



# CORNERSTONE JUNIOR SCHOOL - MUKONO

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## P.5 SCIENCE SET ONE SELF STUDY LESSONS

### BEE KEEPING

24.5.2020

#### INSTRUCTIONS

- You are expected to complete one lesson daily
- Use the following references for further reading: MK Integrated Science Book 5, Baroque Integrated Science Book 5 and Comprehensive Science Book 5.

#### LESSON 1

**By the end of this lesson, the learner should be able to:**

1. Define social insects
2. Explain why bees are called social insects
3. Give examples of solitary insects.
4. Identify the types of bees in a hive.

Bees are social insects which live in colonies.

These insects can be domesticated and kept by people because of their different benefits.

This is called *bee keeping/apiculture*

#### **Social insects**

Social insects are insects that live and work together with others.

#### **Characteristics of social insects**

- They live together with others
- They work together with others

#### **Examples of social insects**

- Termites
- Black ants
- Wasps
- Honey bees

#### **Solitary insects**

These are insects which move, live and work alone.

### **Characteristics of solitary insects**

- They live alone
- They work alone
- They move alone

### **Examples of solitary insects**

- Grasshoppers
- Locusts
- Crickets
- House flies
- Mosquitoes
- Bumble bees
- Carpenter bees

### **Common terms in bee keeping:**

- i) **Apiculture**  
The act of rearing honey bees
- ii) **Honey bees**  
These are social insects that live in a hive
- iii) **A colony**  
A group of honey bees staying together
- iv) **A swarm**  
A group of honey bees flying together
- v) **An apiary**  
A place where bees are kept.
- vi) **A hive**  
A place where bees live

### **Types of honey bees**

There are three types of honey bees in a hive. These include:

- i) Queen bee
- ii) Drone bee
- iii) Worker bee

### **The Queen bee**

The queen bee is the female fertile bee in the hive.

It is larger than others in terms of structure and size.

Its main role is to lay eggs from which young ones develop.

The queen bee is fed on special food called **royal jelly**.

Queen bees are developed by feeding the young ones (grub) on royal jelly.

### **The drone bee**

This is the male bee in the hive.

It is the second largest in the hive.

Its main role is to mate with the queen bee.

Through mating it fertilizes the eggs of the queen bee.

Drones hatch from unfertilized eggs.

Drone bees don't live long because most of them die after mating.

This is because they lose their sexual organs during mating.

### **Nuptial flight**

This is a flight during when a queen bee mates with drone bees.

A queen bee mates with many drones at once during this flight.

After mating the eggs of the queen are fertilized from inside its body.

The queen starts laying few of the fertilized eggs after mating.

**Note:** Queen bees mate once in their life time.

### **Life cycle of honey bees**

Honey bees undergo complete metamorphosis i.e. Eggs, larva, pupa, adult.

## **LESSON 2**

By the end of the lesson, you should be able to:

1. Describe a worker bee.
2. State the roles of a worker bee in a hive.
3. Identify the bee products and their uses to people.

### **The worker bee**

It is the female sterile bee in the hive

It is the smallest bee in the hive.

It is regarded as sterile because it does not lay eggs.

The main role of a worker bee is to collect nectar from which honey is made.

### **Functions / roles of a worker bee**

- To feed the queen bee and the grub (brood) on royal jelly.
- To protect the bee hive from danger.
- To repair the bee hive.
- To build the comb cells for the queen bee to lay eggs.
- To control the temperature around the hive by flapping their wings in case it's too hot.
- To collect nectar, water and pollen.

### **Note:**

- Nectar is the sugary substance produced by the nectary glands (nectaries) at the base of the petals of a flower.
- Pollen is the food for worker bees. It is collected in the pollen basket on their hind legs.
- Propolis is a sticky substance collected from trees.
- Honey bees make honey combs using wax.

### **Bee products**

These are things that we get from bees.

They include:

- Bees wax
- Honey
- Propolis
- Pollen

### **Bees wax**

Bees wax is a yellowish brownish substance secreted by bees to build combs.

It is got together with honey during harvesting.

### **From bees wax, the following can be got**

1. Shoe polish.
2. Wood polish.
3. Candle wax.
4. Cosmetics.
5. Crayons.

### **Propolis**

This is a sticky greenish brown substance collected from trees by bees.

### **Uses of propolis to bees**

1. To smooth the inside part of the hive.
2. To seal the cracks in the hi

### **Importance of propolis to people**

- It can be used to heal wounds.
- It is used to treat some infections.

### **Products from propolis**

- Vanish
- Glue

### **Honey**

This is a sweet thick brownish substance produced by bees from nectar.

### **Uses of honey to people**

1. Honey is eaten as food.
2. Honey is used to sweeten tea.
3. Honey is used to sweeten bread.
4. Honey is used as medicine.

### **Importance of bees**

- a) Bees pollinate crops.
- b) They provide honey.
- c) They provide wax.
- d) They provide pollen.

### **Exercise**

1. State two ways insects are useful to people.
2. State two ways insects are harmful to people.
3. Name the special food for a queen bee.
4. Give the difference between propolis and proboscis
5. What food value do we get from eating pollen

### **LESSON 3**

**By the end of this lesson, you should be able to:**

1. Identify the types of bee hives.
2. Give examples of each type of hive.
3. State advantages and disadvantages of each type of bee hive.

### **BEE HIVES**

A bee hive is a place where bees live.

Naturally bees can make their own hives in holes of trees or even in ant hills.

However in bee farming, bee farmers can construct hives for the bees in a more organized way.

#### **Types of bee hives**

- i) Local or traditional bee hives
- ii) Modern bee hives
- iii) Natural bee hives

#### **Modern bee hives**

These are hives properly made with chambers, top bars and peers. They are used by the modern bee farmers.

They are made with the brood and honey chambers.

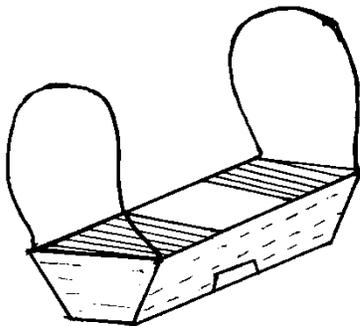
The brood chamber is where the queen bee lays its eggs while the honey chamber is where the worker bees store the honey.

In between the brood and honey chambers is a queen excluder which prevents the queen from crossing into the honey chamber.

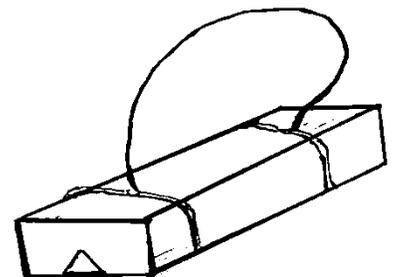
#### **Examples of modern bee hives**

- i) Box hive
- ii) Top bar hive

#### **Top bar hive**



#### **Box bee hive**

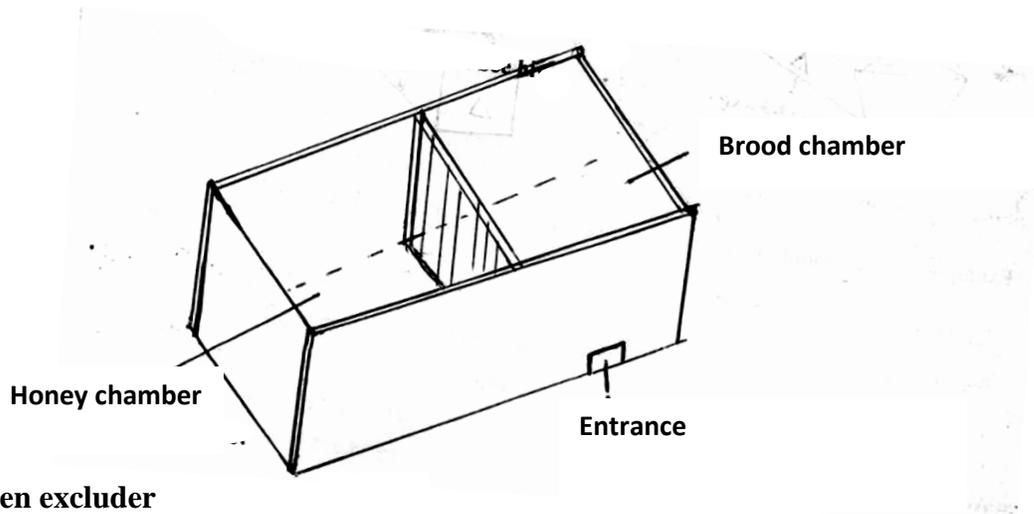


#### **Advantages of modern hives**

- i) They last longer than traditional hives.

- ii) Cleaner honey is harvested from them.
- iii) It is easy to inspect honey and wax from them.
- iv) Brood nests are not damaged when removing combs.

## **INTERNAL PARTS OF A MODERN BEE HIVE**



### **Queen excluder**

Is a barrier in the bee hive with holes big enough for worker bees to pass but too small for the queen and drone bees.

The queen excluder is useful in the following ways:

- i) Prevents queen from eating honey.
- ii) Prevents queen from laying eggs in honey.

### **Traditional bee hive**

These are hives made from local materials e.g. logs and reeds. They don't have chambers.

#### **Examples of traditional bee hives**

- i) The Kigezi hive.
- ii) The dug out log hire.

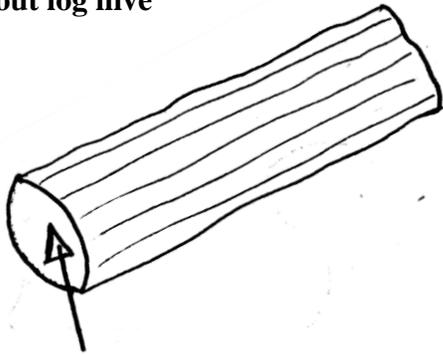
#### **Advantages of traditional hives**

- i) They are cheap and easy to make.
- ii) The colony is not disturbed by the bee keeper.

#### **Disadvantages of traditional hives**

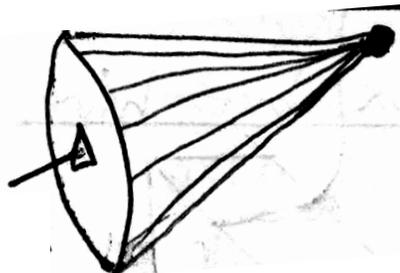
- i) The colony can't be inspected.
- ii) The hive is damaged when harvesting honey.

## Dug out log hive



Entrance

## Kigezi bee hive



Entrance

## Swarming

This is the massive movement of honey bees from one place to another looking for a new hive.

This happens when the bees are no longer comfortable with where they are due to particular reasons.

### Reasons for bee swarming

There are several reasons as to why bees move from one hive to another.

These include:

- |                                  |                                    |
|----------------------------------|------------------------------------|
| i) Too much noise near the hive. | v) When a new queen bee is born.   |
| ii) Death of the queen bee.      | vi) Direct sunshine into the hive. |
| iii) Bad smell near the hive.    | vii) Direct smoke into the hive    |
| iv) Leaking of the new hive.     | viii) When attached by enemies     |

### Control of swarming

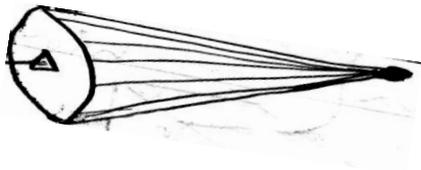
In order to control swarming, the farmer needs to know the reasons as to why bees swarm. This helps you to put in place conditions that prevent swarming.

#### *Below are some ways of controlling swarming*

- Putting hives near water source.
- Setting a hive near flowers.
- Setting hives in quite place.

## Exercise

1. Give the difference between an Apiary and Apiculture
2. How can farmers prevent their bees from swarming?
3. State two advantages of modern bee hives.
4. Give the advantages of local bee hives over modern ones.
5. How is a queen excluder useful in a modern bee hive?
6. What type of bee hive is shown below?



## LESSON 4

**By the end of this lesson, you should be able to:**

1. Define siting and stocking a hive.
2. Identify factors considered when siting a hive.
3. State ways of stocking a hive.
4. Give suitable tools required when harvesting honey.

### **SITING THE HIVE**

Siting a hive is the selection of suitable place to put a bee hive.

#### **Factors to consider when siting a hive**

Bees require certain conditions in order for them to stay longer in a particular place.

So when you are planning to place a hive in a certain place, certain factors have to be considered in order to meet the conditions bees need for their well being.

These include:

- i. The hive should be located away from houses, roads and animals
- ii. The hive should be in a quiet place
- iii. The hive should be near to plants
- iv. The hive should be near a water source
- v. The hive should not be direct to sunlight.

**Note:** if the above conditions are not met, the bees will swarm.

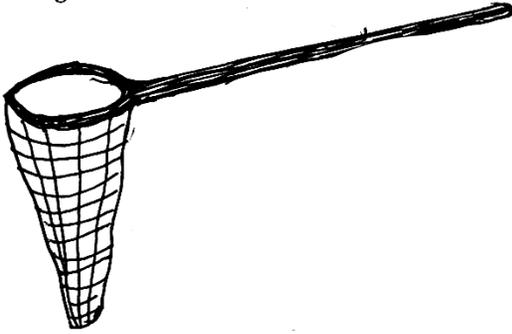
#### **Stocking the hive**

This is the act of putting honey bees in an empty bee hive/ the act of encouraging honey bees to occupy an empty hive.

#### **Ways of stocking a hive**

- i. Setting up the hive in a permanent place
- ii. Using a catcher box
- iii. Catching a swarm

## A swarm catching net



## Harvesting honey

This is the removal of honey combs from the hive.

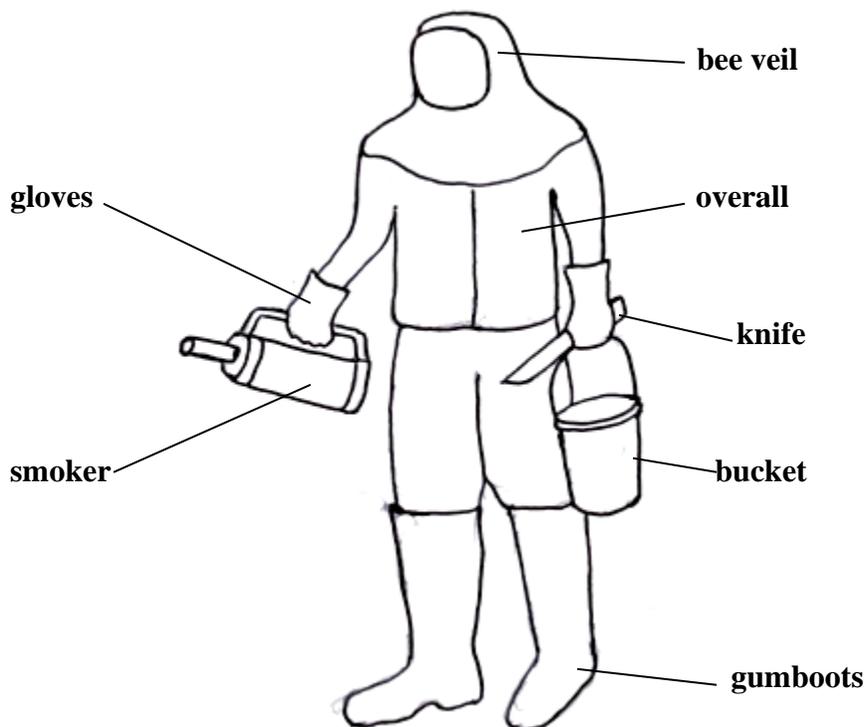
Honey harvesting has to be done very carefully to protect the harvester against being stung by bees and to prevent the bees from swarming.

Because of that it is better to harvest honey either in the early morning or late evening when the bees are calm.

*To ensure successful harvesting of honey, the honey harvester must have the following:*

- i. A bee veil
- ii. Overall
- iii. Knife
- iv. A bee keeper gloves
- v. Gumboots
- vi. Smoker
- vii. Clean bucket

## Protection used by honey harvester



## Uses of each requirement above

- i. **Overall and bee veil**
  - To protect the body of the harvester from bee stings
- ii. **Smoker**
  - Provide smoke that calms bees.
- iii. **Gloves**
  - To protect the hands of a person from bee stings
- iv. **Gumboots**
  - To protect the legs from bee stings and sharp objects from piercing them.
- v. **Knife**
  - For cutting honey combs.
- vi. **Bucket**
  - For collecting and storing honey for some time.
  - Put the combs in a bucket.

## Exercise

1. What is honey harvesting?
2. Why should harvesting of honey be done in the late evening?
3. State two ways a harvester can protect him/herself against bee stings during harvesting of honey.
4. Give one reason why a bee harvester must have a bucket.

## Lesson 5

**By the end of this lesson, the learner should be able to:**

1. Define honey extraction.
2. Identify the different methods of extracting honey.

### **Extraction of honey**

After harvesting honey, it then has to be removed from the honey combs such that it can be used in different ways. This is what is called extraction of honey.

*Extraction of honey therefore is the act of removing honey from honey combs.*

### **Methods of extraction of honey**

There are three ways of extracting honey. These include;

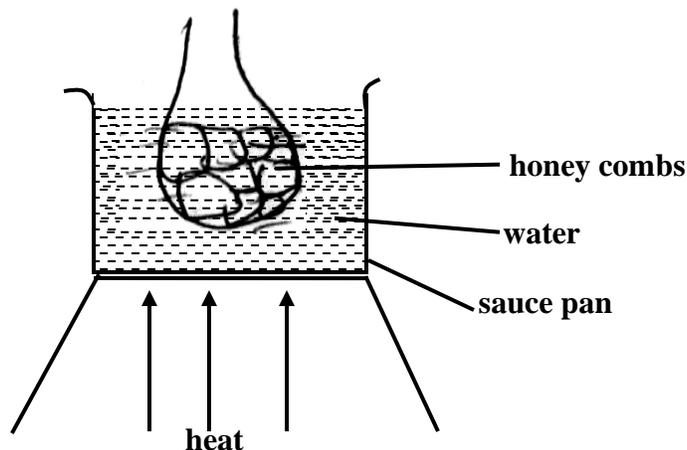
- i) Floating the wax method
- ii) Pressing honey method
- iii) Centrifuging method

## Floating the wax method

### Steps taken

- i) Break honey combs into smaller pieces and put in a sauce pan.
- ii) Put that sauce pan with combs in boiling water.

### Diagram showing honey extraction using floating the wax method



### Observations

- i) Later the wax and honey will melt
- ii) The wax then floats on top of the honey

### Conclusion

- i) Put the mixture in the honey sieve and leave it hanging for a night.
- ii) The honey will then filter through.

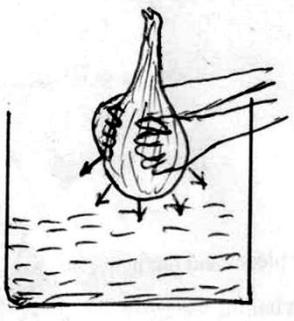
## Pressing the honey method

This is a method of squeezing honey combs to remove honey.

### Steps taken

- i) Break honey combs into pieces.
- ii) Tie or wrap those pieces in a clean cloth.
- iii) Suspend the cloth on a bucket to allow the honey to drip through.

### Illustration



### **Centrifuging method**

This is a method of honey extraction where a machine is used to remove honey from the combs.

The machine used is called a **centrifugal honey extractor**.

### **Steps taken**

- i) Remove the wax that seals the honey combs.
- ii) Place the honey combs in the machine (centrifugal honey extractor).
- iii) The machine then will turn the honey combs at a very high speed.
- iv) The honey will then be forced out and it settles at the bottom of the machine.
- v) The honey is then boiled and stored in a clean container.

### **Structure of a centrifugal honey extractor**



### **Exercise**

1. State two methods of extracting honey.
2. Why is it bad to harvest honey using fire?
3. Why do bee harvesters need buckets?
4. Name any two protective materials a honey harvester should have.
5. How is a smoker useful during honey harvesting?
6. State the role of a centrifugal honey extractor in bee keeping.

*Stay home stay safe.*