Paint            |
| Jacket                 | Wood Glue        |
| Light Colored Clothing | Hive Tool        |
| Bee Keeper's Gloves    | Hammer and nails |

*Assessment Continued*

**6. Write a number next to each item to identify the correct order.**

- \_\_\_ Set the bottom board on the hive stand.
- \_\_\_ Nail and glue the boards of the hive body together so they form boxes.
- \_\_\_ Place the outer cover on top of the inner cover.
- \_\_\_ Place the hive stand in the location where it will reside when bees are introduced.
- \_\_\_ Slide the foundation into each frame and use wire to hold it in place.
- \_\_\_ Place the inner cover on top of the hive body.
- \_\_\_ Nail together the rectangular frames.
- \_\_\_ Place one hive body on the hive stand and put the second in storage for later use.
- \_\_\_ Slide each frame into each hive body.

*Assessment Continued*

**7. Write a T for true or F for false next to each of the following hive location descriptions.**

A hive should be placed in an area that receives direct sunlight in the afternoon.

A hive should be placed within a half mile of water

A hive should be placed near nectar and pollen producing plants

A hive should be placed so it is exposed to wind on the north side.

A hive should be placed away from human traffic

A hive should never be placed where it faces a fence or shrub.

*Assessment Continued*

**8. Write a number next to each item to identify the correct order.**

- \_\_\_ Place the outer cover over the inner cover
- \_\_\_ Quickly turn the bee package upside down
- \_\_\_ Scrape off off some of the sugar candy from the queen's cage
- \_\_\_ Spray the bees and brush the liquid on the bee package's screen
- \_\_\_ Remove the plug from the entrance reducer
- \_\_\_ Remove the queen's cage out of the package
- \_\_\_ Remove the lid from the bee package
- \_\_\_ Place the inner cover over the hive body
- \_\_\_ Mix a 1:1 water / sugar mixture
- \_\_\_ Suspend the queens's cage between two frames in the hive
- \_\_\_ Check to verify that the queen has left the cage
- \_\_\_ Gently shake the package so the bees fall into the hive body
- \_\_\_ Plug the entrance reducer
- \_\_\_ Place the package near the hive entrance

## ***Assessment Feedback***

1. Worker, Drone, Queen
2. W, Q, D, D, W, D, Q, W, D, Q
3. A – Outer Cover, B – Inner Cover, C – Honey Super, D – Deep Hive Body, E – Bottom Board, F – Entrance Reducer, G – Hive Stand
4. F, A, J, C, H, I, B
5. Smoker and Fuel, Veil, Jacket, Wood Glue, Light colored clothing, Hive Tool, Bee Keeper's gloves
6. 6, 1, 9, 5, 3, 8, 2, 7, 4
7. F, T, T, F, T, F
8. 11, 8, 5, 2, 13, 4, 7, 10, 1, 6, 14, 9, 3, 12

## *Survey*

Please complete the following survey to help us assess this training.

1. Now that you have completed this instruction, do you feel confident that you are equipped with the knowledge necessary to set up a beehive?
2. Do you feel that all of the sections were explained clearly? If not, which sections did you find confusing?
3. Were the exercises, journals, and review sections beneficial in helping you learn the material?
4. Do you feel that the length of instruction was appropriate for the topic being covered?
5. Were there any areas of the instruction that you feel could have been written more effectively?