

2 sets

# Siv college of education

SEMESTER -IV

## SCHOOL INTERNSHIP RECORD

(Teachine practice of 20 iessons in each pedagogy)

Methods of teaching - Biological Science

Name of the teacher trainee:

Register No:

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# INTERNSHIP LESSON PLAN ÷ 01

## PRELIMINARY INFORMATION

NAME OF THE STUDENT TEACHER :-

SUBJECT : Biological Science

UNIT :-

**8. Challenges in improving agricultural products**

Regd No :-

CLASS :- IX

Time :- 45 min

TOPIC :- Organic manures, soil testing, Vermicompost

NAME OF THE SCHOOL :- Kavya High school

DATE :- 03-2-2020

Academic Standards :

Key Concepts :

- ~~1. Agriculture - Introduction.~~
  - ~~2. Methods to increase food production.~~
  - ~~3. The relation between agriculture and irrigation.~~
  - ~~4. Nutrients required for a plant.~~
  - ~~5. Crop relation - Necessity / need.~~
  - ~~6. Cultivating mixed crops.~~
  - ~~7. Organic and synthetic manures.~~
  - ~~8. Soil testing - Termi compost~~
  - ~~9. Organic farming.~~
  - ~~10. Natural pest controlling methods.~~
- I. Conceptual Understanding :
- The students will
1. explain about various agricultural products.
  2. identify (find out) the relation between irrigation and agriculture.

II. Asking questions and making hypothesis :

The students will

1. enquire about the benefits of crop rotation.
2. imagine the benefits of organic farming.

III. Experimentation and field investigation :

The students will

1. using the soil testing methods of the lab, examine the various samples of soil.
2. conduct the process for preparing vermi compost.

IV. Information Skills and Projects :

The students will

1. gather information, about the methods adopted by the farmers for cultivating various crops.
2. prepare a report on the annual income of the farmers of the village.

V. Communication through drawing and model making :

The students will

1. draw the diagrams of different crop plants.
2. with the help of graphs, explain the production of various crops.

Period No

Teaching Point

**F. Organic manure**

Do you ever saw a herd of goats in a vacant field? Why shepherds make arrangements to stay their goats and sheeps in the fields?

The organic (natural) manure is produced by decaying the plant and animal wastes! The manure produced from decomposed plant and animal products has more organic material. This gives good nutrients to the soil. It makes the soil fertile. Because of humus, the natural manure, water holding capacity of soil is increased.

Natural organic manures are generally divided into two types. One is Concentrated organic manures and the other is Macro organic manure.

Groundnut, Gingelly, Castor, Coconut, Neem, Jetrappa Seed powders are the examples of Concentrated organic manures. These are also used as fodder for cattle and poultry.

Teaching Strategy

\* Discussing and explaining about organic Manures

Resource

\* collection observation Intereence

Evaluation

\* What is meant by green leaf Manure ?

**5: Percentage of nutrient elements in organic manure (kg/ton)**

Manure	Nitrogen	Phosphorus	Potassium
Goat manure	5-7	4-7	3-4
Dry compost	5-10	4-8	6-12
Dry organic manure	4-15	3-9	3-10
Neem powder	5-6	1-2	1-2
Vermi-compost	11-3	1-2	1-2

\* collection of organic manure

\* Discussion Explanation

Period No.	Teaching Point	Teaching Strategy	Resources	Evaluation
	<p>levels. If you send the sample of soil from your field, they send you a report after testing it. By the report you will be able to know that which nutrient is lesser and which is more. This helps the farmer to select the type of crop, manure, fertilizer etc and its quantity. This prevents wastage and minimizes investment.</p> <p><u>Vermi Compost</u></p> <p>To replenish soil nutrients, adding of natural manure is a good practice. Vermicompost is one of the techniques in soil nutrient management. Let us read the following case study to know about vermi compost.</p> <p>The farmers are Bomma Raju Chervu of Vinjamur Mandal faced many problems in using of chemical fertilizers. They searched for alternate practices. Farmers understand the importance of soil health. They formed a group to grow vermi compost with the help of Agriculture Field Officers of DOT centre.</p> <p><u>H. Soil testing</u></p> <p>How do farmers know what type of crop needs to be cultivated? What types of crops are suitable for the soil in their fields? Farmers, who are experienced, are able to make out from the colour and texture of the soil.</p> <ul style="list-style-type: none"> <li>You had also studied about the same in your earlier class. Ask a farmer to find out about crops that can be grown in different types of soil.</li> </ul> <p>Nowadays, Agricultural officer and the Soil Testing Technologist are available in</p>	<p>* EXPLANATION about Vermicompost and discussing the Pre-Preparation</p> <p>* Why and where the soil is tested</p> <p>* What advice user Discuss with the farmers</p>	<p>* coconut-banana and sugar cane leaves.</p> <p>coconut fibre dried black gram cow dung</p> <p>* Report on soil testing</p>	<p>* what are gradients used in Vermicompost</p>

# INTERNSHIP LESSON PLAN - 02

## PRELIMINARY INFORMATION

Name of the student teacher:-

Reg No -

Subject :- BIOLOGICAL SCIENCE

Class :- IX

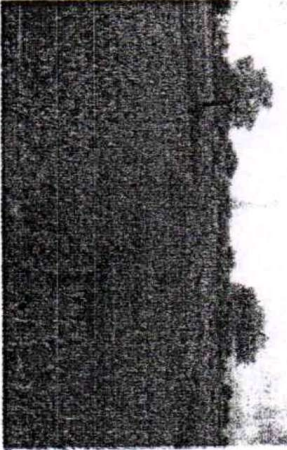
Unit :- 8. Challenges in improving agricultural products

Time :- 45 min

Topic :- Mixed crops

Name of the school :- Kavya High School

Date :- 04-2-2020

Period No	Teaching Point	Teaching Strategy	Resource	Evaluation
	<p><b>E. Cultivating mixed crops</b></p> <ul style="list-style-type: none"> <li>• Have you ever seen two types of crops in the same field?</li> <li>• Which crops are grown in this way?</li> <li>• What are the uses of cultivating mixed crops?</li> </ul> <p>Discuss in groups and display your writings in your classroom.</p> <p>If more than one crop is cultivated in the same field then it called mixed crop. Because of mixed crop cultivation the soil becomes fertile. The nutrients which are used by one crop will be regained by cultivating another crop.</p> <p>Which crops can be cultivated as mixed crops? Observe the following...</p> <ul style="list-style-type: none"> <li>Soya grown along with Pea</li> <li>Pea grown along with Green gram</li> <li>Corn grown along with Black gram</li> <li>Groundnut grown along with sunflower</li> <li>Maize grown along with Red gram</li> <li>Sorghum grown along with Pea</li> <li>Cotton grown along with Groundnut</li> </ul>  <p><i>Fig-5 Red gram in Haldhi</i></p>	<ul style="list-style-type: none"> <li>* Discussing about the benefits of cultivating mixed crops</li> <li>* Discussing about the different types of crops which can be cultivated as mixed crops.</li> </ul>	<ul style="list-style-type: none"> <li>* Discussion</li> <li>Explanation.</li> </ul>	<ul style="list-style-type: none"> <li>* What is the benefit we get from mix-crop cultivation?</li> <li>* Root nodules of which plant passes bacteria?</li> </ul>

Period No.

### Teaching Point

Generally pulses and cereals are grown as mixed crops. Short term crops are grown in Long term crop fields. In the fruit growing fields like Lemon, Pomegranate, Papaya, etc., pulses like Red gram, Black gram, Green gram, etc., are cultivated as mixed crops.



Fig-7 Beet Leaf

- Is beetel (Tamalapaku) a mixed crop? How can you justify your answer?
- Can you name some leguminous crops? Leguminous crops usually have many small nodules on their roots. Several different kinds of bacteria live in these nodules. These bacteria absorb nitrogen from the air and convert it into a form that can be used by the plant.
- Ask your teacher about names of the nitrogen fixing bacteria.  
You could uproot a soya bean plant or a Bengal gram plant to see the nodules on their roots.

### Teaching strategy

\* creating awareness regarding mixed crops

### Resources

\* Text book

### Evaluation.

\* Discussion

# INTERNSHIP LESSON PLAN - 03

## PRELIMINARY INFORMATION

Name of the student teacher :-

Reg No -

Subject :- BIOLOGICAL SCIENCE

Class :- IX

Unit :- 8. challenges in improving agricultural products

Time :- 45 min

Topic :- Required nutrients for the plant.

Name of the school :- Kavya High School

Date :- 05-2-2020

Period No

Teaching

Point

B. Plant nutrients

Just as we need different kinds of nutritious food, plants also require different kinds of nutrients. You know that a plant absorbs carbon dioxide from the air and water from the soil and produces carbohydrates with the help of sunlight.

Table-3: Absorption of salts by different crops (Units: Kg / Hectars / Season)

Crop	Yield per hectare	Nitrogen	Phosphorus	Potassium
Rice	2,240	34	22	67
Wheat	1,568	56	22	67
Millet	1,792	56	15	146
Corn	2,016	36	20	39
Sugarcane	67,200	90	17	202
Groundnut	1,904	78	22	45

Every time, any of these crops sown in a field, absorb these amounts of nutrients.

C. Nutrients in Soil

- If a field is cultivated for many years, what would happen to the nutrient content of the soil?
  - How does the soil get back or replenish these nutrients?
- Let us examine this question in more detail.

Plants also absorb different kinds of mineral salts from the soil, in addition to water. Among these are the salts that plants require in larger quantities. For example, plants need Nitrogen, Phosphorus and Potassium salts in larger quantities. These are called Macro Nutrients. Some nutrients are necessary for plants in small quantities.

Teaching Strategy

\* using tabular form, explaining about the different chemical substances required for different crops, identifying the macro and micro nutrients

\* Discussing about what happens if the same crop is cultivated for many years in the same field

Resource

\* Analysis & Explanation

\* Chart showing Micro and Macro nutrients

Evaluation

\* What are Macro nutrients?

\* Give examples of Macro nutrients?

Period No

Teaching Point

Teaching Strategy

Resources

Evaluation

D. Crop rotation

Usually, farmers do not grow only one crop in a field. Different crops are grown in different seasons. It has been seen that cereal crops take a lot of nutrients from the soil. Legumes are different. While they do take nutrients from the soil, they also provide some nutrients to it. Growing leguminous crops result in an increase in

Table-4:

Nutrient	Uses
Nitrogen	New leaves, flowers arise fast.
Phosphorus	Helps roots to penetrate deep in to the soil to absorb nutrients quickly
Potassium	Resistance towards pests, increases the quality of smell, colour, and taste of fruits.

To avoid nutrient deficiency in the soil, farmers cultivate alternate crops.

- A farmer cultivated sugar cane in his land for the last five years. Another farmer cultivated sugarcane in the first year and soya bean in the second year and sugarcane in third year.
- In which case do you think has the land lost most of its nutrients?

Crop rotation is the process in which one crop is followed by another crop on an agricultural field. Some best combinations for crop rotation are given below.

- After cultivation of paddy, blackgram/groundnut has to be grown, followed by paddy again for cycle to continue.
- After cultivation of tobacco, mirchi has to be grown for the cycle to go on.
- After cultivation of redgram, maize/ paddy has to be grown for the cycle to go on.

\* Discussing and explaining the benefits of crop rotation

\* Chart showing micro and macro nutrients

\* Using the tabular form discussing about the utility of various nutrients and their effect on plants

# INTERNSHIP LESSON PLAN - 04

## PRELIMINARY INFORMATION

Name of the student teacher:-

Reg No -

Subject :- BIOLOGICAL SCIENCE

Class :- IX

Unit :- 8 - Challenges in Improving Agricultural Products.

Time :- 45 min

Topic :- What does a Plant do with water

Name of the school :- Kavaya High School

Date :- 06-2-2020

Teaching Point

What does a plant do with water?

We learned in the chapter 'Nutrition in plants' in Class 7 that a plant absorbs water from the soil. What does it do with this water? We know that the plant combines water and carbon dioxide with the help of sunlight to produce carbohydrates. Starch is one such carbohydrate. Different types of sugar and cellulose are also carbohydrates. A chemical analysis will show that 100 grams of water react with 260 grams of carbon dioxide to form 180 grams of carbohydrate.

But the plant roots does not use all the water it absorbs through its roots to produce carbohydrates. Actually, most of this water evaporates into the air.

Activity-1

Take a polythene bag. Cover the bag on leaves and tie it. Keep it 4-5 hours. You observe it. What did you find in the polythene bag? Where did they come from? Do this experiment during day time and night time separately. Note the differences in your note book.

Teaching Strategy

\* conducting an experiment to know about how much amount of water absorbed from the soil. it is utilized by the plant and explaining about it.

\* Discussion on the types of plants and methods of cultivation are dependent on water resources.

Resource

\* Experimental observation

\* Drawing the diagrams

\* Potted plants  
Polythene cover  
\* Discussion  
Explanation  
Drawing skills

Evaluation

\* How much of water is utilized by a plant to produce 180 grams of carbohydrate?

\* What is the role of vascular bundles in transpiration of water?

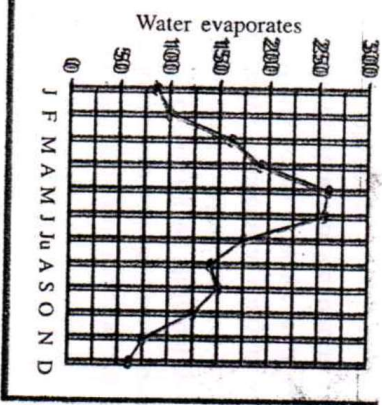
Teaching Point

If you tie a plastic bag over a leaf, you will be able to see how much water a plant releases in the air. It is estimated that a plant uses only 0.1 percent of the water it absorbs to form carbohydrate.

That means, if a plant absorbs one litre of water, only one millilitre will be used to produce carbohydrate. The remaining 999 millilitres evaporate from the leaf.

The relationship between water and crop yields

You may have wondered what difference it would make if water is scarce when only 0.1 percent is used to produce carbohydrate. Let's investigate the matter a little more in depth. Graph 2 below shows us how much water evaporates from plants in different seasons.



Graph-2

- Find out from the graph the months in which the most water evaporates from plants.
- Are these the same months in monsoon season when the rainfall is heavy?
- So how does the availability of more water affect the plant?

Teaching Strategy

\* Discussing about the water management practices when the water is scarce

Resources

\* Chart of Village showing the various irrigation techniques

Evaluation

\* What is transpiration

\* Picture of any dam available in that area.



comprehension  
of concepts  
doing  
activities  
discussion

1) Adaptation as a response to adverse situations

Some adaptations, to cope with adverse situations, are quite peculiar and prominent and yet go unnoticed by us.

Observe these pictures. You may find many kinds of organisms living underground like this. Why did they choose such places?

Many organisms that live in the hot deserts or polar regions migrate to the deeper layers of the earth to protect themselves from the extreme conditions of heat and cold. For example seasonal adaptations can be seen in amphibians like frog. To protect themselves from the extremes of hot and cold conditions they burrow deep in the ground and remain motionless until the conditions are favourable. During this period the rate of metabolic activities slow down and the animal goes into a nearly unconscious sleepy condition called *Hibernation* (winter sleep) and *Aestivation* (summer sleep).

- Collect information about hibernation and aestivation and make news bulletin. For this your need to go for library or internet and also take your teachers help for more examples.

students are discussing the adaptation in response to adverse condition.

Q) What is hibernation?

A) some organisms protect themselves from the extremes of hot and cold conditions they burrow deep in the ground and remain motionless until the conditions are favourable. In this period the rate of metabolic activities slow down and the animal goes into a nearly unconscious condition.

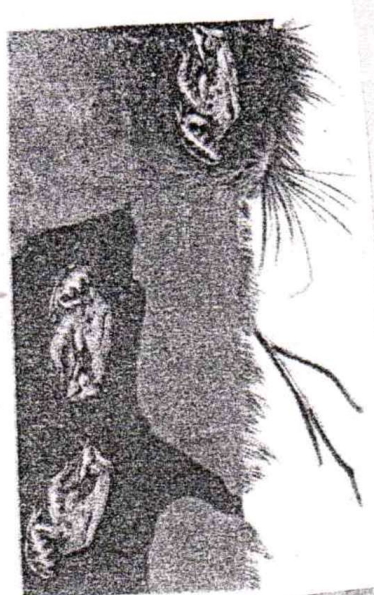


Fig-16 Hibernation

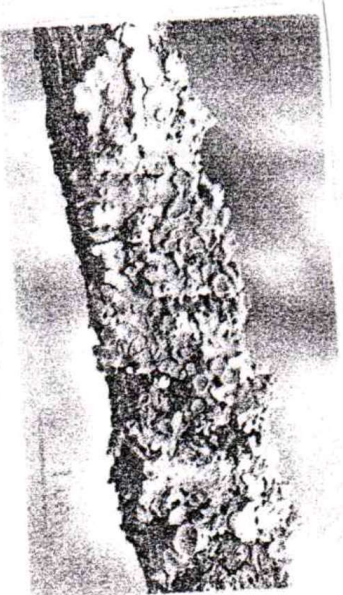


Fig-17 Lichen

pictures of adaptations in animals  
unconscious sleepy hibernation.

Lichens

You may have observed greenish areas on the bark turn into a greyish whitish mass and then to a peculiar flaky or greenish growth. What do you think it is? A flavouring agent in the name of 'pathar phul' is used in preparing biryani. It is also a type of lichen.

The above picture shows the successful adaptation of algae and fungi colonies. The fungus colony attacks an algal colony where most of the algal colony that fails to compete dies out. The more adaptive forms live on to form symbiotic relationship with the fungi in colonies called Lichens. The figure shows such a colony growing on a tree trunk. The fungus provides water and minerals to the alga, while the alga performs photosynthesis and supplies food in the form of sugars to the fungus. Due to such symbiotic adaptations lichens are able to survive even in extreme conditions.

Adaptation to environment is not a simple phenomena. If we keep our cow in a desert it will be modified like a camel. If a giraffee is kept in a forest with short trees or plants it would not convert like a goat. Adaptation takes place over a long period of duration. ) 7

Teaching strategy

what are lichens  
The fungus colony attacks an algal colony  
The more adaptive forms live on to form symbiotic relationship with the fungi in colonies called lichens.

# INTERNSHIP LESSON PLAN - 06

## PRELIMINARY INFORMATION

Name of the student teacher:-

Reg No -

Subject :- BIOLOGICAL SCIENCE

Class :- IX

Unit :- IX ADAPTATIONS IN DIFFERENT ECOSYSTEMS

Time :- 45 min

Topic :- Fresh water Eco-system

Name of the school :- Kavya High School

Date :- 10-2-2020



### Teaching point

**Littoral zone:** The shallow zone near the shore is also called as littoral zone. The water near the shore is usually muddy or turbid. This topmost and warmest zone at the edge of a water body is home to snails, clams, insects, several crustaceans, fishes and amphibians and the eggs and larvae of dragonflies etc.

Several organisms in this zone have well developed sight, usually have dull and greyish bodies and are fast swimmers. Plants like mosses, water lily, Vallisneria, hydrilla etc are found here along with several types of algae. High photosynthetic activity occurs in this zone. Predators of this zone are tortoise, snakes and ducks.

The **limnetic zone** is the open water zone at the top of the water body and consequently receives a good deal of light. This zone contains a variety of freshwater fish with bright shiny, greyish or silver black scales that help them to merge with the surroundings. Transparent or whitish bodied crustaceans like daphnia, cyclops, small shrimps are also found in this zone. There are different types of floating plants like water hyacinth, wolffia, pistia along with a variety of algae. Photosynthetic activity is highest.

Both littoral and limnetic zones are photic zones.

### Teaching strategy

what is the littoral zone?  
The shallow zone near the shore is also called as littoral zone.

what are the organisms found in littoral zone?  
Mosses, water lily, Vallisneria, hydrilla, tortoise, snakes, and ducks

what are the organisms found in limnetic zone?  
Daphnia, cyclops, hyacinth, wolffia, pistia,

### T.L.M Resources

students are explained that the littoral zone, and they blank and Animal

students are explained that the limnetic zone

Teaching point

The profundal zone is dimly lit and cold. Mostly heterotrophs (animals that eat dead organisms) are found in this region. Most of the animals, the so called bottom dwellers, that live here are mostly scavengers and predators, for example crustaceans, crabs, fishes like eels and

glossogobius(isika dondu), snails, turtles etc. They adapt themselves by feeding on dead animals that settle down. Many kinds of bacteria (detritus) thrive here that help in decomposing the dead organisms. Mud of the bottom floor, tiny particles of dead and decaying matter of plants and animal bodies make the water very turbid. Hence the bottom dwellers, rely mostly on smell and auditory (related to hearing) senses rather than vision to acquire their food.

The surface layers in the lake ecosystem gets heated while the deeper layers remain cool during day time. Often some organisms migrate to deeper layers during the day and reach the surface layers during night time when it cools down.

Other organisms found are like-  
Mammals (like badgers, otters) live near water and are capable of swimming to catch their main food source, particularly fish.

Teaching strategy

In this zone is dimly lit and cold.

students are

recall that they adapt themselves by feeding on dead animals that settle down. Many kinds of bacteria have here that help in decomposing the dead organisms.

TJM Resources

students are explained that the profundal zone.

Amphibians and reptiles like toads, frogs, alligators, crocodiles, salamanders start life underwater as eggs and tadpoles, and then move to ground as adults.

Insects such as skaters, water beetles, mosquitoes and dragonflies can skim over the surface of ponds, playing a critical role in the food supply for other animals.

Many species of ducks, geese and swans also reside in and around the lake ecosystem feeding on a number of different items including fish.

- Think, why birds live in and around ponds have webbed feet?
- Why cranes have long legs and long beaks?

**Activity-3**

You know some of the animals that reside in and around lake or pond. Make a list of those animals and the characteristics of their body.

Webbed feet of these help them to adapt to conditions on land as well as in water. Webbed feet and streamlined bodies have enabled them to be good swimmers. Wading birds such as herons and egrets which have long thin legs wander through the mud shallows searching for insects.

Students are recall that Amphibians and reptiles like frogs, alligators, crocodiles, salamanders start life under water as eggs and tadpoles, and then move to ground as adults.

students are observed the activity

# INTERNSHIP LESSON PLAN - 07

## PRELIMINARY INFORMATION

Name of the student teacher:-

Reg No -

Subject :- BIOLOGICAL SCIENCE

Class :- IX

Unit :- IX ADAPTATIONS IN DIFFERENT ECO-SYSTEMS

Time :- 45 min

Topic :- Water salinity and fish adaptations

Name of the school :- Kavya High School

Date :- 11-2-2020

### Teaching Point

#### Water salinity and fish adaptation

Different fish species have very different tolerances for water salinity. All marine and freshwater fish maintain a constant internal salt concentration, which is midway between that of fresh water and sea water. Several marine species have a lower internal salt concentration than that of the water they swim in, so they tend to dehydrate as water is lost by osmosis. To compensate, they drink large amounts of water, and excrete the salts both via their kidneys and through highly specialised cells in the gills.

In contrast, freshwater fish have a higher internal salt content than their medium, and they tend to bloat, because osmosis leads to excess water entering the body through the permeable membranes in the mouth and gills. The water can be excreted in the form of urine, but to maintain a suitable salt balance freshwater fish need to reabsorb salt through the kidneys, and collect additional salts through salt-collecting cells in the gills.

It is the ability to regulate this salt absorption that determines the tolerance of a freshwater fish for saline water. When the water salinity level exceeds the fish's ability to adjust its salt regulation mechanisms, the delicate salt and fluid balance is upset and the fish dies.

### Teaching Strategy

TJM

Resources

what are the water salinity  
 Different fish species have very  
 different tolerances for water  
 salinity.

students are recall that marine  
 species have a lower internal  
 salt concentration than that of  
 the water they swim in, so they tend  
 to dehydrate as water is lost by  
 osmosis.

How to use of osmosis?

In contrast, freshwater fish have a  
 higher internal salt content than  
 their medium, and they tend to bloat,  
 because osmosis leads to excess water  
 entering the body through permeable  
 membranes in the mouth and gills.

Teaching point

During summer the water in the lakes gets heated up and evaporates. Other requirements necessary to the organisms, like oxygen and nutrients gets decreased. This leads to the death and decomposing of organisms which makes living conditions unsuitable. In cold regions, the extreme low temperatures, the water in the lakes and ponds gets frozen, killing all the organisms.

- How are marine ecosystems different from fresh water ones?
- Write two types of adaptations you find in marine ecosystems, different from freshwater ecosystems.
- What are the similarities in adaptation on the basis of light penetration in the two aquatic ecosystems?
- Which zone do you think, when compared to marine ecosystem, is absent in freshwater ecosystem?
- What would be a major factor leading to different types of adaptations in marine, freshwater ecosystems?

Teaching strategy

students are recall that between summer and winter organisms gets decreased decomposing.

# Teaching point

Partially submerged plants have numerous air spaces inside the stems, leaves, roots that aid in gaseous exchange and buoyancy. Leaf bases of water hyacinth (*Eichhornia crassipes*) form air filled structures to keep them afloat. In water lilies leaves are flat, have an oily

surface with stomata present on the upper surface of the leaf, while incompletely submerged plants like hydrilla, stomata are absent, leaves are thin, stems are highly flexible. The main adaptations that give hydrilla an advantage over other native plants are: it can grow at low light intensities, it is better at absorbing carbon dioxide from the water (diffuses into leaves), it is able to store nutrients for later use, it can tolerate a wide range of water quality conditions for example salinity (can grow in saline waters as well), and it can propagate sexually and asexually. )

# Teaching strategy

In water plants and based on external, internal structures.

## Adaptations in some aquatic plants

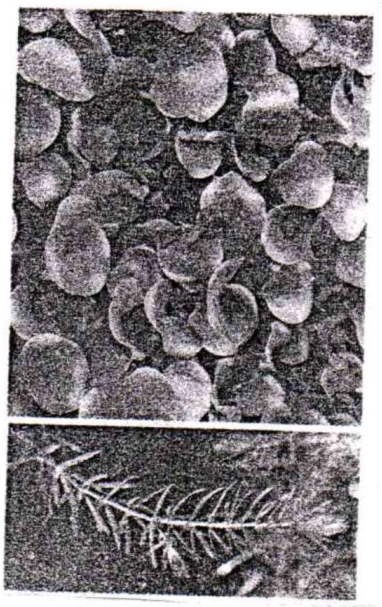


Fig-13(a) water hyacinth (floating) hydrilla (submerged)



Fig-13(b) Water lily (emergent)

no

step

Teaching point

Teaching strategy

T.L.M / Resources

Evolutions

- Ques: What are the types of fresh water ecosystem?
- ① what are the organisms found in limnetic zone
- ② what are the organisms found in littoral zone
- ③ what are the water salinity

# INTERNSHIP LESSON PLAN - 08

## PRELIMINARY INFORMATION

Name of the student teacher:-

Reg No -

Subject :- BIOLOGICAL SCIENCE

Class :- IX

Unit :- IX ADAPTATIONS IN DIFFERENT ECO-SYSTEMS

Time :- 45 min

Topic :- Other adaptations

Name of the school :- Kavya High School

Date :- 12-2-2020

comprehensive of concepts doing activities

Teaching Point

6/ Other adaptations

Adaptation to temperature in plants

The effect of temperature on plants terrestrial ecosystem can be seen in different ways.

- Do all plants shed their leaves at same time in a year throughout the world.

Some plants in temperate regions shed their leaves before the winter starts. This is to minimize transpiration loss as well as reduce photosynthetic and other metabolic activities, as low temperature renders several chemicals inactive for some time. In tropical regions some plants shed their leaves before the start of summer. Plants growing in hot

Teaching strategy

students are

Discussion about:

Adaptations found

in respect to

temperature

For this topic what

is ecosystem can see

Terrestrial ecosystem

what do plants

shed their leaves

during summer

In summer

regions some plants

shed their leaves

before the start

of summer plants

growing in hot

climates.

T.J.M Resources

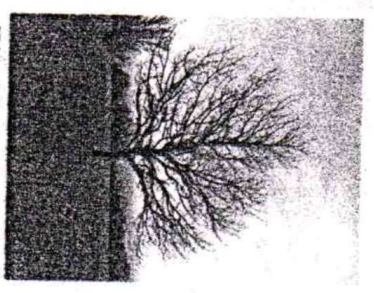


Fig-14 Fall season modified stem

Discussion on other Adaptations

### Teaching Point

climates, usually keep the stomata closed during the day to reduce transpiration loss. High temperatures also lead to adaptations like reduced leaf.

Let us recall why xerophytic plants have modified stems and leaves.

- Are thorny leaves also an adaptation to temperature?
- If the trees have broad leaves at the time of snow fall season what will happen?

### Adaptation to temperature in animals

Heat changes occur due to increase or decrease in atmospheric temperatures. These changes greatly affect the life of organisms in different ecosystems.

In cold regions the upper layers of the lakes get frozen during winter and the lower layers does not. Hence organisms migrate to deeper layers of the lake which is warmer and survive.

- Why polar bear has thick fur on its body?
- In what way thick skin helps the seal to protect from cold weather?

### Teaching Strategy

Students are

recall xerophytic plants have modified stem and

leaves.

Are thorny leaves

also an adaptation to temperature.

Yes

How do animals

posses adaptation in

polar region?

They have a

thick layer of

fat deposited under

their skins, or thick

fur coat or hair

covering their

### T.J.M Resources



Fig-15(a)  
Polar bear



Fig-15(b) Blue whale

Explanation of temperature in animals

### Teaching point

Animals living in these regions adapt themselves in different ways. They have a thick layer of fat deposited under their skins, or thick fur coat or hair covering their bodies. These act as insulators preventing heat loss from their bodies. The fat not only insulates the body but helps in producing heat and energy. Such adaptations can be seen in whales, seals, bears etc. } 16

### Evolution

### Teaching strategy

bodies. These act as insulators preventing heat loss from hair bodies.

T.J.M Resources



Q. Why do plants reduce photosynthesis?

Q. Why polar bear has thick fur on its body?

Q. How do animals possess adaptation in polar & region?

Q. Which are polar region animals?

# INTERNSHIP LESSON PLAN - 09

## PRELIMINARY INFORMATION

Name of the student teacher:-

Reg No -

Subject :- BIOLOGICAL SCIENCE

Class :- IX

Unit :- IX ADAPTATIONS IN DIFFERENT ECO-SYSTEMS

Time :- 45 min

Topic :- The story of Darwin's finches

Name of the school :- Kavaya High School

Date :- 13-2-2020

comprehension  
& concepts  
doing activities  
discussion

### Teaching Point

#### Story of Darwin's Finches

Charles Darwin in the year 1885 landed from the famous ship H.M.S Beagle on one of the islands of around 120 small islands of the group of Galapagos islands. He studied about different organisms of the islands. His most remarkable observation had been about finches (our state bird is also a finch). He was amazed to see that 13 types of finches that differed with respect to beaks and the colour of feather were present in the small region of the Galapagos islands. He noted that some finches eat seeds, while some eat fruits and the others eat insects.

- Try to guess if there any relation between type of food taken and the structure of beak.
  - The seed eaters had thick and heavy beaks.
  - The fruit eaters had stubby beaks.
  - The insect eaters had sharp and long beaks.
- Darwin observed that these birds had adapted to their immediate surroundings

### Teaching strategy

students are

Discussion about displaying the finches & finches

Name the ship on

which Darwin voyage?

In the year 1885

landed from the

famous ship H.M.S

Beagle

what are called the finches?  
We noted finches eat seeds,  
while, some eat fruits  
and the others eat insects.

### T.J.M Resources

chart showing the variations in the beaks

picture of Darwin

for food and shelter and showed a lot of variation even within the same species, especially with respect to the form of beaks. He made a sketch of the same as shown in the above figure. Thus he concluded that adaptation was something that an organism is undergoing continuously, even within very closely related forms in a particularly geographically separated area. *JS*

Evolution

Adaptive Radiation in Galapagos Finches

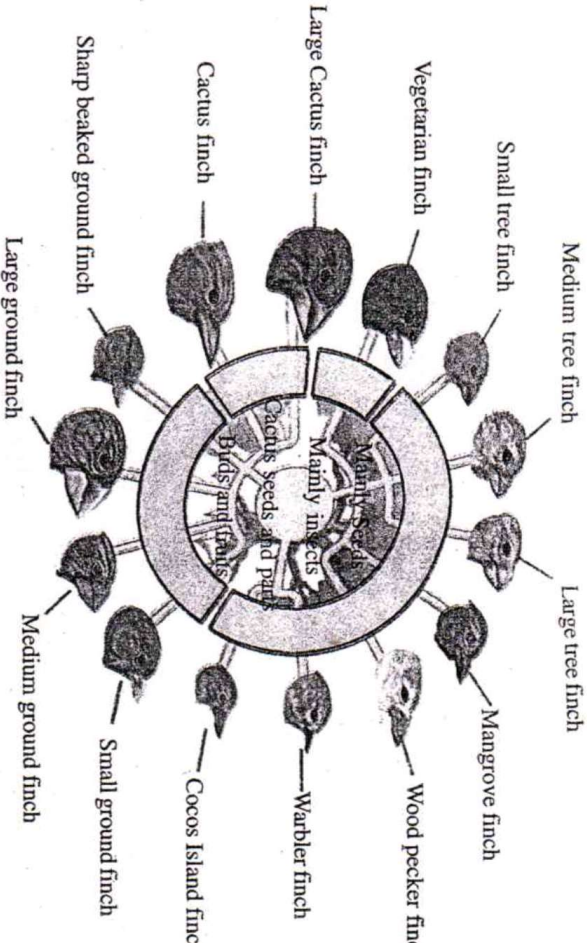


Fig-18

It is concluded Darwin finches name the ship on which Darwin voyage was is the observation

- ①
- ②

# INTERNSHIP LESSON PLAN - 10

## PRELIMINARY INFORMATION

Name of the student teacher:-

Reg No -

Subject :- BIOLOGICAL SCIENCE

Class :- IX

Unit :- IX ADAPTATIONS IN DIFFERENT ECO-SYSTEMS

Time :- 45 min

Topic :- Adaptations on the basis of light penetration

Name of the school :- Kavya High School

Date :- 14-2-2020

step

comprehension of concepts doing activities

### Teaching point

(Adaptations on the basis of light penetration)

#### Euphotic zone

The organisms living in this zone are mostly floaters and swimmers. Animals in this zone usually have shiny bodies reflecting light away to merge with shiny water surface are transparent. These usually have very sharp vision. Plants are mostly green and photosynthetic activity is maximum in this zone. Some flora and fauna of this zone are trouts, herrings, dolphins, jelly fishes, different type of coral colonies which are extremely colourful, different types of algae & sea grasses (emergent plant species: rooted to the sides, in marine ecosystems these are rooted in the continental shelf area) diatoms etc. Nearly 80% of marine flora and fauna are found in this zone.

#### Bathyal zone

Most of the plants found in this zone are the red and brown kelps, sponges, corals even animals with tubular bodies like squids and large animals like whales etc. Some of these have a flat body like the ray fishes. You may have big eyes sensitive to very dim light.

### Teaching strategy

students are

Discussing and explanation about

the adaptations

found in plants and

animals living

in euphotic, bathyal

and abyssal zones.

How many ocean

eco system is

classified ?

ocean ecosystem

are 3 zones.

1. Euphotic zone

2. Bathyal zone

3. Abyssal zone

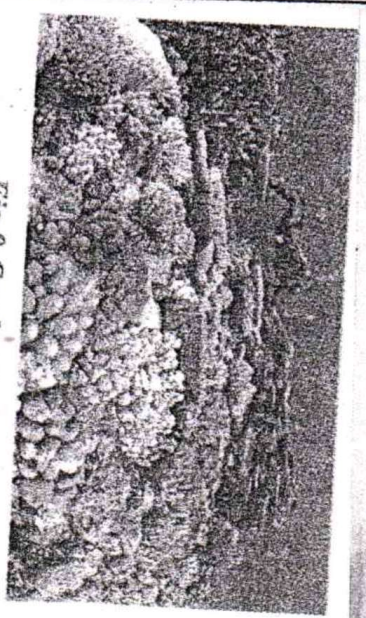


Fig-9 Coral colonies

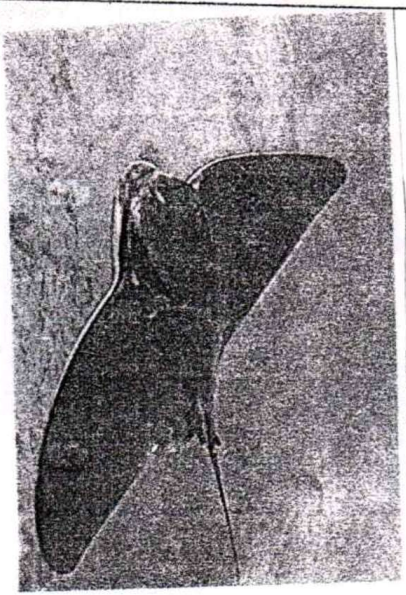


Fig-10 Ray fish

**Abyssal zone**

These zones are dark and cold throughout the year. Photosynthetic activity is absent. Deep sea animals are mostly predators and scavengers. The larger forms have wide mouths and huge curved teeth which prevent escape of any prey. Absence of skeleton, flattened bodies are some other characteristics observed. Some also have special structures that produce light on their bellies, around their eyes (which are usually nonfunctional that is, the organisms are blind) and at the sides of their bodies, some animals glow (shows bioluminescence) in the dark waters.



Fig-11(a)  
Anguar fish

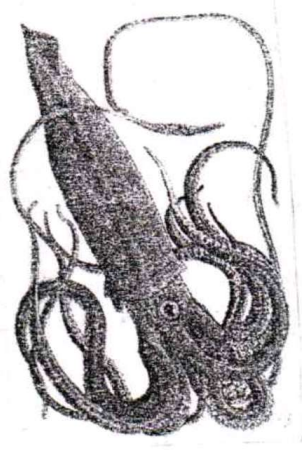


Fig-11(b) Brittle star

Evolution

- 1) what's temperature of bathyal zone
- 2) what are the living plants and animals in euphotic zone?
- 3) what is the depth of Abyssal zone

# INTERNSHIP LESSON PLAN :- 11

## PRELIMINARY INFORMATION

NAME OF THE STUDENT TEACHER :-

REGD NO :-

SUBJECT :- Biological Science

CLASS :- IX

UNIT :- X SOIL POLLUTION

TIME :- 45 min

TOPIC :- Soil Components

Name of the school - Kavya High school

Date :- 17-2-2020

### I. Conceptual Understanding :

The students will

1. explain about pollution, types of pollution, factors of soil pollution, effects of pollution, and controlling methods of soil pollution.
2. explain the differences between bio-magnification and bio-remediation.
3. explain the reasons for urbanization.

### II. Asking questions and making hypothesis :

The students will

1. enquire about the effect of soil pollution on agriculture.
2. explain the adverse effects in future, if the soil is not protected.

### III. Experimentation and field investigation :

The students will

1. observe the natural factors for soil pollution.
2. observe the soil pollution caused by plastics and chemical substances.

### IV. Information Skills and Projects :

The students will

1. prepare a tabular form of the factors causing soil pollution in the surroundings.
2. present a report on the management of wastes formed on the earth.
3. analyse the controlling methods of soil pollution.

### V. Communication through drawing and model making :

The students will

1. prepare a flow chart depicting the controlling methods of soil pollution.
2. present the situations which causes soil pollution in the form of a picture.

No	step	Teaching point	Teaching strategy	T.L.M / Resources
	<p>comprehension &amp; concepts doing activities discussion</p>	<p><b>What is soil?</b></p> <p>Soil is one of the three major natural resources, alongside air and water. It is one of the marvellous products of nature and without which there would be no life. It is a natural medium on the surface of the earth in which plants grow.</p> <p>(Organic matter contains Organisms 10%, Roots 10%, Humus 80%)</p> <p>Soil is made up of minerals and decomposed organic matter, along with air and water. Soil can create a habitat for fungi, bacteria and related organisms, which in turn feed and support plant life.</p> <p>Healthy soil is fundamental to the quality of food it produces and to the health of those who eat the food produced from it.</p>	<p>Discussing and explaining about the formation of soil</p> <p>Soil is soil?</p> <p>It is one of the marvellous products of nature and without which there would be no life.</p> <p>It is a natural medium on the surface of the earth in which plants grow</p> <p>Some of the components that occur in the soil.</p> <p>minerals, organisms 10%, Humus 80%.</p>	<p>observation, discussion</p> <p>explanation of the soil</p>

Our environment is composed of atmosphere, earth and water. The interaction of the atmosphere, lithosphere, hydrosphere and biosphere is continuing for years together. It was clean and enjoyable. But due to the various activities of man, the composition and complex nature of environment got changed. The activities include industrialization, construction, transportation, agriculture and deforestation. Such activities are though desirable for human development and welfare release unwanted materials into the environment causing it to be imbalanced rendering our life miserable.

We have learnt so far about soil formation and its properties in class VII, and also about air and water pollution in previous chapters. Here we will study about 'land pollution'. But before that, let us recall what we have learnt about soil.

We Indians worship earth as mother. We get everything for our living from soil. You have studied about structure of the soil in class VII. Let us recall, what you have learnt in class VII.

How many ways do man activities in environment get changed. The activities include industrialization, construction, transportation, agriculture and deforestation.

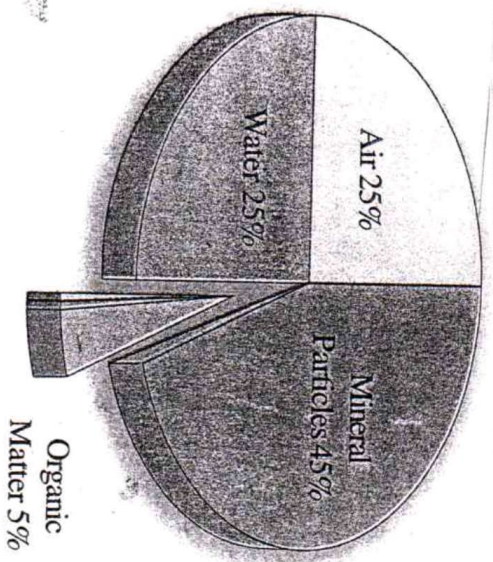


Fig-1 Components of soil

How is soil formed?

Soil formation is a long and complex process and it can take 100 to 10,000 years to create one inch of top soil! It is driven by many factors such as climate, topography, living organisms and the type of parent material. Parent materials come from break down of underlying rocks or from deposits by streams and rivers, seas and gulfs, hills, wind and glaciers or organic plant residues.

Over time, these materials are weathered by the effects of freezing, thawing, wetting, drying, heating, cooling, erosion, plants and animals and from chemical reactions. Eventually the parent material is divided into three horizontal layers, the top layer consists of mostly organic matter and biological activity, the middle layer is the zone of maximum material accumulation and the bottom layer bold is mainly the parent material, but slightly altered.

The top soil is important since it is the foundation for the life on the earth. ) (

Give brief account of soil formation of soil

→ Soil formation is long and complex process and it can take 100 to 10000 years to create one inch of top soil.

→ many factors such as climate, topography, living organisms and type of parent material.

→ parent materials come from deposits by streams and rivers, underlying rocks, seas, and gulfs, hills, wind and glaciers or organic plant residues.

→ over time, these materials are weathered by the effects of freezing, thawing, wetting, drying, heating, cooling, erosion, plants and animals and from chemical reactions.

No	step	Teaching point	Teaching strategy	T.L.M / Resources
	evaluation		<ul style="list-style-type: none"> <li>① what is soil?</li> <li>② Name the component that occur in the soil</li> <li>③ How many ways of man activities in environment get changed</li> <li>④ Give brief account of formation of soil</li> <li>⑤ How many layers in atmosphere</li> </ul>	

# INTERNSHIP LESSON PLAN - 12

## PRELIMINARY INFORMATION

Name of the student teacher:-

Reg No -

Subject :- BIOLOGICAL SCIENCE

Class :- IX

Unit :- X SOIL POLLUTION

Time :- 45 min

Topic :- Soil Properties

Name of the school :- Kavya High School

Date :- 18-2-2020

2 (Soil properties)

Crop quality directly depends on the quality of the agricultural soil in which it is grown. The higher the quality of the soil, the higher the quality of the crop produced. To determine how to obtain high quality soil, we must first understand the fundamental properties of soil. These can be divided into three major categories- physical, chemical and biological properties.

(i) Physical properties of soil

Soil comprises of minerals, organic matter, water and air. The composition and proportion of these components greatly influences soil physical properties including colour, texture, structure and porosity. These properties regulate and affect air and water movement in the soil and thus, soil ability to function. Organic matter is the organic component of soil which includes the residues of dead plants, animals and organisms.

What is depends on crop quality.

crop quality directly depends on the quality of the agricultural soil in which it is grown.

students are explained the soil properties.

What is physical properties of soil?

water, air, colour, texture, structure and porosity.

no step

comprehension  
of concepts  
doing activities  
discussion

### Teaching Point

It consists of nutrients necessary for plants growth such as nitrogen, phosphorus and potassium. Soils which contain 30% or more organic matter are considered organic soil; all other soils are identified as mineral soils. Organic matter in soil improves water infiltration, decreases evaporation, and increases the water holding capacity. Also, where there is organic matter, there will be numerous organisms present helping to convert it back to nutrients and these organisms help to create crumb, ideal for cultivation. Thus, balancing a natural state of soil.

#### (ii) Chemical properties of soil

The term pH is used to indicate the level of acidity or alkalinity of a soil. The range of pH values of a good soil lies from 5.5 to 7.5. Below pH 7 the soils are termed as acidic and above pH 7 alkaline.

The pH of soil is important in determining the type of vegetation that will grow in the soil and the type of organisms that will live there. Also, presence of organic matter in soil has a close relationship with soil pH. Soil richer in organic matter is acidic in nature as a result of degradation of various substances produces various acids in soil. Availability of plants nutrients is strongly tied to the

### Teaching strategy

Explaining the physical, chemical and biological properties of soil

Name the components that occur in the soil?

It consists of nutrients necessary

for plants growth such as Nitrogen, phosphorus and potassium.

are which contain 30% or more organic matter considered

organic soil

what is used to indicate the level

pH is used to indicate the level of acidity or alkalinity of a soil.

Below pH 7 ~~acidic~~

Below pH means acidic

Above pH means alkaline.

### T.J.M Resources

Samples of various types of soil

pH paper, water

### Teaching point

The availability of N, K, Ca, Mg and S tends to decrease with decreasing pH since conditions which acidify the soil such as weathering and plant uptake also result in removal of these nutrients or in decreased microbial activity.

What will happen if there is increase in acidic or basic nature of soil?

#### (iii) Biological properties of Soil

Soil is not a dead mass but an abode of millions of organisms. It is the most abundant and diverse ecosystem on the earth. Soil organisms include both plants and animal forms ranging from sub microscopic viruses to earthworms, to large burrowing animals such as gophers and ground squirrels. Major microbial groups in soil are bacteria, fungi, algae and protozoa. These feed on plant residues burrow the soil and help in aeration and percolation of water.

### Teaching strategy

What are available minerals?

N, K, Ca, Mg, and S

What is biological properties of soil organisms include both plants and animal forms ranging from sub microscopic viruses to earthworms, major microbial groups bacteria, fungi, algae and protozoa

### T.J.M Resources

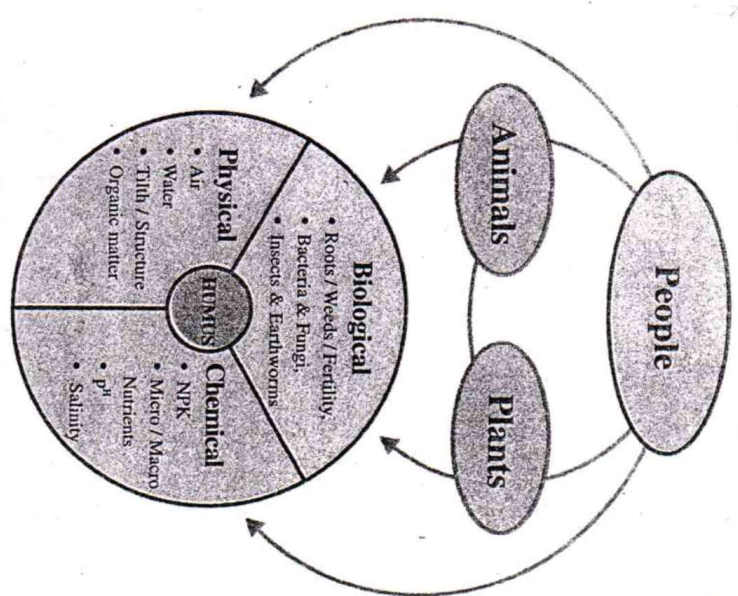


Fig-2 Biological properties of soil

chart showing biological properties

Soil microbes also have influence in controlling the quantities and forms of various chemical elements found in soil. Most notable are the cycles of carbon, nitrogen, sulphur and phosphorus, all of which are elements important in soil fertility. Soil microbes convert organic forms of elements to their inorganic forms and liberate carbon dioxide, ammonia, sulphate, phosphate and inorganic forms of other elements. This process is known as 'mineralization'.

This is the basis of nutrient cycles in all major ecosystems of the world. Besides their role in controlling the rates of production of inorganic forms from various organic forms, soil microbes, particularly, soil bacteria also control the forms of ions in which these nutrients occurs. We shall study this in detail in the chapter of 'Biogeochemical cycles'.

what is mineralization?  
 Soil microbes,  
 various chemical elements  
 cycle of carbon, nitrogen,  
 sulphur and phosphorus  
 organic and inorganic  
 forms, liberate carbon  
 dioxide, ammonia, sulphate,  
 phosphate - This process is  
 known as mineralization  
 Have the soil

Thus, we can conclude that physical, chemical and biological properties of soils affect many processes in the soil that make it suitable for cultivation and other purposes. } 2

# INTERNSHIP LESSON PLAN - 13

## PRELIMINARY INFORMATION

Name of the student teacher:-

Reg No -

Subject :- BIOLOGICAL SCIENCE

Class :- IX

Unit :- X - SOIL POLLUTION

Time :- 45 min

Topic :- Soil Fertility

Name of the school :- Kavva High School

Date :- 19-2-2020

3 (SOIL FERTILITY)

Fertility of soil is closely associated with the properties of soil and is defined by its capacity to hold water and nutrients and supply them to plants when they need them, independent of direct application of nutrients. Transfer of nutrients from the soil's organic matter to the mineral stage strongly depends on the soil organisms' activity and diversity. Soil organisms also contribute to buildup soil organic matter, including humus, the soil's most important nutrient reservoir.

When nutrients are bound in biological or organic form, they are neither lost nor bound to soil particles in a way which makes them unavailable to plants. Therefore, soil fertility can be described in terms of soil organic matter content of the soil, with good living conditions for soil organisms and growing conditions for the roots, which are closely linked to soil structure, the availability of nutrients, the soil's water holding capacity and its biological activity.

It is interesting to know that a major part of the soil microbial biomass is composed of fungi. Important representatives of the soil fungi, the mycorrhizae, grow in symbiosis with about

students are  
Discuss about the  
Fertility of the soil

Students are  
learning about  
good living conditions

for soil organisms  
and growing conditions  
for the roots,

Discussion of the fertility  
of the soil

90% of all plant roots. The plant roots provide sugar for the growth of mycorrhiza. In reverse, the fungus explores the soil and brings back water as well nutrients such as phosphate, zinc and copper that are not easily available to plants. Mycorrhizae enlarge the rooting zone of plants and enter small soil pores, where plant roots cannot access. Improving soil structure, mycorrhizal action in soil and take plant carbon from the air and deposit into soil organic matter and stable soil aggregates.

In addition to the above, soil pH, its acidity or alkalinity, is highly relevant to how readily nutrients become available in soil.

Proper soil fertility management is very important for successful crop production and farming. Organic farmers approach soil fertility management by protecting the soil and feeding it organic material, and then letting it feed the plants in a balanced way. When the soil is fertile in the organic sense, it can produce good crop yields for several years. You learned about organic farming in the chapter 'Challenges in improving agriculture.'

Checks showing  
fertility of soil  
check showing  
nitrogen fixing  
bacteria

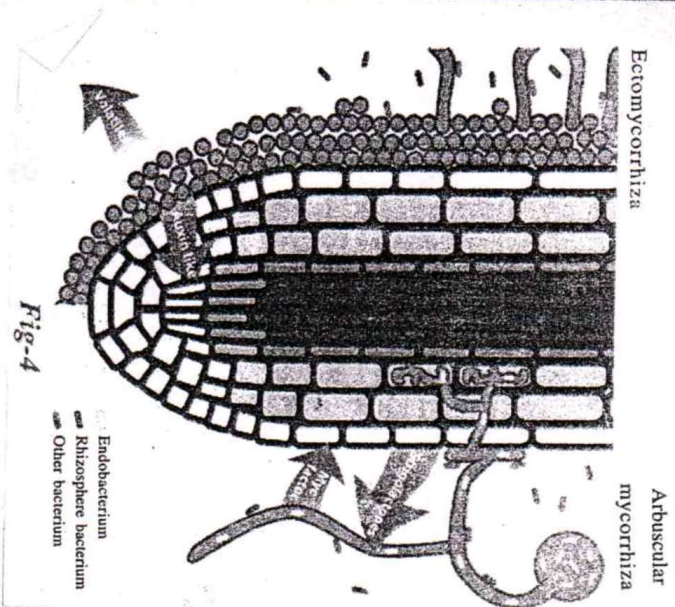


Fig-4

Endobacterium  
Rhizosphere bacterium  
Other bacterium

# INTERNSHIP LESSON PLAN - 14

## PRELIMINARY INFORMATION

Name of the student teacher:-

Reg No -

Subject :- BIOLOGICAL SCIENCE

Class :- IX

Unit :- X - SOIL POLLUTATION

Time :- 45 min

Topic :- Soil Pollution

Name of the school :- Kavya High School

Date :-

20-2-2020

comprehension

& concepts

doing activities

discussion

Soil Pollution

"The Earth, the air, the land and the water are not an inheritance from our forefathers but on loan from our children. So we have to handover to them atleast as it was handed over to us."

- Mahatma Gandhi

As we discussed above, soil serves as the interface between earth, air and water; fulfilling a variety of complex, interdependent functions essential to life. Yet human activities alter its ability to perform its job. As compared to the other resources, it has taken a long time to become aware of the wealth, complexity, usefulness and fragility of the soil. When the quality of air and water deteriorates, the threat to public health is felt immediately. But as long as we can walk on the earth under our feet, where's the danger?

student Discussing about the reasons for soil pollution, (soil decomposition is one reason) students are telling about the soil interface between earth, air and water, fulfilling a variety of complex, interdependent functions essential to life.

The impacts of various human activities for development and welfare are invisible and land pollution is a good example of that. We can't easily see the poisons that seep from underground mines, the garbage we have dip into landfills or from industrialization, agriculture and other mismanagement by human being. Land pollution, in short, is a much bigger and more subtle problem than it might appear. How does it occur? And what can we do about it? These are the questions to think about. But first let us understand up to what extent we are as human being, responsible for producing this waste.

Let us read the following conversation and prepare the list as per the instructions.

During interval time Venu was eating a fruit. He was about to throw the peel in corner of the varandah. His friend Ramu stopped her. Ramu said you should not throw waste in the varandah. Drop it in the litter given.

Now let us think, what will happen if you throw the wastes where ever you want?

Prepare a list of waste materials we throw out in a day from morning to evening classifying them as wet wastes and dry wastes with the help of the example given in the table below.

$$\text{Per capita wet Wastes produced at home} = \frac{\text{Total weight of wet waste materials}}{\text{No. of persons in your family}}$$

S. No.	Wet waste	Dry waste
1.	Vegetable peels	Biscuit wrapper
2.		
3.		
4.		
5.		

Multiply it by 30 = ..... per month  
 Multiply it by 365 = ..... per year

You will be surprised to note this astonishing figure of the waste we are producing in a day. Do you know what happens to the waste materials we produce?

**Activity-1**

Weight the wet wastes, which you have listed in the table for one day. Divide the weight by number of people in your home. The result will be the per capita wet waste we are producing in one day.

**Dumping and decomposing**

We are producing tons of wastes in our daily activities. It is dumped at wherever the vacant place is available in Urban as well

as Rural areas. Some of these wastes are decomposed but some are not. Let us do the following activity. For this you need to observe more than one month.

Take a polythene bag/plastic bucket / or any container. Fill half of it with soil. Keep wet wastes and other wastes in it. (Wastes should include vegetable peels, rubber, plastic etc). Add some more soil and sprinkle water regularly on it. Dig it and observe in 15 days intervals. Note your observations in the table.

vegetable peels, kitchen, waste, banana, plastics, paper, rubber

Material	What has happened in the 1 <sup>st</sup> fortnight	What has happened in the 2 <sup>nd</sup> fortnight	What has happened in the 3 <sup>rd</sup> fortnight
Vegetable peels Vegetable with removed peel Banana Plastic cup paper rubber			

Evaluation

Now think, why some of the waste materials are mixing with soil quickly while some do not? )

(The waste generated from various sources can be categorized into two types:

i) **Biodegradable waste** includes substances that can be degraded by microbes into harmless and non-toxic substances. Agricultural and animal wastes like leaves, twigs, hay, dung, etc. are biodegradable wastes.

more available to plants. Thus, biodegradable materials contribute directly to the fertility of the soil. But when the disposed amount of bio-degradable materials exceed it contributes the imbalance in the nature creating negative impacts. On the other hand, non-biodegradable materials directly contribute to land pollution due to the excessive amount and improper waste management. Thus, soil or land pollution can be understood as addition of substances which

③ How drastic

change in soil and water cause adverse effects?

④ Give examples of biodegradable wastes?

⑤ What is decomposition

# INTERNSHIP LESSON PLAN - 15

## PRELIMINARY INFORMATION

Name of the student teacher:-

Reg No -

Subject :- BIOLOGICAL SCIENCE

Class :- IX

Unit :- X SOIL POLLUTION

Time :- 45 min

Topic :- Soil of Pollutants

Name of the school :- Kavya High School

Date :- 21-2-2020

comprehension  
of concepts  
doing activities  
discussion

### Teaching Point

There are many different ways by which land pollution can occur. Soils are commonly used as dumps for household and industrial wastes. In many intensively farmed areas, leaching of nutrients from manure or inorganic fertilizers and effluents from processing plants may lead to high level of nitrate and other chemicals in ground water. Atmospheric deposition where soil gets contaminated when air pollution falls on to it, are much apparent still contributing to soil pollution. Thus, on the basis of sources of pollutants, soil pollution can be classified into the following categories:

- Agricultural Soil Pollution
- Soil pollution by industrial effluents and solid wastes
- Pollution due to urban activities

Soil pollution is caused by the presence of man-made chemicals or other alteration in the natural soil environment. This type of contamination typically arises from the rupture of underground storage tanks, application of pesticides, and percolation of contaminated surface water

### Teaching Strategy

In this lesson  
students are  
separating the  
wastes

what are soil pollution

Atmospheric deposition where soil gets contaminated when air pollution falls on to it, are much apparent still contributing to soil pollution.

Q) Soil pollutants how many types? what are they?

- soil pollution can be classified 3 types
1. Agricultural soil pollution
  2. Soil pollution due to urban activities
  3. Soil pollution by industrial effluents and solid wastes.

### T.L.M / Resources

Teaching point

to subsurface strata, oil and fuel dumping, leaching of wastes from landfills or direct discharge of industrial wastes to the soil. The most common chemicals involved are petroleum hydrocarbons, solvents, pesticides, lead and other heavy metals. The occurrence of this phenomenon is correlated with the degree of industrialization and intensities of chemical usage.

A soil pollutant is any factor which deteriorates the quality, texture and mineral content of the soil or which disturbs the biological balance of the organisms in the soil. Pollution in soil has adverse effect on plant growth and living organisms in the soil.

- Pollution in soil is associated with
- Indiscriminate use of fertilizers
  - Indiscriminate use of pesticides, insecticides and herbicides
  - Dumping of large quantities of solid waste
  - Deforestation and soil erosion

Teaching strategy

T.L.M Resources

students are learning about common chemicals involved are petroleum hydrocarbons, solvents, pesticides, lead and other heavy metals.

Q) biological balance of the soil what is effect? soil which disturbs the biological balance of the organisms in the soil its effect on plant growth and living organisms in the soil.

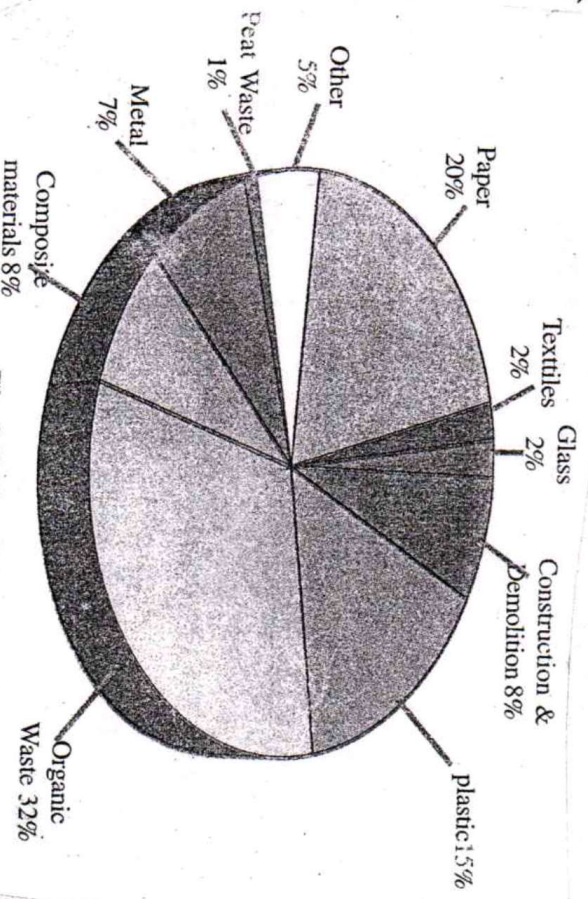


Fig-5 Soil pollutants

### Teaching Point

#### Indiscriminate use of fertilizers

Soil nutrients are important for plant growth and development. Plants obtain carbon, hydrogen and oxygen from air and water. But other necessary nutrients like nitrogen, phosphorus, potassium, calcium, magnesium, sulfur etc., must be obtained from the soil. Farmers generally use fertilizers to correct soil deficiencies.

Fertilizers contaminate the soil with impurities, which come from the raw materials used for their manufacture. Mixed fertilizers often contain nitrogen as

ammonium nitrate ( $\text{NH}_4\text{NO}_3$ ), phosphorus as  $\text{P}_2\text{O}_5$ , and potassium as  $\text{K}_2\text{O}$ . For instance, As, Pb and Cd present in traces in rock phosphate mineral get transferred to super phosphate fertilizer. Since the metals are not degradable, their accumulation in the soil above their toxic levels due to excessive use of phosphate fertilizers becomes an indestructible poison for crops.

### Teaching strategy

### T.J.M / Resources

Soil nutrients are important for plant? Plants obtain carbon, hydrogen, and oxygen air and water nitrogen, phosphorus, potassium, calcium, magnesium, sulfur must be obtained from the soil student are learning about mixed fertilizers.

The over use of NPK fertilizers reduce quantity of vegetables and crops grown on soil over the years. It also reduces the protein content of wheat, maize, grams, etc., grown on that soil. The carbohydrate quality of such crops also gets degraded. Excess potassium content in soil decreases Vitamin C and carotene content in vegetables and fruits. The vegetables and fruits grown on over fertilized soil are more prone to attacks by insects and diseases.

**Indiscriminate use of pesticides, insecticides and herbicides**

Plants on which we depend for food are under attack from insects, fungi, bacteria, viruses, rodents and other animals, and must compete with weeds for nutrients. To kill unwanted populations living in or on their crops, farmers use pesticides.

The first widespread insecticide use began at the end of World War II that included DDT (dichloro diphenyl trichloro ethane) and gamma-xene. Insects soon became resistant to DDT and as the chemical did not decompose readily, it persisted in the environment.

Since it was soluble in fat rather than

students are learning about Indiscriminate use of pesticides and herbicides

DDT means (Dichloro diphenyl trichloro ethane)

No

step

Teaching point

Teaching strategy

T.J.M

Resources

Evolution

① what are the soil involves  
common chemicals

② what are the soil pollution

③ soil erosion is one of the  
causes for soil pollution how?

④ expand DDT and BHC

# INTERNSHIP LESSON PLAN - 16

## PRELIMINARY INFORMATION

Name of the student teacher:-

Reg No -

Subject :- BIOLOGICAL SCIENCE

Class :- IX

Unit :- X - SOIL POLLUTION

Time :- 45 min

Topic :- Bio-magnification

Name of the school :- Kavya High School

Date :- 24-2-2020

comprehension & concepts during activities discussion

Teaching point

6) Biomagnification

The nutrients necessary for plant growth (e.g., nitrogen and phosphorus) are found at very low concentrations in most natural waters. In order to obtain sufficient quantities for growth, phytoplankton must collect these chemical elements from a relatively large volume of water.

In the process of collecting nutrients, phytoplankton also collects certain human-made chemicals, such as some persistent pesticides. These may be present in the water at a very low concentrations that they cannot be measured even with a very sensitive instruments. The chemicals, however, biologically accumulate (bioaccumulation) in the organism and become concentrated at levels that are much higher in the living cells than in the open water. This is especially true for persistent chemicals-substances that do not break down readily in the environment - like DDT and BHCs that are stored in fatty tissues. The small fish and zooplankton eat vast quantities of phytoplankton. In doing so, any toxic chemicals accumulated by the phytoplankton are further concentrated in the bodies of the animals that eat them. This is repeated at each step in the food chain. This process of increasing concentration

Teaching strategy

student are explained biomagnification

T.J.M Resources

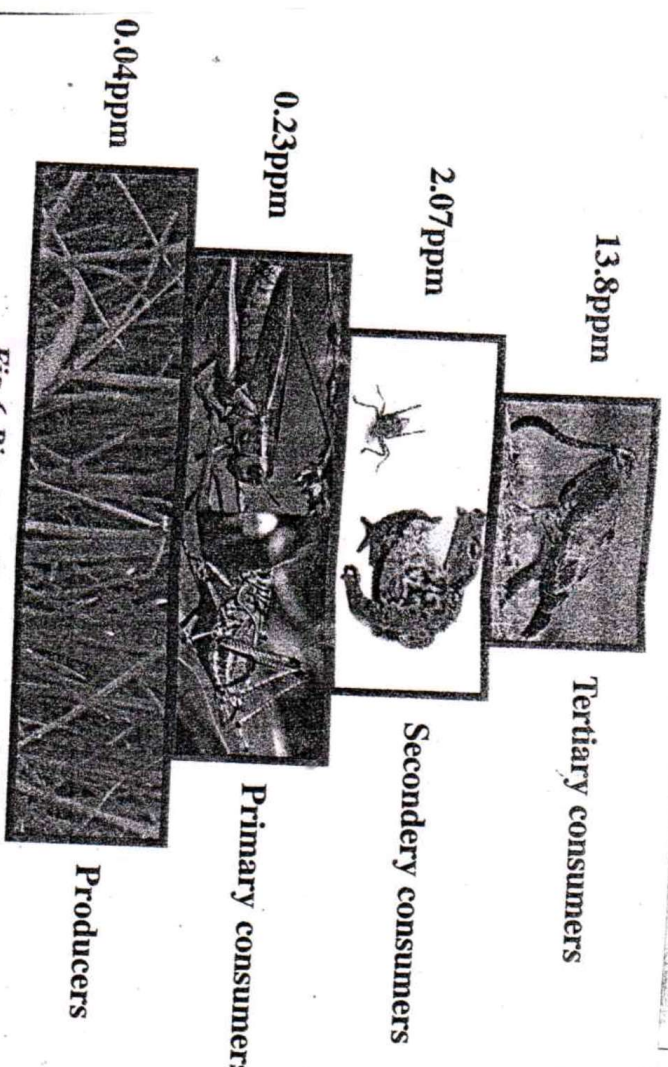


Fig-6 Bio magnification The numbers are representative values of the concentration of DDT and its derivatives (in parts per million, ppm) in the tissues.

students are explained that biomagnification sharks showing biomagnification

No	step	Teaching point	Teaching strategy	T.L.M / Resources
Evaluation			<ul style="list-style-type: none"> <li>① what is</li> <li>② bio-Magnification</li> <li>③ what is phytoplankton</li> <li>④ what is food chain</li> </ul>	

# INTERNSHIP LESSON PLAN - 17

## PRELIMINARY INFORMATION

Name of the student teacher:-

Reg No -

Subject :- BIOLOGICAL SCIENCE

Class :- X

Unit :- X - SOIL POLLUTION

Time :- 45 min

Topic :- Maintenance of wastes

Name of the school :- Kavya High School

Date :- 25-2-2020

No.	step	Teaching point	Teaching strategy	T.L.M / Resources
3.	comprehension & concepts doing activities discussion	7 <b>Dumping of solid wastes</b> The sight of a dustbin overflowing and the stench rising from it are all too familiar sights and smells of a crowded city. You look in some other direction and hold your nose as you cross it. Since the beginning, humankind has been generating waste, be it the bones and other parts of animals they slaughter for their food or the wood they cut to make their carts. With the progress of civilization, the waste generated became a more complex issue. At the end of the 19th century the industrial revolution saw the rise of the world of consumers. Not only did the air get more and more polluted but the earth itself became more polluted with the generation of non-biodegradable solid waste. The increase in population and urbanization are largely responsible for the increase in solid waste. Solid waste means any garbage, trash waste tire, sludge from a waste treatment plant, water supply treatment plant and other discarded materials, including solid, liquid, semisolid or contained gaseous materials arises from human and animal activities. In other words, solid waste may be defined as the organic and inorganic waste produced by various activities of the society which have lost their value to the	Teaching strategy Management & wastes	T.L.M / Resources students are discuss about Dumping of solid wastes

Teaching point

Solid waste, on the basis of its sources of origin can be classified as:

1. Municipal Solid Waste: It consists of household waste; construction and demolition debris, sanitation residue.
  2. Hazardous Solid Waste: industrial and hospital waste is considered to be hazardous waste as they contain toxic substances.
  3. Infectious Solid Waste: Biomedical or hospital waste generated during diagnosis treatment etc. which include sharp, chemical wastes, discarded medicines and human excreta etc.
- In general, solid waste includes garbage, domestic refuse and discarded solid materials such as those from commercial, industrial and agricultural operations. They contain increasing amounts of paper, cardboards, plastics, glass, old construction material, packaging material and toxic or otherwise hazardous substances. Since a significant amount of urban solid waste tends to be paper and food waste, the majority is recyclable or

Teaching strategy

T.L.M

Resources

what are classified as solid waste?  
→ solid waste, on the basis of its sources of origin can be classified  
They are:

1. Municipal solid waste:
2. Hazardous solid waste
3. Infectious solid waste

what are the general

solid wastes:

In general, solid waste

includes garbage, domestic refuse

and discarded solid materials

such as those from commercial,

industrial and agricultural operations

step

### Teaching point

biodegradable in landfills. Similarly, most agricultural waste is recycled and mining waste is left on site.

The portion of solid waste that is hazardous such as oils, battery metals, heavy metals from smelting industries and organic solvents are the ones we have to pay particular attention to. These can in the long run, get deposited to the soils of the surrounding area and pollute them by altering their chemical and biological properties. They also contaminate drinking water aquifer sources. More than 90% of hazardous waste is produced by chemical, petroleum and metal-related industries and small businesses such as dry cleaners and gas stations contribute as well.

Toxic chemicals leached from oozing storage drums into the soil underneath homes, causing an unusually large number of birth defects, cancers and respiratory, nervous and kidney diseases.

### Deforestation

Soil Erosion occurs when the weathered soil particles are dislodged and carried away by wind or water. Deforestation, agricultural development, temperature extremes, precipitation including acid rain, and human activities contribute to this erosion.

### Teaching strategy

T.J.M Resources

What are the diseases caused by toxic chemicals

Toxic chemicals leached from oozing storage drums into the soil underneath homes, causing an unusually large number of birth defects, cancers and respiratory nervous and kidney diseases.

What happens soil erosion?

Deforestation, agricultural development, temperature extremes, precipitation including acid rain, and human activities contribute to this erosion.

No. step

### Teaching point

cutting of timber, over cropping and overgrazing. It results in floods and cause soil erosion.  
Forests and grasslands are an excellent binding material that keeps the soil intact

and healthy. They support many habitats and ecosystems, which provide innumerable feeding pathways or food chains to all species. Their loss would threaten food chains and the survival of many species. During the past few years quite a lot of vast green land has been converted into deserts. Deforestation is slowly destroying the most productive flora and fauna areas in the world, which also form vast tracts of a very valuable sink for CO<sub>2</sub>.

### Pollution due to urbanization

#### Pollution of surface soils

Urban activities generate large quantities of city wastes including several

### Teaching strategy

Support how to keep the healthy and intact soil  
Soil keeps intact and healthy. They support many habitats and ecosystems, which provide innumerable feeding pathways or food chains to all species.

T.J.M Resources

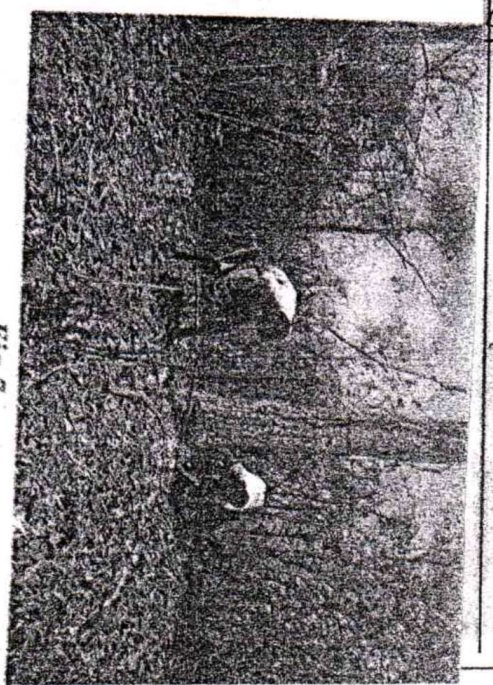
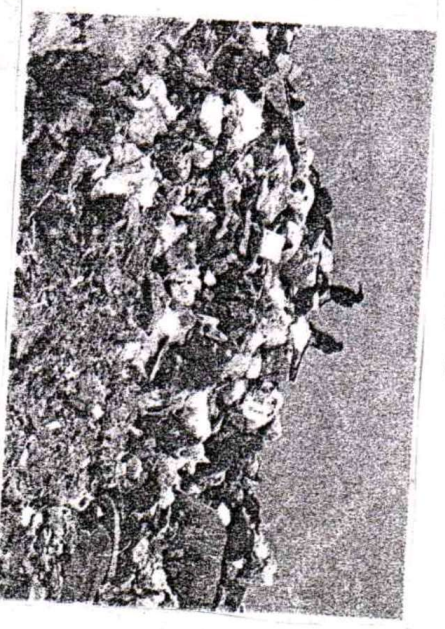


Fig-7

Part showing maintenance & costes



How to pollution of surface soils

# INTERNSHIP LESSON PLAN ÷ 18

## PRELIMINARY INFORMATION

NAME OF THE STUDENT TEACHER :-

SUBJECT :- Biological science

UNIT :-

**7. Animal behaviour**

TOPIC :- Investigating behavior

NAME OF THE SCHOOL :- Kavya High school

Regd No :-

CLASS :- IX

Time :- 45 minutes

DATE :- 26-2-2020

Academic Standards :

~~Key Concepts~~ :

1. ~~Animal behaviour~~ - An introduction.
2. ~~Different types of animal behaviour.~~
3. ~~The differences in behaviour of animals and humans.~~
4. ~~Animals - Investigating behaviour.~~

1. **Conceptual Understanding :**

The student will

1. explain about the various types of behaviour in animals.
2. give examples for the types of behaviour in animals.
3. identify the differences in behaviour between humans and animals.

II. **Asking questions and making hypothesis :**

The student will

1. enquire the reasons for the difference in behaviour of animals.
2. imagine their behaviour basing on characters and other relations.

III. **Experimentation and field-investigation :**

The student will

1. observe the "conditional" behaviour of animals (in the lab).
2. observe (pay attention to) the behaviour of animals in natural and artificial conditions.
3. learn about the investigating behaviour of animals.

IV. **Information Skills and Projects :**

The student will

1. gather information from different sources on the behaviour of various animals.
2. prepare a report on the behaviour of different types of animals in his surroundings.

V. **Communication through drawing and model making :**

The student will

1. draw the diagrams of various animals.
2. explain about the behaviour of different animals, basing on the pictures.

# Teaching Point

## Investigating behaviour

Behaviour can be investigated in the 'field' or in the laboratory. It can be observed and measured, and experiments can be designed to test how it works. Human behaviour is affected by many variables. It can be more difficult to study the behaviour of other animals.

Some scientists spend many hours watching and studying the behaviour of animals. They may be interested in how the animals live alone, group into families or form large groups such as herds.

Animals can signal to each other. For example, they may call each other to warn danger. Some scientists are interested in such signals. They record and study them to work out what the signals mean.

### Tagging

You have studied about bird migration in the chapter biodiversity and its conservation. Like birds some other animals also migrate over large distances to find food or nesting sites. Animals can be 'tagged' by attaching tracking devices to them. Tagging lets scientists follow the journeys the animals make.



The work of Lorenz and Pavlov has been mentioned in the earlier sections. These scientists studied animal behaviour under controlled conditions.

You can also study the behaviour of cockroach. For this you will need a choice box. You can make a choice box by following the given steps-

- Take a box, and divide it into four chambers with the help of a cardboard as shown in figure.
- Make tiny holes in any two chambers of one side so that light can pass through these holes into the chambers. Let other two chambers as it is (Dark).
- Now create humid environment with help of moist cotton wool in one of the lightened and one of the dark chambers.

## Teaching Strategy

\* Discussing about the things like in-  
\* vegetation in the field and tagging

## Resources

\* inference  
\* Text book

## Evaluation

\* what is investigating behaviour?  
\* what is tagging?

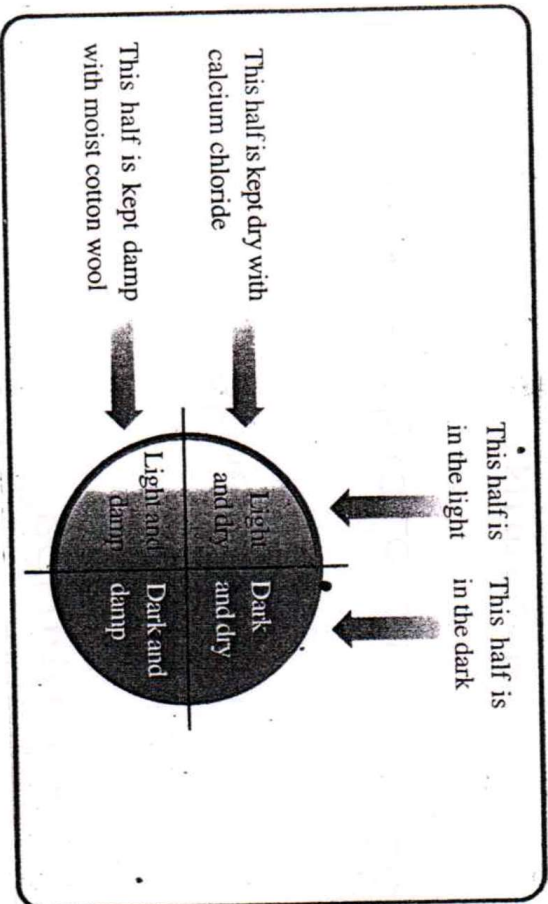
\* Lorenz and Pavlov has been mentioned in the earlier sections:

Period  
NO.

Teaching

Point

- So the box has been divided into four chambers with different conditions i.e. light and dry, light and humid, dark and dry, dark and humid. Preparations are over. Make four groups in your class. Each group will put several cockroaches into a choice of chamber with four different conditions:
  - light and dry
  - light and humid
  - dark and dry
  - dark and humid
- Cover the box and leave the setup for 15-20 minutes.
- Count the number of cockroaches in each chamber.
- In which chamber the number of cockroaches is highest?
- Compare your observations with other groups. Write down the differences if any.
- From your experiment try to write down a short note about behaviour of cockroaches regarding their living conditions.



Teaching Strategy

Resources

Evaluation

Activity  
Observation.

Test  
book.

\* what is  
Tagging

# INTERNSHIP LESSON PLAN - 19

## PRELIMINARY INFORMATION

Name of the student teacher :-

Reg No -

Subject :- BIOLOGICAL SCIENCE

Class :- IX

Unit :- 7 - ANIMAL BEHAVIOUR

Time :- 45 min

Topic :- Behaviour of humans

Name of the school :- Kavya High School

Date :- 27-2-2020

# Teaching Point

## Human behaviour

Humans show same types of behaviour as other animals. But human behaviour is often more complex because we are more intelligent and aware of ourselves.

## Imitation

Imitation is a type of behaviour where one animal copies another animal. Humans often imitate each other, often without realising it. When people talk to each other, they may stand or sit in a similar way, and copy each other's movements. Scientists think that this happens so that the speakers feel more at ease with other.

Some scientists think that humans are the only animals that copy each other. Other scientists have observed chimpanzees and other primates imitating each other. For example, chimpanzees can use sticks to spear juicy grubs to eat. Other chimpanzees copy this behaviour. In this way they learn new skills. Do you ever heard monkey imitate us. Read and discuss about the story 'Monkey and Hat merchant'.

## Instinct

Humans have instincts, but it is possible for us to overcome natural urges to follow certain behaviour. For example, hungry persons might start eating immediately when they sit down at the dining table, but they have learned that good manners means they should wait until everyone is seated and ready to eat.

# Teaching Strategy

\* Instinct, conditioning and imitation in human beings

Discussion about instinct

# Resources

\* Observation  
\* Hypothesis

Text book

# Evaluation

\* How many types of behaviour is in humans?

Period No	Teaching Point	Teaching Strategy	Resources	Evaluation
	<p>Imitation</p> <p>People often imitate each other. This can help them learn something new and useful, such as new skill in lessons, sport or at work. It can also lead them to show less useful or harmful behaviour. For example, young people may start smoking, drinking alcohol or taking drugs as a result of copying each other to 'fit in'. But it is very dangerous to our health.</p> <p>Conditioning</p> <p>Conditioning can be used to change the behaviour of people. Advertisers are very skilled at this. They use pictures of their products which make them look glamorous or exciting, often by using famous actors or sports people. By associating the product with attractive images the advertisers are trying to set up a conditioned response to their product. People will respond positively and buy the product.</p>	<p>Discussing about Imitation.</p>	<p>* Observation</p>	<p>* How can bring a change in a man through conditioning?</p>

# INTERNSHIP LESSON PLAN - 20

## PRELIMINARY INFORMATION

Name of the student teacher:-

Reg No -

Subject :- BIOLOGICAL SCIENCE

Class :- IX

Unit :- 7 - ANIMAL BEHAVIOUR

Time :- 45 min

Topic :- Animal behaviour

Name of the school :- Kavya High School

Date :- 28-2-2020

# Teaching Point

In this lesson we will try to understand about why animals behave in a specific way. Is there any pattern in their behaviour? What are the factors that affect their behaviour?

## What do we mean by Animal Behaviour?

Animal Behaviour is the scientific study of the wild and wonderful ways in which animals interact with each other, with other living beings, and with the environment. It explores how animals relate to their physical environment as well as to other organisms and includes topics such as how animals find and defend resources, avoid predators, choose mates, reproduce, and care for their young.



Fig-2 Weaver bird

# Teaching Strategy

\* Discussing about the meaning of animal behaviour.

\* Picture showing the behaviour of animals

# Resources

\* Discussion  
Explanation

\* Picture showing the behaviour of animals



Fig-1 (a) Butterfly on Pleseer

# Evaluation

\* Which factors influence the behaviour of animals?

Period No	Teaching Point	Teaching Strategy	Resource	Evaluation:
	<p>The study of animal behaviour begins with understanding how an animal's Physiology and Anatomy are integrated with its behaviour. Both external and internal stimuli prompt behaviours external information (For example threats from other animals, sounds, smells) or weather and internal information (For Example hunger, fear). Scientists are drawn to the study of animal behaviour for varied reasons and the field is extremely broad, ranging from research on feeding behaviour and habitat selection to mating behaviour and social organizations.</p>	<p>* Making the Students enact the behaviour of different animals</p>	<p>DISCUSSION OBSERVATION</p>	