ENVIRONMENTAL STUDIES

AGRICULTURE

Teacher's Book Year two

LEARNING TO CULTIVATE OUR LAND

DEVELOPED JOINTLY BY:
THE MINISTRY OF EDUCATION,
HEALTH,
AGRICULTURE
AND UNICEF.

CURRICULUM DEVELOPMENT CENTRE OF VANUATU

ENVIRONMENTAL STUDIES

GENERAL AIMS

To help each child to develop all his skills (physical, intellectual, emotional and social) so that, as an adult, he can:

- Participate in society
- Take part in the economy
- Take part in politics
- Communicate
- Adapt to differing or changing environments

These aims go beyond the school context and are the result of three types of general objectives :

1. Knowledge (knowledge - connected objectives)
2. Skills (methodological objectives)
3. Constructive behaviour (behavioural objectives)

KNOWLEDGE + SKILLS + CONSTRUCTIVE BEHAVIOUR = GOOD DEVELOPMENT

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WHY TEACH HEALTH, NUTRITION AND AGRICULTURE AS PART OF THE PRIMARY EDUCATION CURRICULUM ?

Health is a fundamental human right for everyone and Vanuatu is officially committed to developing a policy of Primary Health Care aimed at bringing good health by the year 2000 to the whole world, including Vanuatu.

This policy hopes to involve the entire population of this country in the decisions and activities required to improve the health of each individual, each family and each community.

Children, who are the citizens of tomorrow, must be taught to take responsibility for their own health and for that of people close to them. School is the best place to provide this education, which should be undertaken by teachers in collaboration with pupils' parents and with health and agriculture specialists.

Also, in Vanuatu the health of children of school age is threatened by diseases which could be prevented by effective education. These deseases, in order of importance, are : scabies and other skin infections, malaria, respiratory infections, diarrhoea in association with inadequate weight (thin children), eye infections (conjunctivitis) and ear infections (otitis).

This is why the teaching of health and the two other subjects associated with it, nutrition and agriculture, will from now on form part of the schools curriculum.

<u>The aims of this programme are</u> :

1) To encourage children to acquire healthy habits .

2) To develop a desire in children to be healthy and to eat properly and to develop a respect for all kinds of animal and vegetable life.

3) To develop knowledge of the human body, understanding of the various factors involved in good health and disease, knowledge of local foods with high nutritional value and knowledge of family cultivation and stock rearing methods.

4) To help children to acquire technical abilities which will assist in improving health, nutrition, gardening and stock rearing at the family and community levels.

GENERAL INTRODUCTION

Agriculture is the principal activity in this country.

It must therefore be promoted within the framework of school education in order to re-awaken in ni-Vanuatu children the idea and the practice of cultivating their land and so as not to dissociate basic school activities from cultivation of the earth.

By providing knowledge and advice on agriculture, on the creation and development of a school garden, these booklets will help teachers to achieve this aim.

WHAT IS REQUIRED TO PRODUCE A GOOD AGRICULTURE SYLLABUS

Agriculture is the most important industry in Vanuatu. If the country is to prosper, cultivators too must prosper. The future of the country depends on better cultivators producing more and providing better food, better health and better income. In order to achieve this, schoolchildren must learn the basics of improved agriculture. At primary school level, teachers should concentrate their teaching on the three following points :

The environment: Pupils must appreciate that agriculture is a biological system as well as a manipulation of the environment. Good agriculture means improving the environment and, as a result, providing a constant supply of foodstuffs. Poor cultivation results in the destruction of the environment and no production of food.

Efforts should be concentrated on the three following points :

- Soil - how to use it, how to improve it, how to prevent erosion.
- Water - why is it necessary, how to save it. how to keep it clean.
- Air and sun - why they are necessary.

Production for family consumption: Pupils must associate the lessons on agriculture with those on nutrition ; they must understand that a better diet means better health and that all this depends on their ability to produce good food. They should concentrate on the following points :

- Choosing suitable crops
- Planning annual crop rotations
- Using the products
- Improving the soil
- Planning livestock

Production for sale: Pupils must understand that they will have to live on the produce of their land. They will have to sell some of their products to earn money. In this regard they should concentrate on the following points :

- Choosing products which will earn money in their region.
- Balancing the use of the land, with gardens taking priority.
- Finding markets.
- Maintaining or increasing production.

In reality we can only hope that pupils will understand that agriculture is living biology and we should try to guide them towards sources of information which they will be able to use later in life.

GENERAL PRESENTATION

Following on from Year One at Primary School, the teacher will endeavour during Year Two to develop the children's interest in agriculture.

This discipline, which is being re-introduced into primary schools, is vital for the individual and for Vanuatu.

Let us begin our preparations for the future in the primary schools.

YEAR TWO AGRICULTURE

The aims of this second year of the elementary school agriculture syllabus are based on two main themes :

- Plants
- Animals

Through this teaching we are going to look at the growth and classification of plants in a very simple way.

As in Year One, it is a matter of allowing pupils to make discoveries, of making them aware of the importance of the land in agriculture.

This is closely linked to the health and nutrition programmes.

Better agriculture means better nutrition and better health.

YEAR TWO AGRICULTURE

CONTENTS

b) Studying animals

23) Rearing animals in class or in the school
24) Story: "The Four Little Mice"
25) The different parts of a cow
26) Animals: external appearance: feathers, fur.
27) Story: "How the Flying Fox got its Wings".
28) Animals' needs - animal care.
29) Animal movements
30) Wild animals - domestic animals

C FISH

31) Living by the sea shore
32) In the river - in the sea
33) Fishing stories
34) Fish: external appearance: scales
35) Story: "The Little Blue Fish".

D ASSESSMENT

36) Assessment

YEAR TWO AGRICULTURE

ANNUAL TIMETBLE

TERM / WEEK	TERM 1	TERM 2	TERM 3
1	1	13	25
2	2	14	26
3	3	15	27
4	4	16	28
5	5	17	29
6	6	18	30
7	7	19	31
8	8	20	32
9	9	21	33
10	10	22	34
11	11	23	35
12	12	24	36

LESSON 1

TITLE: Plants: presentation around the school

AIMS: The teacher should help the pupils to discover plants growing around the school.

DURATION: Variable: 25 minutes if the teacher stays in class; indefinite if the teacher organises a trip around the school.

MATERIALS: None.

ACTIVITIES: In class or visit.

Remarks: As in Year One, the pupils learn the language of education through discovery of the animal and vegetable world.
They learn to look, to observe, to name.
They develop their memories, their knowledge.

IN CLASS

Group work in the form of questions and answers.

The teacher may ask about what was studied in Year One agriculture.

As in Year One, and throughout school, the teacher encourages correct replies and praises success.

The teacher gets the whole class to repeat correct answers.

The questions are broad and cover the animal and vegetable world and what was studied during the previous year.

The teacher asks simple questions and, as the year progresses, he uses the lessons to ask more difficult questions.

Then the teacher displays the Lesson 1 drawing and gets the pupils to describe it.

Pupils should put up their hands to answer individually.

Correct replies may be written on the blackboard :

the names of trees
the names of plants
the names of fruits
the names of flowers

The pupils read the names written on the blackboard.

The teacher may ask questions of individual pupils in order to assess knowledge acquisition.

All these teaching notes are applicable to all lessons

VISIT

The teacher takes the pupils on a short trip around the school.

The teacher repeats the questions asked in Lesson 1 of Year One agriculture :

- "What is our country called?"
- "What is our island called?"
- "Do you know any other islands?"
- "What is our village called?"
-)"Do you know any other villages?"

Then the teacher asks the pupils to describe what they can see around the school.

The names of plants
The names of flowers
The names of fruits
The names of trees.

Correct replies are repeated by the whole class and the teacher points to the plant and says its name.

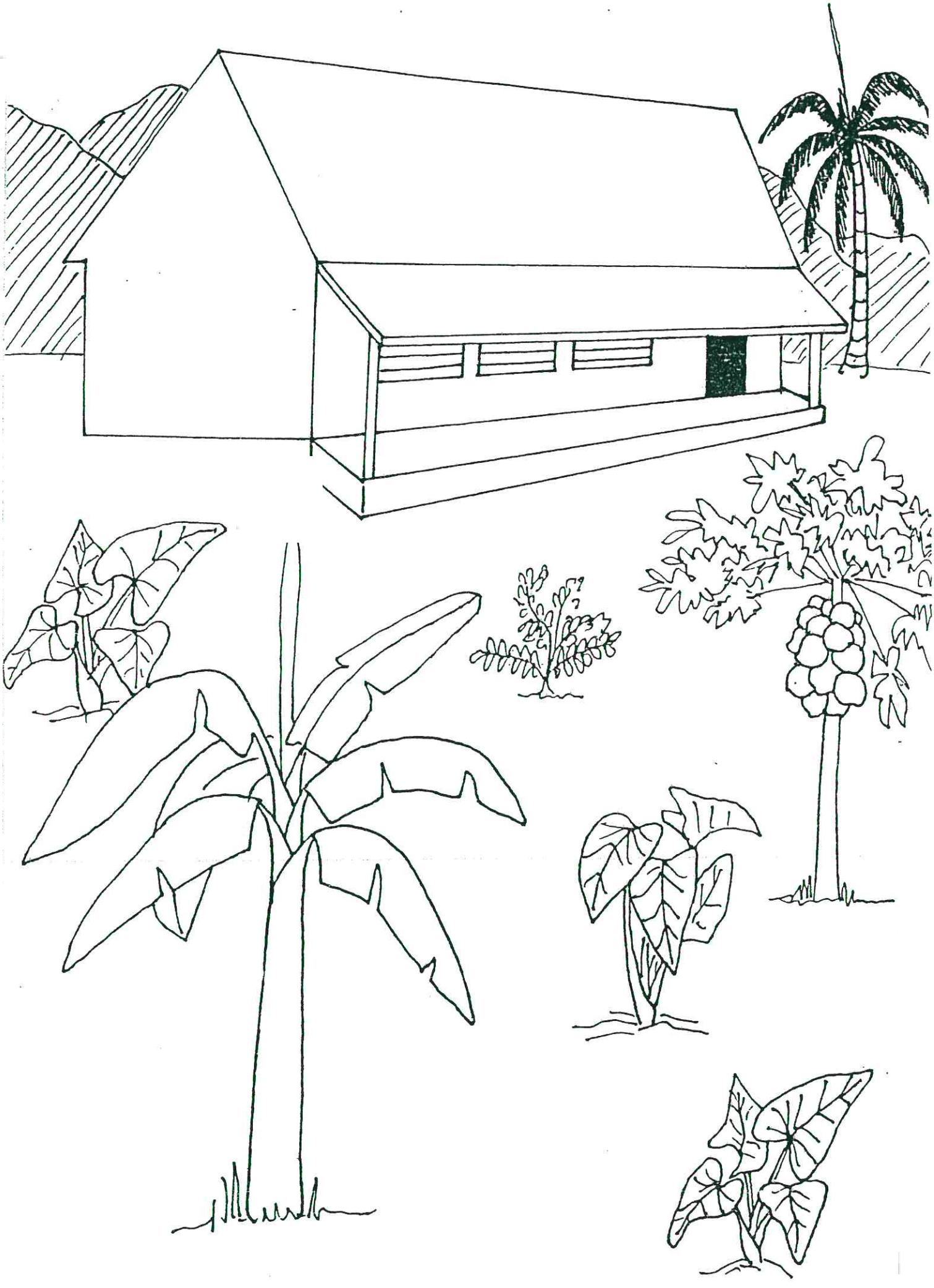
The teacher may ask the pupils if they know any other plants, fruits, flowers or trees.

This lesson restores contact with agriculture, plants and the land. It is oral only.

CONTINUATION with drawing activities.

The teacher may, if he wishes, get the pupils to produce drawings of plants around the school.

The best drawings could be pinned up on the wall with labels showing the names of the plants.



LESSON 2

TITLE : The school garden

AIMS : Presentation of the school garden to pupils, visit to discover this home market, the result of WORK and NATURE.

DURATION : 25 minutes.

MATERIALS : None.

ACTIVITIES : Before the visit, or if the teacher does not have a school garden near the school, the teacher shows the lesson drawing to the pupils.

The pupils gather round the teacher.
The teacher shows the drawing.
The teacher asks the whole class questions.
The pupils put up their hads to answer.
T - "What can we see in the drawing?"
P1, P2, P3 .....

The teacher tries to get the pupils to name the various parts of the drawing.

The teacher will extend the questioning if a visit is not possible.

If there is a school garden near the school, the presentation of the drawing will last only a short time.

VISIT TO THE SCHOOL GARDEN

The teacher takes the class to discover the garden. Each different plant and vegetable should be named and displayed.

The pupils say each new word together.

The teacher questions the pupils individually in order to check on knowledge acquisition.

We shall not list the names of garden plants and vegetables here, since this depends on the particular school garden.

LESSON 3

TITRE : Germinating, germination.

AIMS : To help the pupils to discover germination.

DURATION : Experiments and observations spread over several weeks.

MATERIALS : Beans, cotton wool, a little soil, some small containers (used boxes, pots, etc.)

ACTIVITIES :

1st phase (possibly several sessions):
Preparation of experiments: the teacher and the pupils put some beans in pots, then they add a little soil.

If the teacher has any cotton wool, the beans should be put in damp cotton wool first and then the whole lot should be put in the container.

These beans should be watered a little each day. The teacher and pupils make the same preparations outside. The soil should be turned over and the beans put in the earth and covered with about 1 cm of soil, then they should be watered.

The places where the beans are located should be marked.

The pupils could go and look at the development of the beans each day during break.

This planting should be done in the school garden.

The pupils can also observe germination in class.

The beans in the classroom will germinate more quickly.

Summary of observations

The teacher shows the drawings to the pupils gathered around him.

T - "What can we see in drawing I?"
T - "What can we see in drawing II?"
T - "What can we see in drawing III?"
T - "What can we see in drawing IV?"
T - "What can we see in drawing V?"

Correct answers are repeated by the whole class.

The teacher writes correct answers on the blackboard.

The teacher attempts to get the pupils to discover and learn the following system; it should be copied into agriculture exercise books.

SEED --- GERMINATION --- ROOTS --- PLANTS:

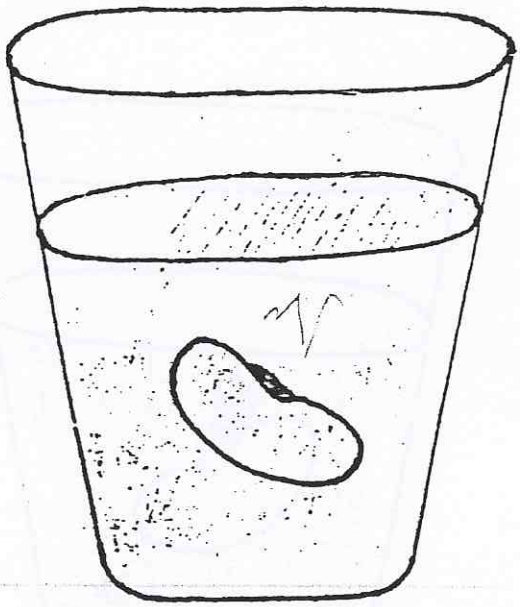
LEAVES --- FLOWERS --- FRUIT

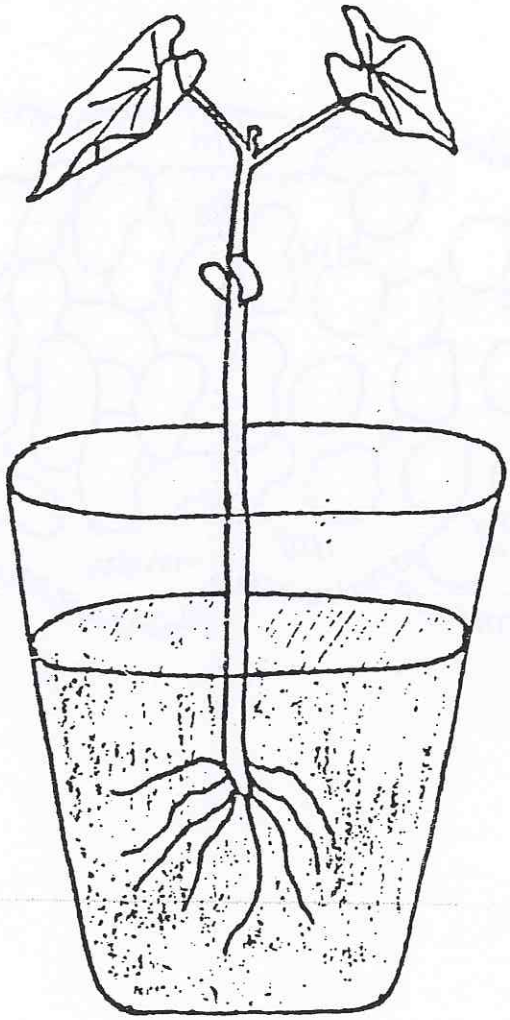
Remarks : the pupils have agriculture exercise books in which they make short summaries and draw little pictures. They may take this exercise book with them when the join later classes and add to their knowledge of agriculture.

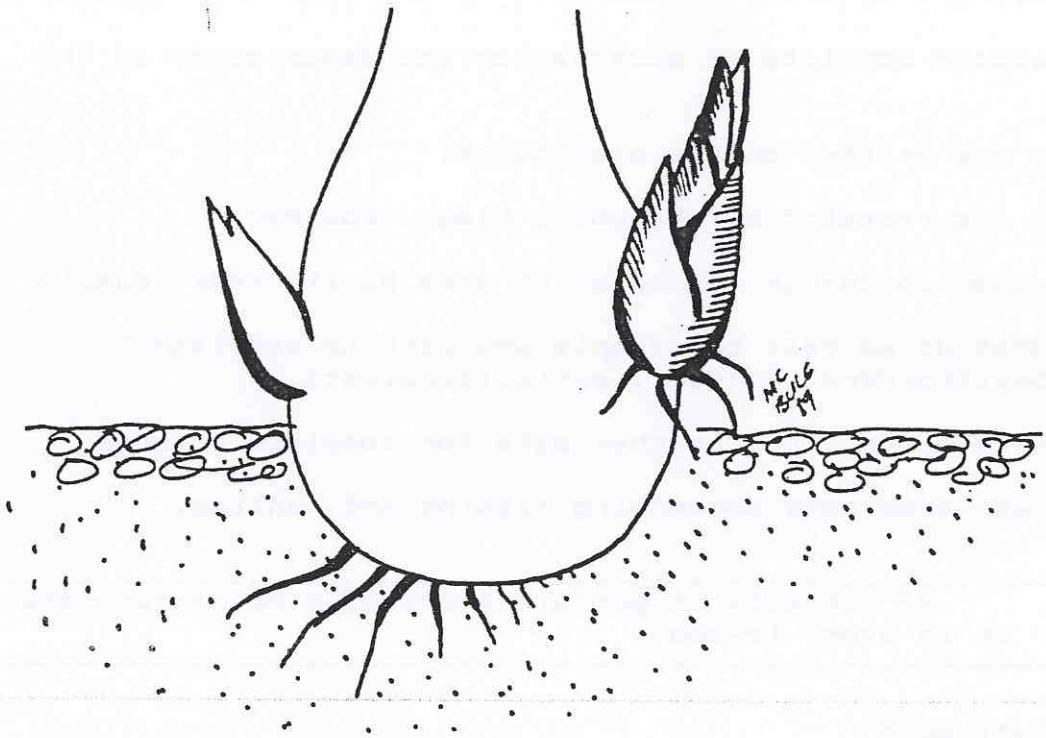
Continuation with drawing activities

The pupils may copy drawing No. III, which the teacher has drawn on the blackboard, into their exercise books.

I







LESSON 4

TITLE : Livelihood: work

AIMS : To discover the "world of work". Man's activities which provide his livelihood.

DURATION : 25 minutes

MATERIALS : None

ACTIVITIES :

GROUP WORK

The teacher gathers the pupils around him to show them drawings I, II and III.

This lesson consists of observation and description of the drawings.

Answers are written on the blackboard.

Answers are repeated by the whole class together.

The teacher in charge may question some pupils individually:

T - "What do we call the people who work on the land?"
P1 - "Smallholders, farmers, agriculturalists."

With the drawings, the teacher asks for complete answers.

He may ask questions concerning fishing and hunting.

He attempts to get all the pupils to participate, as in every lesson

Individual work

Summary to be copied into exercise books.

I. Work on the land: cultivation, gardening, smallholders, farmers, agriculturalists.

II. 1) Woodworking: joiner, carpenter, sculptor
2) Schoolteacher
3) Meal, break.

III. 1) Work on the land: crops, food
2) Fishing: fisherman, fish
3) Hunting: hunter, prey.

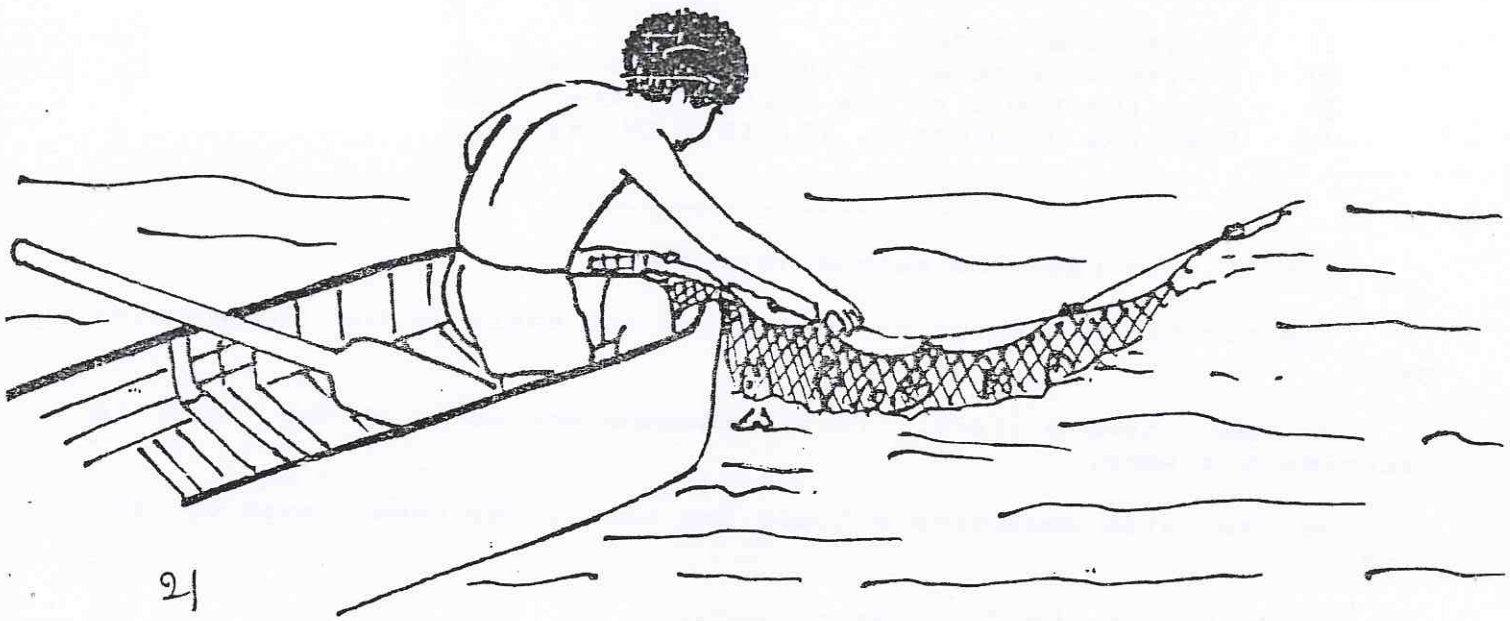
II

1)

2)

3)

1)



2)

3)

LESSON 5

TITLE: Gardening : presentation

AIMS: To discover gardening through tools, experiments, stories.

DURATION: 25 minutes (one could have several sessions if one visited a garden or invited a gardener or a farmer into the class to talk about gardering).

MATERIALS : Ask the pupils to bring garden tools to the class. One could use the school's.

ACTIVITIES : There are several possibilities :

1) Visit to a garden
2) Invite a gardener to the class to talk about gardening
3) Show the tools to the pupils in the classroom.
4) Describe drawings I, II, III, IV and V.

The teacher uses the method he prefers.

The teacher organises his lesson on the basis of the suggestions made.

He may have a visit, invite someone who works on the land to describe his work.

He may also demonstrate tools and how to use them: even by miming.

He describes the drawings :

Each time, name the object or drawing ; correct answers should be repeated by the whole class.

The activity should take the form of questions and answers in order to get the pupils to participate orally as much as possible.

Individual work

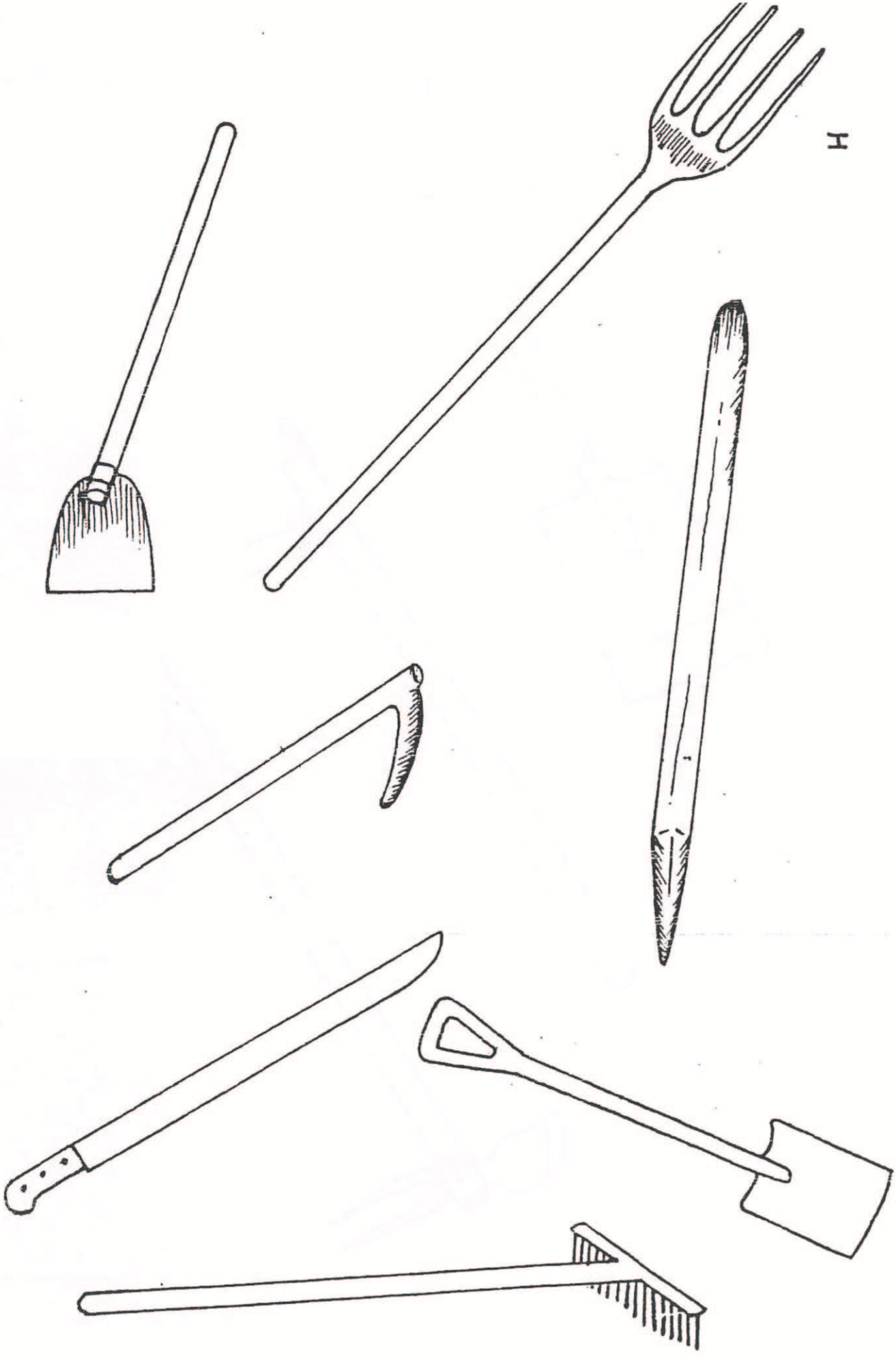
Summary to be copied into agriculture exercise books.

The main tools for gardening are bush-knives, rakes, picks, shovels, spades, dibbers, buckets, wheelbarrows.

The main elements of gardening are :

Preparation, weeding the land (removing grass and weeds).

Sowing seeds, watering, tending, harvesting.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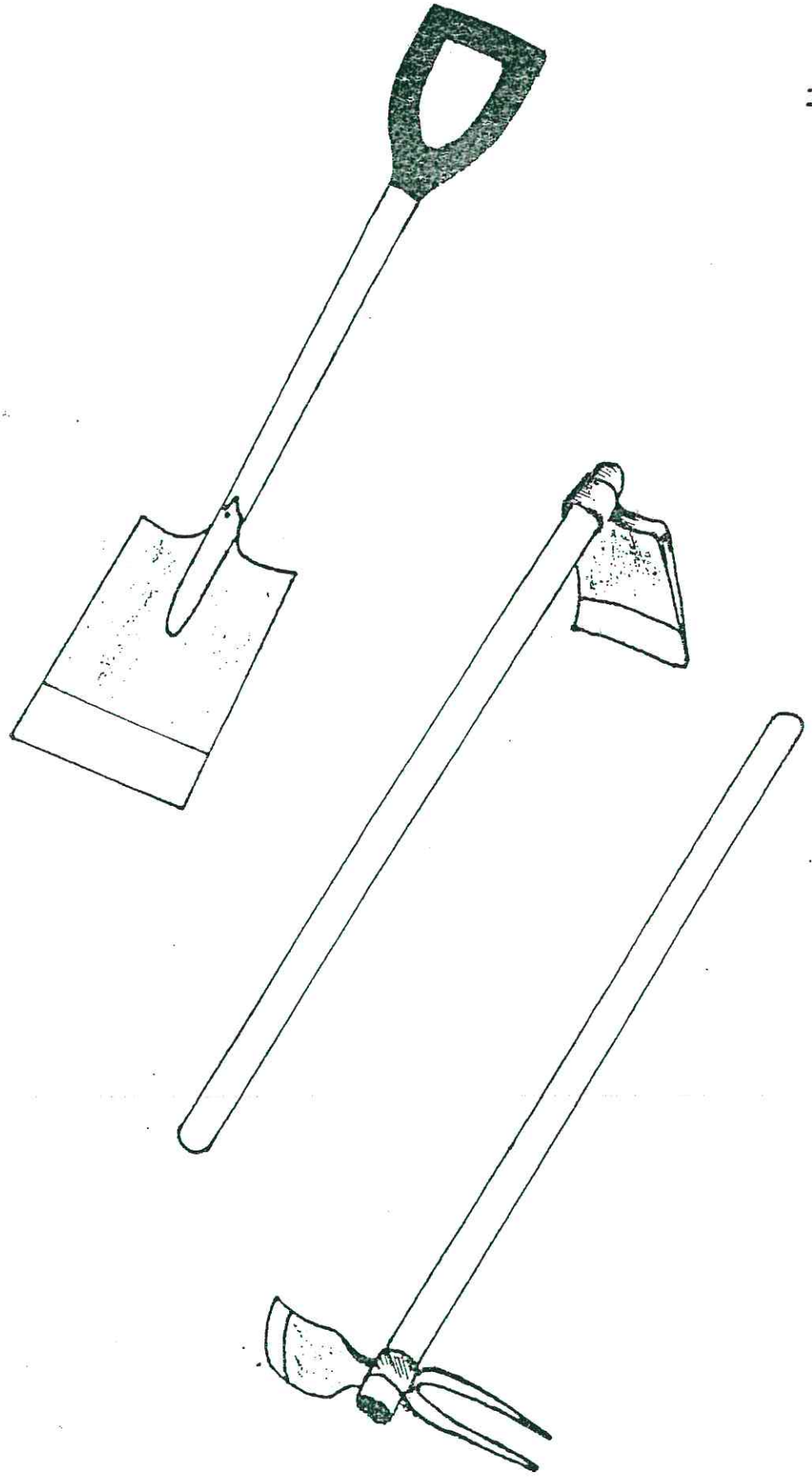

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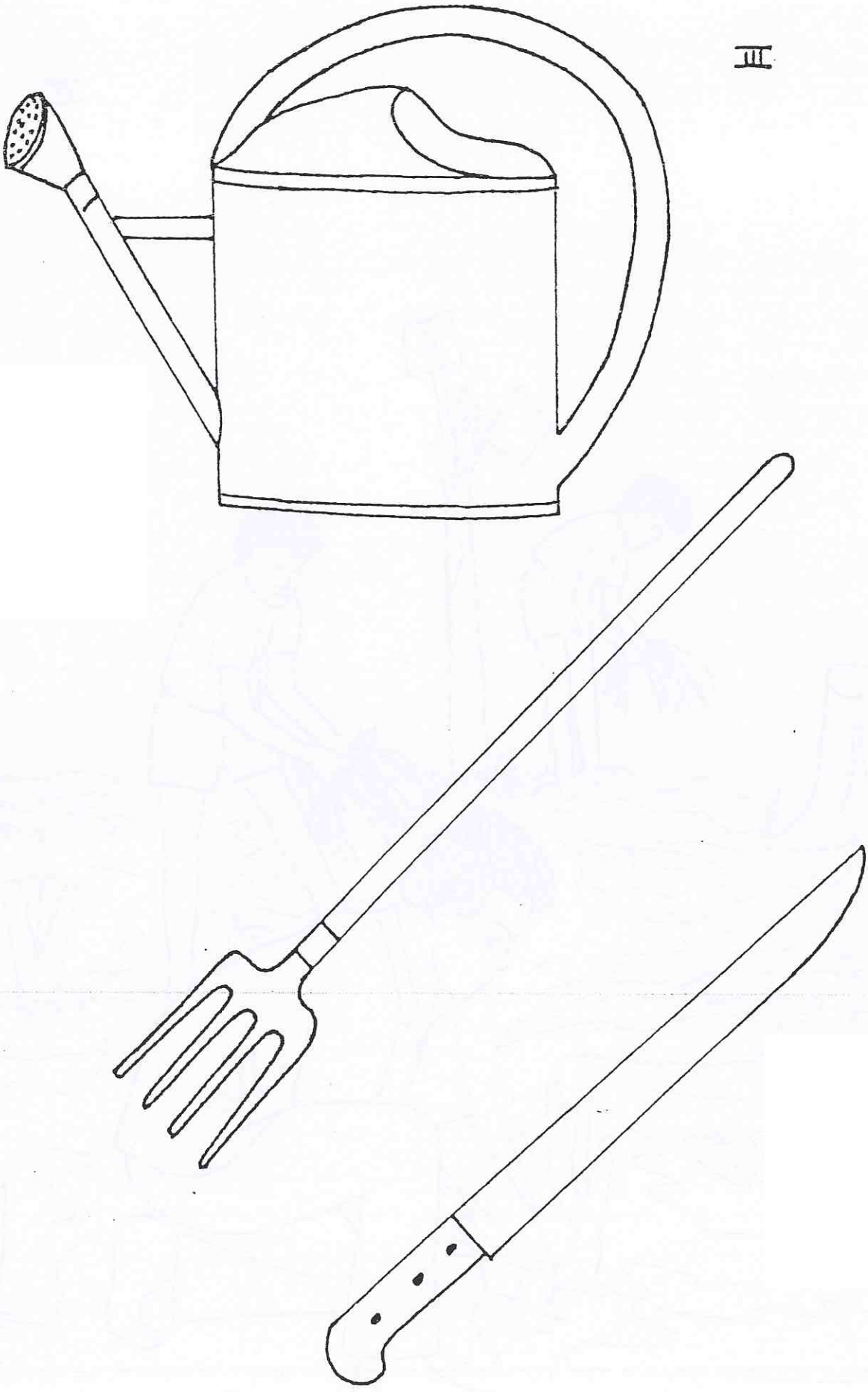
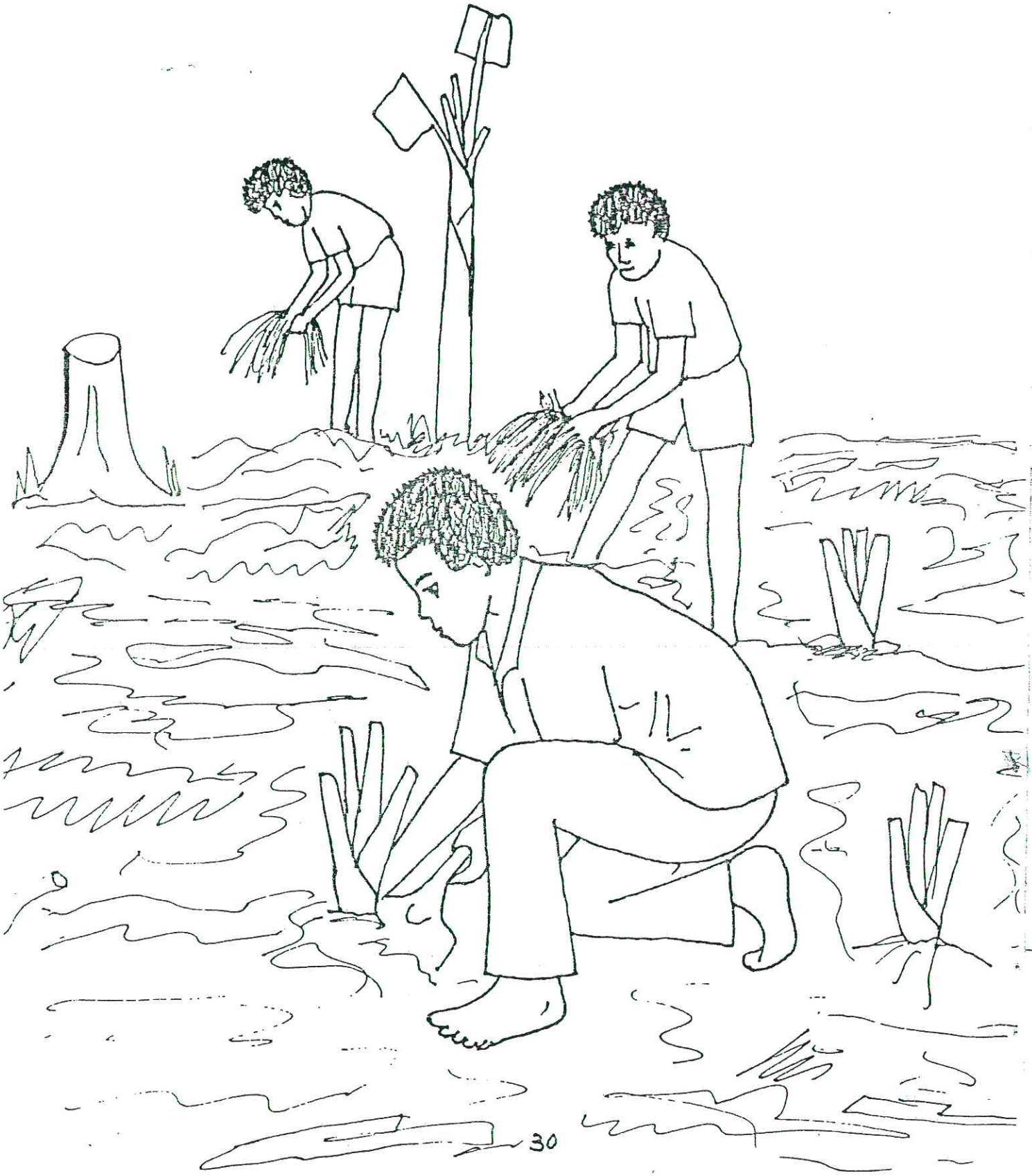


IV



LESSON 6

TITLE : Growth : transformation of plants.

AIMS : To discover the transformation of plants by observing them around the school, in the school garden and by describing the drawings attached to Lesson 6 : I - IV.

DURATION : 2 sessions of 20 minutes each
20 minutes : visit and observations
20 minutes : description of drawings.

MATERIALS : None

ACTIVITIES :

Visit and observations around the school

The teacher takes the class on a short visit to see the plants growing around the school.

The teacher tries to point out the same type of plants at different stages of development.

e.g. a taro)
) 1 small, 1 medium, 1 large
a banana)

Ask the children
- "What can you see?"
- "What are the flowers like?"
- "Can you see any roots?"
- "Can you see any fruit?"
- "Can you see any flowers?"

With each answer, point out where the various parts are located.

- "This is a stem."
- "These are leaves."
- "These are roots."
- "These are flowers."
- "This is fruit."

The pupils repeat the answers.

You could ask some pupils to say the names of parts of plants and to point to them.

Ask other pupils whether the answers are correct.

Organise it as follows :

1st plant: the small one
2nd plant: the medium one
3rd plant: the large one

Compare the size of the plants.

- "Which is the biggest?"
- "Which is the smallest?"

Also compare the various parts of the plants.

Description of drawings I, II, III, IV and V

The teacher asks the pupils gathered round him what is shown in drawings I, II, III and IV.

Remind them of the plantings done in class.

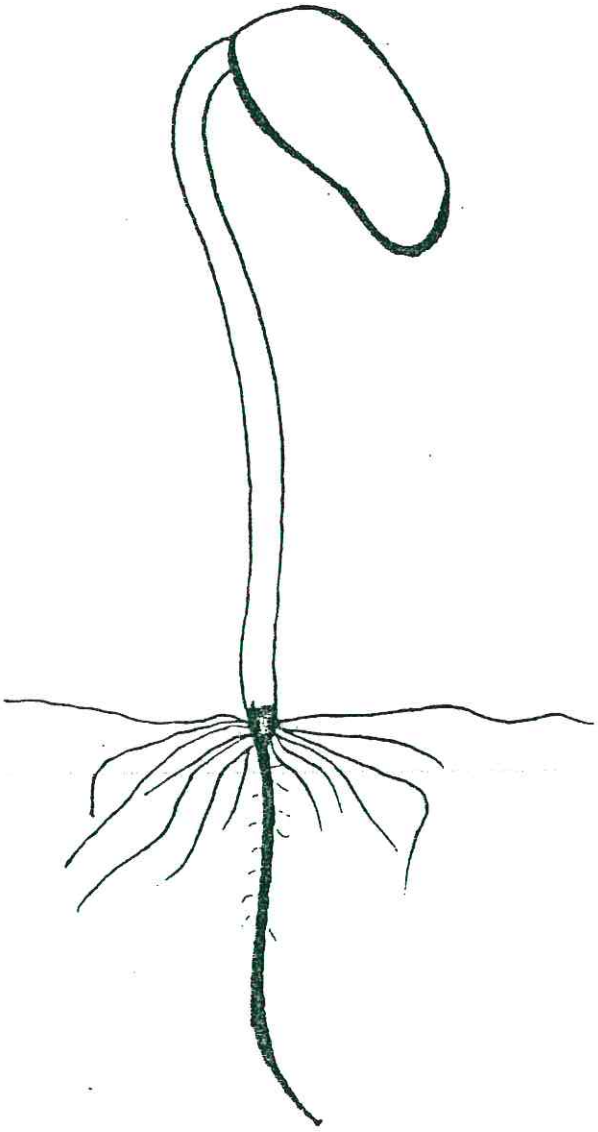
T - "What is happening in drawings I, II, III an IV?"

Summary to be copied

Plants germinate, develop, grow -
they are transformed.
Just like children, plants grow.
They grow leaves, flowers, fruit.
Each plant has an adult size - its maximum size.

Drawings I - IV: development of the bean.
Drawing V : 3 stages of the development of the taro.

(I)



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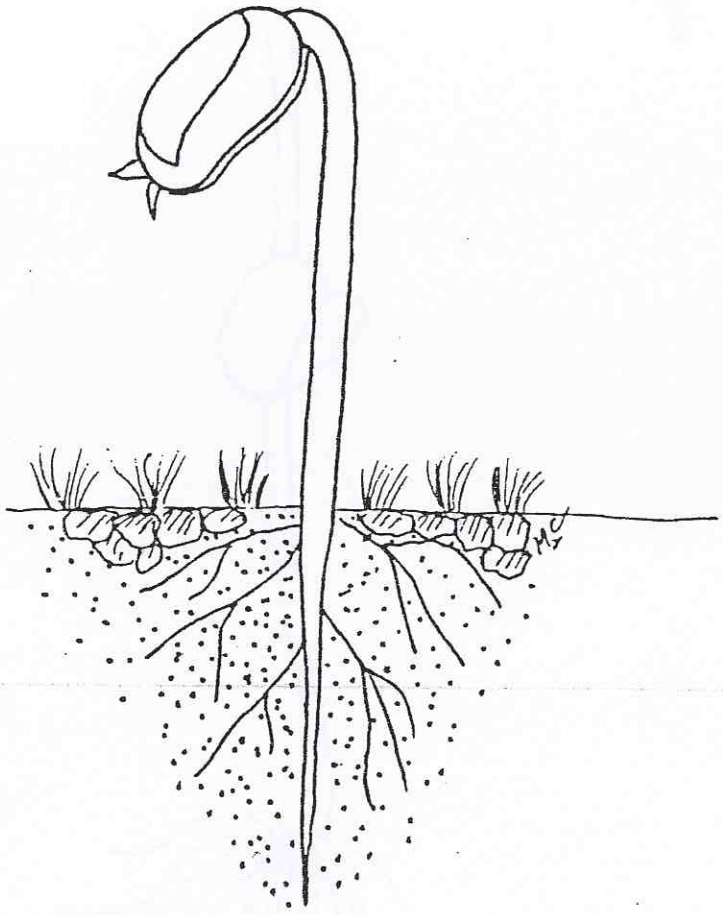

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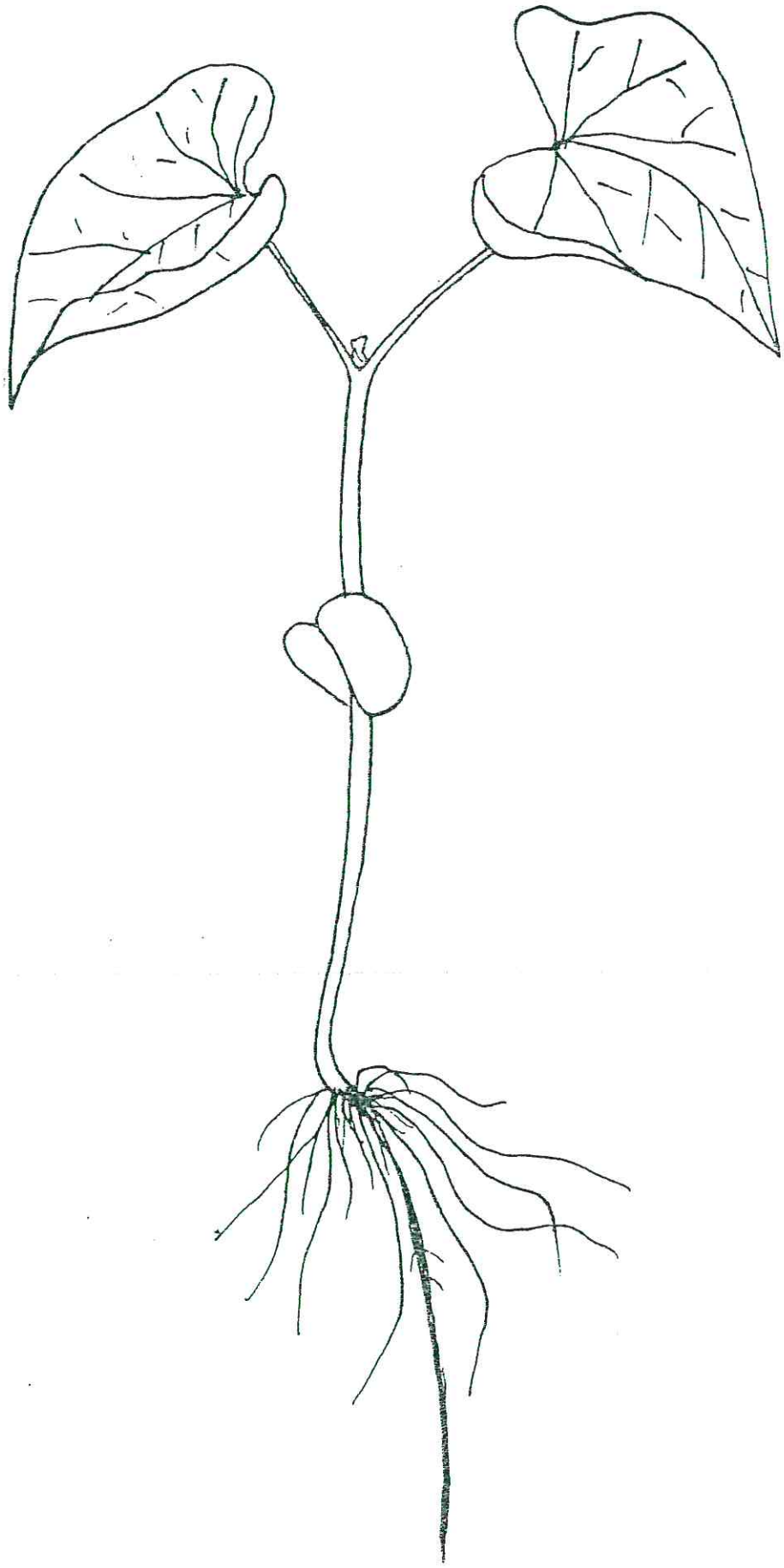



IV

V

LESSON 7

TITLE: The different parts of the taro.

AIMS: To discover the different parts of a familiar, nutritious plant: the taro.

DURATION: 25 minutes.

TERIALS: Bring a taro into class (with the leaves on).

CTIVITIES:

GROUP PHASE

The teacher presents a taro to the pupils.

T - "What is this?"
P1 - "It is a taro."

The answer is repeated by the whole class.
T - "What are the different parts?"

The teacher should get the pupils to find the names of the diffe-ent parts.

1) roots
2) stems
3) leaves

The teacher helps the pupils with the roots because the taro is a uber with fibres which draw nutrients from the soil to enable the lant to develop. The tuber, which is the edible part, is underground.

The taro is a food.

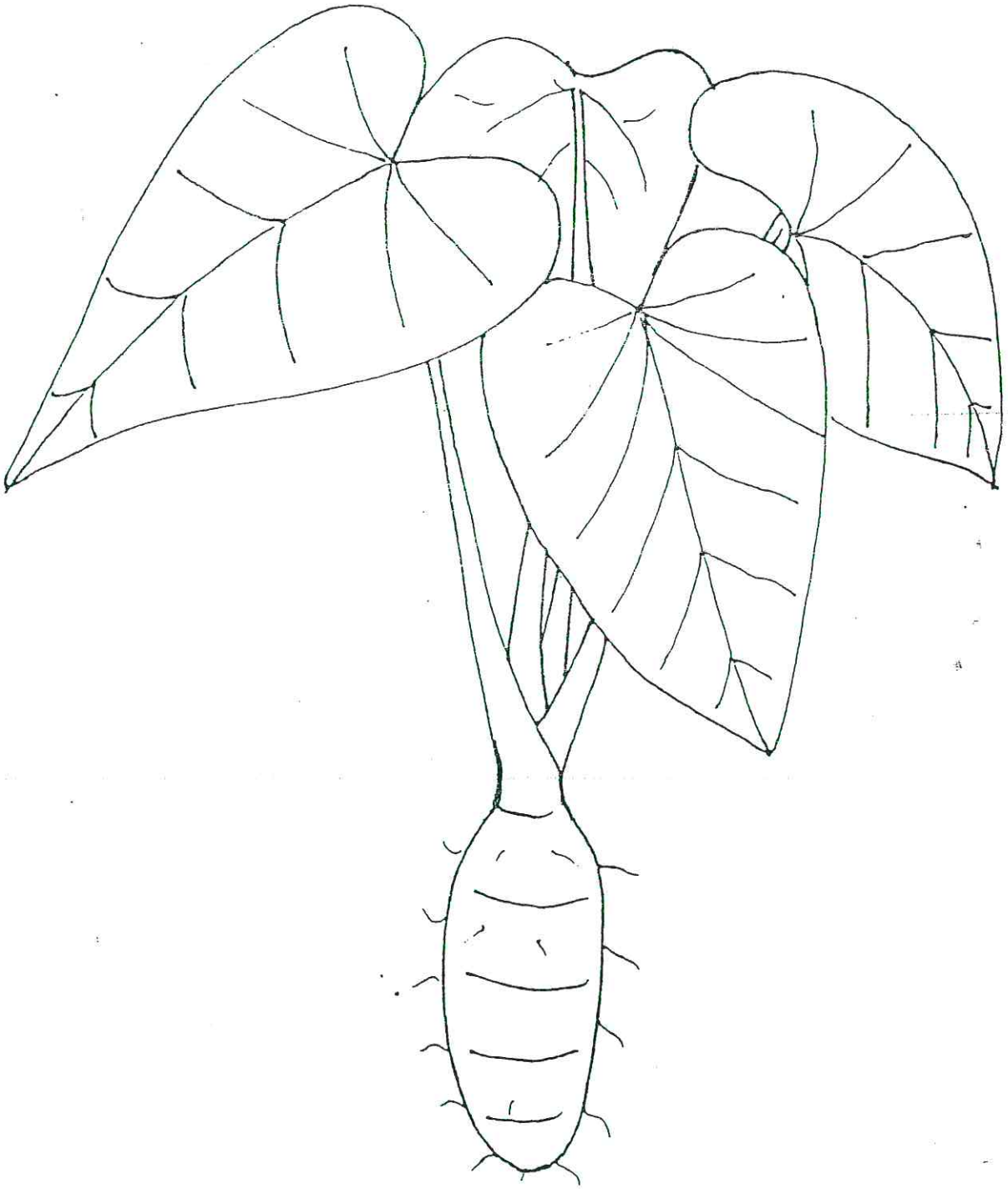
There are two types of taro in Vanuatu. If the teacher can, he ould try to present the two types of taro to the pupils.

Pupils come out to indicate and name the different parts of the ro to the class.

Answers are repeated by the whole class. This exercise serves as test.

For this lesson the teacher does not make a summary to be copied to the agriculture exercise books. He simply gives the vocabulary, neral information and knowledge about the function of the taro ood).

The teacher then describes the Lesson 7 drawing.



TITLE: Drawing a taro.

AIMS: To administer a test: following the lesson on the different parts of the taro, the teacher tries to see if the pupils have assimilated Lesson 7.

DURATION: Indefinite.

MATERIALS: None.

ACTIVITIES:

The teacher may or may not present a taro to the pupils.

He could put on the board a drawing, a photograph, an image of a taro.

The pupils draw it on paper or cardboard, according to what materials the teacher has available to him.

Look at the results and get the pupils to compare them.

You could put them up in the classroom with the label TARO.

LESSON 9

TITLE: The different parts of a tree
Drawing a coconut palm.

AIMS: To discover the different parts of the coconut palm. To name the different parts of the coconut palm. The role of the coconut palm: simple ideas.

DURATION: 30 minutes.

MATERIALS: None.

ACTIVITIES:

GROUP PHASE

This is oral work.

By using the method of questions and answers, the teacher guides and organises the pupils' replies.

T - "What are the different parts of the coconut palm?"
"What are the different parts called?"

Correct answers are repeated by the whole class.

The teacher draws coconut tree on the blackboard and indicates each part on the blackboard, naming each one once the answer has been given.

Then the teacher gathers the pupils round him and shows the drawing of the coconut palm.

The parts are again indicated and named.

Then the teacher asks questions about the role of the coconut palm.

Correct replies are repeated.

INDIVIDUAL PHASE

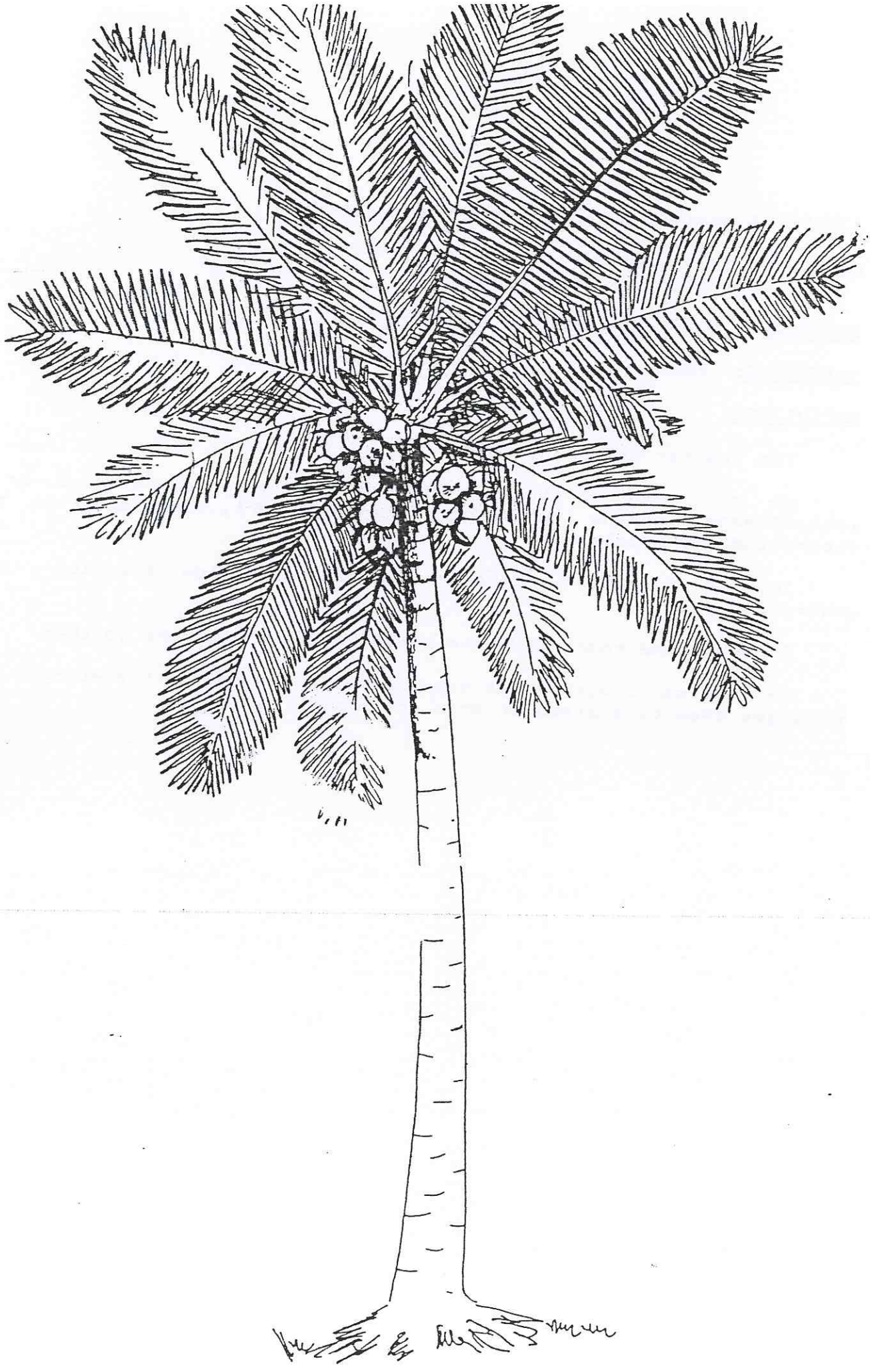
The teacher provides copies or photocopies of the following mary, which should be put in the agriculture exercise books.

The coconut palm has roots, a tall trunk and leaves, palm fronds che top of the trunk.

The fruit is also there: coconuts, which provide copra, coconut lk and edible flesh.

The wood and fronds are used to make houses.

The coconut palm is an essential tree in the Pacific and in Vanuatu.



LESSON 10

TITLE: Story: "The legend of the coconut palm".

AIMS: To tell a story
Comprehension of the story.

DURATION: The time taken to tell the story.

MATERIALS: None.

ACTIVITIES:

The teacher reads the story.

He may read it slowly in one go or he may read it in 2 or 3 installments, asking questions after each part, depending on how interested the pupils are.

Try to ascertain whether the pupils can follow the story and understand it.

Ask what the characters are called and what happens to them.

If they can imagine what happens after the end of the story, you could get them to explain or draw the story.

THE LEGEND OF THE COCONUT PALM

I. Hina's marriage

1. One upon a time, in the district of Papeari, there was a beautiful girl called Hina. She was the Chief's daughter. She had magnificent dark eyes, a body as lithe as a liana and such a slim figure that no-one could dance better than she. Her long hair was as dark as her eyes, as shiny as silk and made her the prettiest girl in Tahiti.

2. When she was sixteen her father decided she should marry. So he started to look for a husband. But he didn't want just anybody. Only a Prince would be worthy of Hina. Alas! There were none in the region. But one day, the impending marriage of Hina was announced to the people. The date was set. The whole district was invited.

3. At last the great day arrived. Dressed in a magnificent robe of fine tapa and crowned with a splendid tiara, Hina waited for her father to introduce her to her husband-to-be. For the beautiful young girl had never seen her intended.

4. The tam-tams beat, the joyous crowd shouted with impatience. The Chief came to meet his daughter and her mother at the foot of a great banyan tree. Hina could not hide her horror when she caught sight of a horrible eel with a giant body and enormous head ; it was Puhi, the Prince of the Eels.

5. "Oh, father," she cried, throwing herself into the Chief's arms, "why do you want me to marry this monster. I could never, never do it" and without waiting for any explanation, Hina, terror stricken, ran away along the beach and soon disappeared from the other side of the bay.

THE LEGEND OF THE COCONUT PALM

II. Hina and Maui

1. While the girl was running away, Puhi, wild with rage, began to roar:
"Take care, haughty Hina. You don't want me and for that misfortune will beset the islands. So, you must kiss me on the mouth, eat my flesh, drink my water, eat my heart! Otherwise, you will die.

2. But the poor girl didn't hear. She was running and running. The sun was just about to set when she got to Aketura. There she found an empty fare in the shade of some big trees. She hid inside and went to sleep.

3. But the house belonged to Maui, the evil god. When he got back from fishing he was dazzled by a bright light coming from his house. It was Hina's hair which was shining so brightly. In fact, while she had been running away, the last ray of sunshine, not wishing to die, had hidden in her hair. This is why her hair was shining so.
She told her terrible story to Maui, who agreed to hide her and protect her.

4. The next day, Hina and Maui spotted Puhi, the Prince of the Eels, beyond the reef. He too had been attracted by the brightness of the girl's hair. Puhi tried to get into the lagoon but he couldn't find a way in. He opened up a wide breach in the reef with one great blow of his mighty tail.

5. Maui then took a few locks of Hina's hair and plaited them into a long, strong wire. He attached a hook to it, threw his line into the water and captured the monster, which he then cut into three pieces.

THE LEGEND OF THE COCONUT PALM
III. The strange tree

1. Maui wrapped the eel's head in a banana leaf and gave the parcel to Hina. "You can go home now. Take this parcel with you. When you get home, your father will destroy this horrible thing. But you must never put the parcel down... Don't forget!"
Hina thanked her rescuer and left in the company of seven servant girls provided by Maui.

2. It takes over two hours to walk from Aketura to Tererauta. It's a long way and the sun was fierce. The girls came to a river where the water was fresh and clean. The seven servant girls decided to bathe while Hina stayed on the riverbank.

3. But the temptation was too great. Forgetting Maui's warning, Hina put the parcel on the ground and joined her companions. Suddenly, with a rumble of thunder, the earth opened up and swallowed the eel's head.
A strange tree then appeared from the gaping hole. A long, long trunk came up from the earth, growing taller than the houses and all the other trees along the sea-shore. When it reached 30 metres in height, the tree finally stopped growing and at the top a splendid array of huge palm fronds appeared, green and shining and waving gently in the wind. The first coconut palm had just been born. No-one had ever seen one before.
"It's trunk looks like the body of a giant eel," said one of the young servant girls.

THE LEGEND OF THE COCONUT PALM
IV. Hina's punishment

1. Hardly had the tall, tall tree reached up into the sky than a voice came from the sea. It was Maui. "Hina, you have disobeyed me. You put the parcel down on the ground. Because of this, a great serrow will befall our islands. You must be punished. I condemn you to live here, at the foot of this new tree. You shall never return to your parents' home. You shall live here, on the banks of this river. The tree shall be tabu: it shall be absolutely forbidden to eat its fruit."

2. Some time later, Hina married Teva, a handsome young fisherman who lived at the mouth of the river. They had two pretty daughters. The first, Hinarapa, was as beautiful as a ray of sunshine on the morning dew.
The second, Hinamoe, was as beautiful as a ray of moonlight on the fronds of the coconut palm. Hina was proud of her daughters and the little family was happy.

3. The years passed. The first coconut palm bore fruit. They germinated all round the fare and produced trees all around. Some of the fruit was carried away by the river and down to the sea. These coconuts soon came ashore on the beaches of other islands, where they produced more coconut palms. This strange and magnificent tree spread everywhere but remained "tabu".

THE LEGEND OF THE COCONUT PALM

V

1. Hina forgot the bad days. She was happy. But a terrible misfortune was to strike her family. Despite the "tabu", the little girls wished to taste the fruit of the tall, tall tree with the fronds at the top.
As soon as they touched the fruit, the unfortunate girls were changed into clouds and carried away over the sea. Poor Hina was inconsolable. Her neighbours could often hear her crying or sadly singing old Tahitian melodies.

2. Days, months and years passed. A great drought devastated the country. Not a drop of rain fell on the parched earth. The sun scorched everything: taro, yams, bananas. Hundreds of fish were thrown up onto the beaches of the lagoon. Children and old people began to die from lack of food. Only the coconut palm could withstand the sun. Its fruit could have saved many lives but it was still "tabu".

3. Hina too became weak. Fever wracked her body. One day she had a dream. She saw Puhi, Prince of the Eels, who said: "I still love you and I don't want you to die. I give you permission to be the first to eat my fruit."
Hina described her dream to Teva, who thought it was a trick on the part of Puhi. But he could see that his wife was about to die, so he took a coconut. He removed the husk and pierced one of the three brown spots on the shell. A sweet, clear, slightly sugary liquid ran out.

THE LEGEND OF THE COCONUT PALM
VI. Puhi's pardon

1. Teva ran to Hina, gave her the nut and begged her to drink. Hi lifted the fruit to her lips and drank the wonderful liquid. she sipped, her strength gradually returned. When she was longer thirsty, she gave the rest of the liquid to Teva.
"Open the shell now; perhaps there is something else inside. Pu told me that we would also eat his flesh."
Teva opened the fruit with a stone and found inside some fle which was perfectly white, quite firm, sweet and oily.

2. Hina and Teva grew a little stonger. They went outside their fa and drank and ate more fruit. Teva climbed up to get a few and these he discovered a soft and delicious jelly.
"Let's try this," said Hina, pointing to a sprouting nut.
Inside, Teva found neither liquid, nor flesh, but a spongy a deliciously sweet substance in the shape of a heart.
"Oh!," cried Hina, "it's Puhi's heart. He told me that I wou kiss him on the mouth, drink his water, eat his flesh and h heart. Poor Puhi, who took pity on us. Poor Puhi, who has forg ven my errors! Quick, let's tell the good news to the who district. The "tabu" is lifted. We are saved, thanks to Puh Prince of the Eels."

LESSON 11

TITLE: What grows in the garden.

AIMS: To discover what grows in the garden. In several visits, the pupils look at garden vegetables and plants over the course of the year.
You could make a list.

DURATION: Several short visits to the school garden. If the class cannot visit a school garden, you should try to visit a garden in the village.

MATERIALS: None.

ACTIVITIES:

This lesson takes the form of several visits to a garden (school, family, village).

Two or three times a term the class goes to a garden to discover plants and vegetables.

The teacher gets the pupils to name the things they see.

This is mainly an observation lesson and a vocabulary lesson.

T - "What can we see in the garden?"
T - "Do you know the name of this plant?"

The teacher points to several different plants.

T - "What do we do with this plant?"

The teacher asks this question about several different plants.

T - "Do we see these plants all the year round?"

The teacher gets the class to repeat correct answers.

The teacher asks these questions during each visit.

Gradually, over the course of the year, the pupils learn to recognise and name plants growing in the garden,

After each visit the teacher writes the names of plants on the blackboard and the pupils read them together.

You could question pupils individually.

After the visits, the pupils could copy the following summary into their agriculture exercise books:

Notes

Summaries should be learnt by pupils. The teacher could make regular checks on how well they have been learnt.

SUMMARY TO BE COPIED

We may find the following plants in a garden :

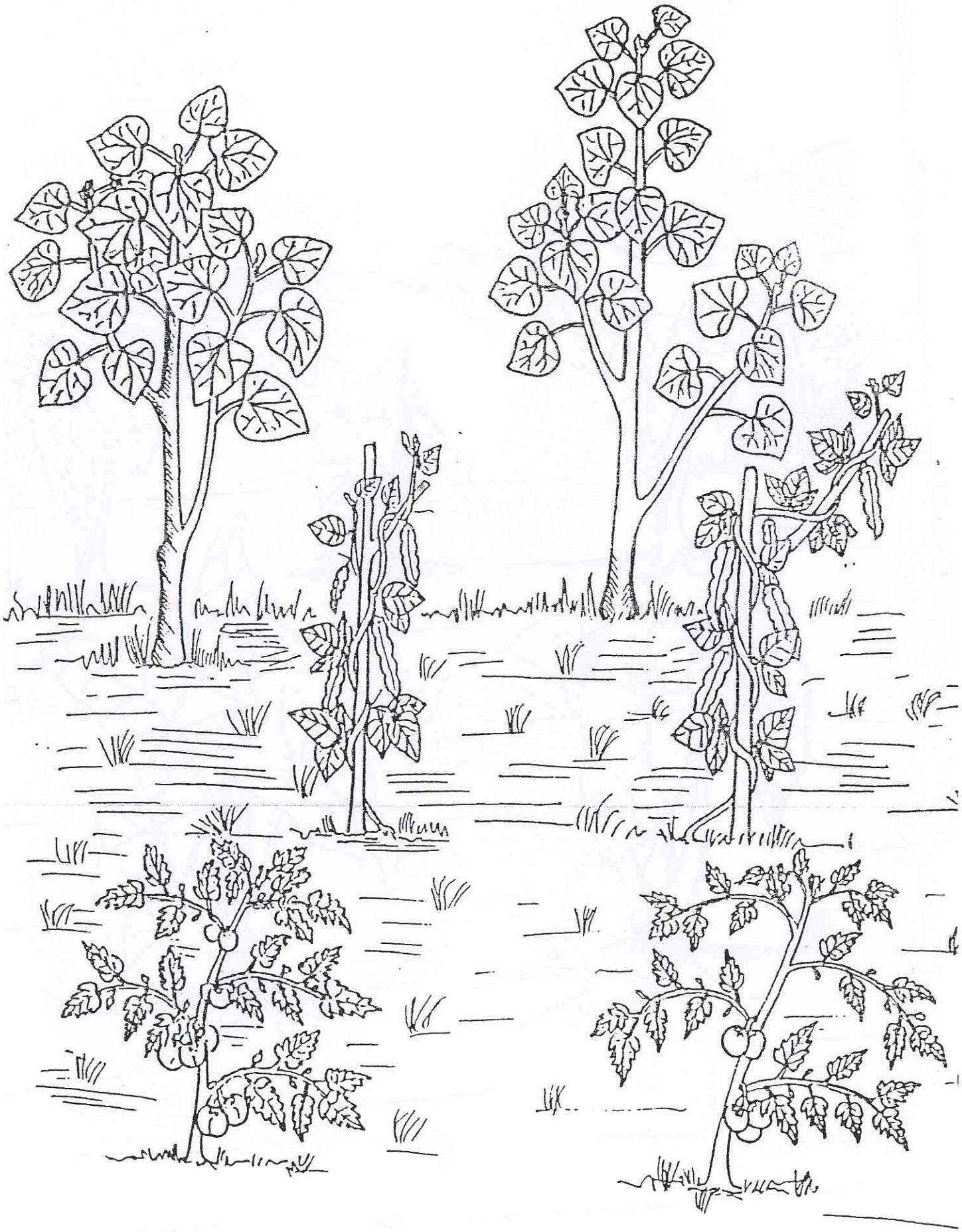
- tomatoes
- sweet potatoes
- Chinese cabbage
- lettuce
- beans
- yams
- taro
- manioc

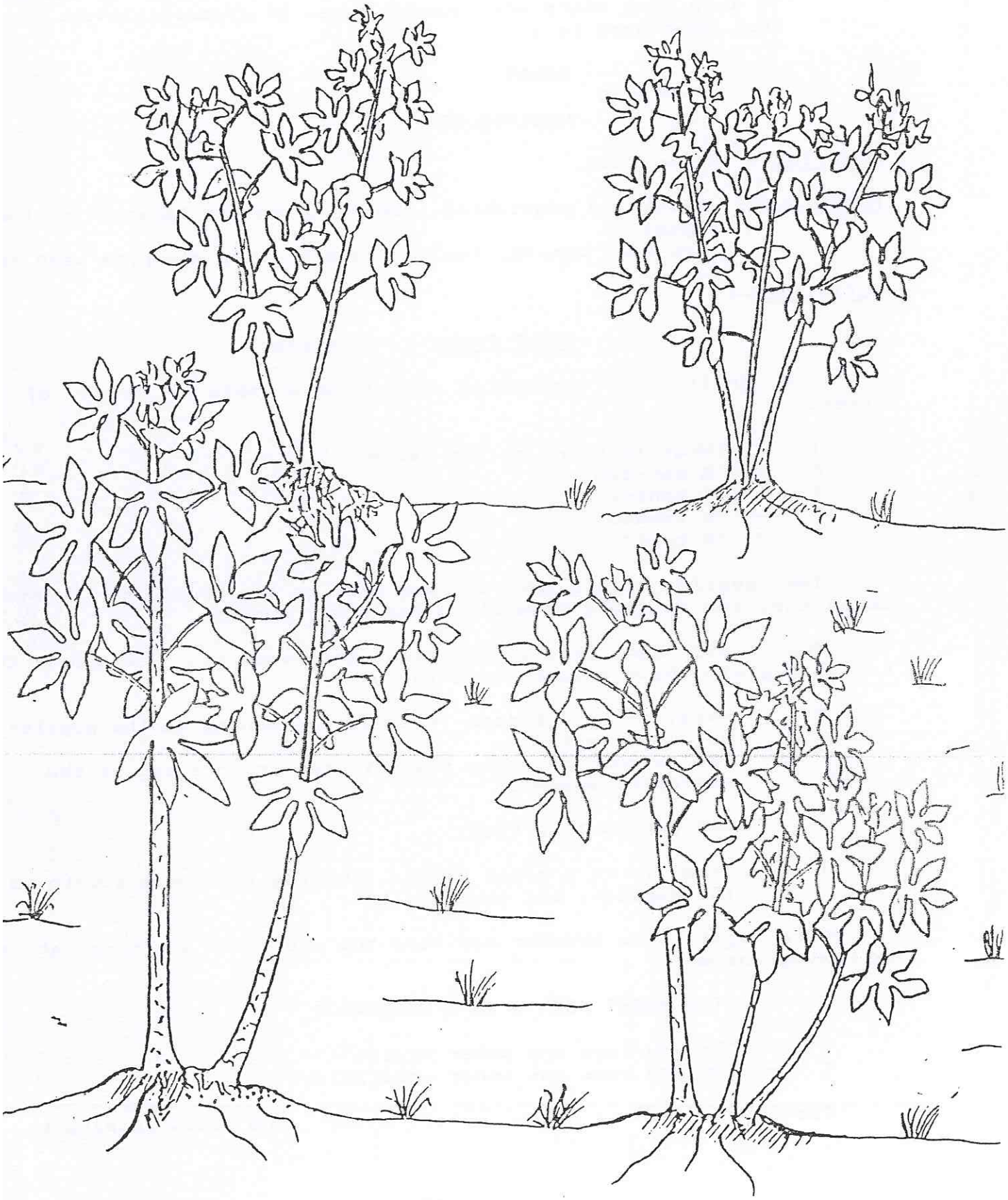
These plants do not all grow at the same time ; we can have vegetables all year round.

Questions on drawings I, II, III.

T - "What can we see in drawings I, II, III?"
- "What are these plants called?"
- "When do they grow?"

The teacher should correct pupils' mistakes.
Correct answers should be repeated together.





LESSON 12

TITLE : Classifying plants.

AIMS : To attempt to classify plants which are familiar to the pupil
To show that there are several types of classification.
That used here is :

PLANTS
- FRUIT
- VEGETABLES

DURATION : 25 minutes.

MATERIALS : Fruit and vegetables, depending on the location of the school.
(Paw-paw, banana, tomato, taro are the examples used here)

ACTIVITIES :

GROUP PHASE : in class

The fruit and vegetables are put on a table in front of the class.

T - "What is there on the table?"
P - "A paw-paw"
P - "A banana"
P - "A tomato"
P - "A taro".

The pupils should come out and pick up the fruit or vegetable which they can name and show it to the other pupils.

The class then looks at the plant and names it. The pupils then try to explain their answers more fully.

T - "Yes, it is a banana (showing the banana to the pupils), but what is it?"
The teacher may help the children in arriving at the following answer:

THE BANANA IS A FRUIT

T - "Yes, it is a sweet potato (showing the sweet potato to the pupils), but what is it?"

Here again the teacher may help the pupils in arriving at the following answer:

THE SWEET POTATO IS A VEGETABLE

T - "Do you know any other fruits?"
T - "Do you know any other vegetables?"

Each time there is a new correct answer, the class repeats it.

The teacher enters each correct answer in the chart he has prepared on the blackboard.

FRUIT	VEGETABLES
BANANA	TOMATO
ORANGE	TARO
PINEAPPLE	YAM
PAW-PAW	MANIOC
	BEAN
	LETTUCE
	POTATO

INDIVIDUAL WORK

The pupils copy this table into their agriculture exercise books.

The teacher could ask the pupils the names of fruit and vegetables as a check.

LESSON 13

TITLE: Garden needs: presentation
Garden care: presentation.

AIMS: To show that a healthy garden requires care and attention.
The garden must be maintained if it is to produce good vegetables and plants.
One must work in the garden and look after it.

DURATION: 25 minutes.

MATERIALS: None.

ACTIVITIES:

GROUP PHASE

1) First part

The teacher gathers the pupils round him and asks:

T - "What is a garden?"
T - "What do we find in a garden?"
T - "What do we have to do to get these plants?"
T - "Do these plants grow all on their own?"

Through the answers, the teacher tries to get the pupils to name the vegetables growing in the garden.

HE COULD ASK THE CHILDREN WHAT COLOUR THE VEGETABLES ARE WHEN THEY ARE HARVESTED (AND FRUIT TOO). HE ALSO ASKS WHEN THEY SHOULD BE HARVESTED.

T - "Do tomatoes and lettuces grow all on their own?"
T - "What has to be done to make them grow?"

The pupils should try to say that the soil should be prepared, seeds should be sown and watered, etc.

The teacher writes down correct answers in order to arrive at the following summary:

"In order to obtain a good garden a plot of land must be cleared and weeded. It should fenced and small furrows should be made. Seeds of different plants are sown.

The seeds should be planted in a particular place, as shown in the following diagram:

TOMATOES		LETTUCE
P A T H	P	P A T H
CHINESE CABBAGE	A	RADISH
P A T H	T	P A T H
BEANS	H	YAMS
P A T H		P A T H
TARO		SWEET POTATO

The garden should be watered when it doesn't rain and it should be weeded and tended.

After harvesting, the old plants should be uprooted and the ground dug.

The garden is alive and requires care: this is GARDENING WORK.

2) Second part

The teacher shows the three drawings to the children.

T - "What can we see in drawing I?"
- "What can we see in drawing II?"
- "What can we see in drawing III?"

The answers are studied together.

Through the answers, we arrive at the summary written on the board by the teacher.

This exercise serves as a test.

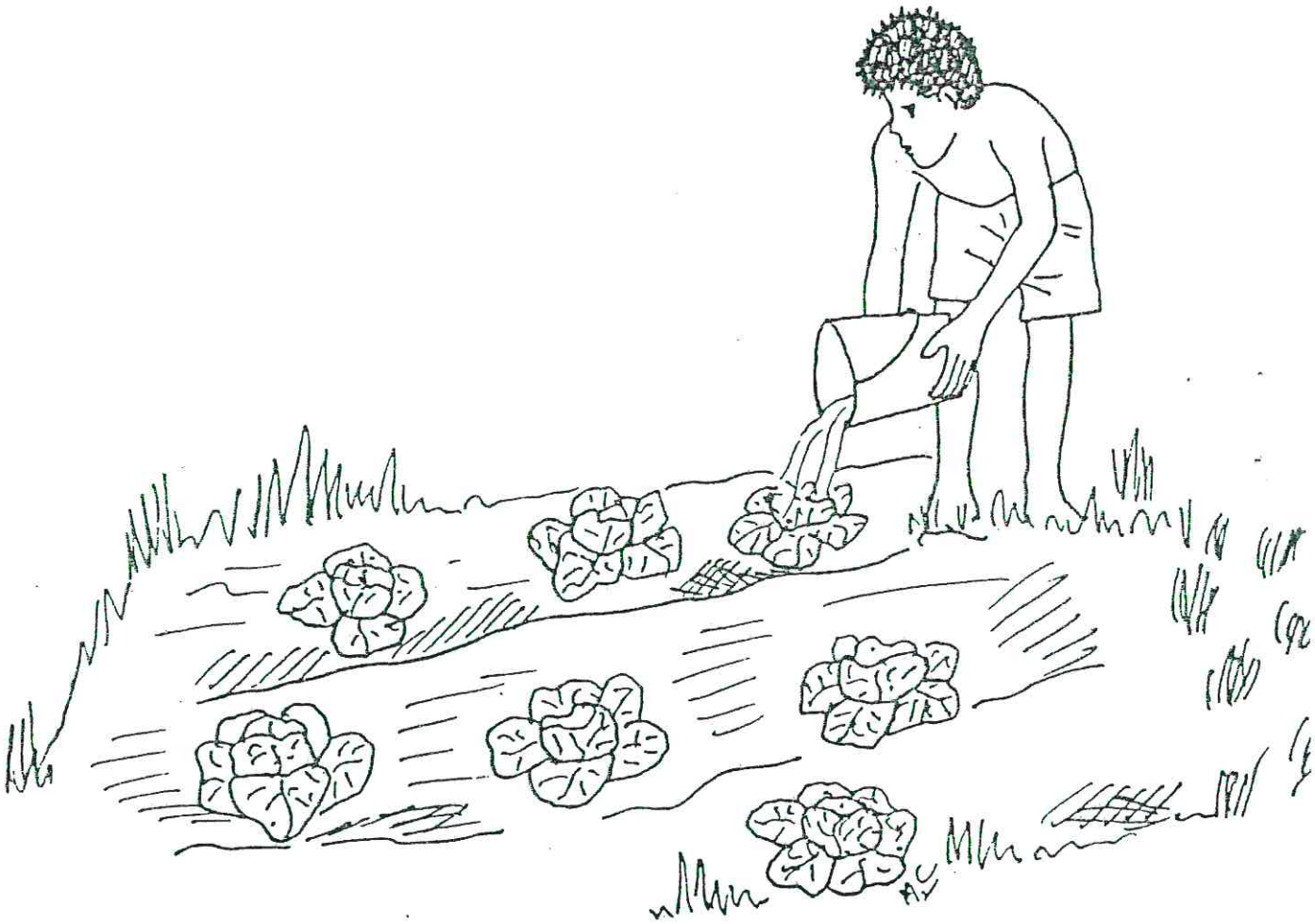
INDIVIDUAL PHASE

1. The pupils copy into their agriculture exercise books the summary on the board and draw the plan of the garden.

2. Activities: Language study.
Look for the following words: to dig
harvest
to weed
seeds

3. Possible drawing activities (optional).

- draw seeds
- draw a garden
- draw some fruit
- draw some vegetables



LESSON 14

TITLE: Assessment

AIMS: To assess the pupils' level of attainment in agriculture.
To test the level of knowledge retained.

DURATION: 25 minutes.

MATERIALS: None.

ACTIVITIES:

INDIVIDUAL PHASE

The teacher makes a short assessment of the pupils by means of some simple questions.

1) Give the names of three fruits.
2) Give the names of three vegetables.
3) Give the names of three trees.
4) Draw a plant of your own choosing (or a fruit, vegetable, flower or tree).
5) What colour is a ripe tomato?

LESSON 15

TITLE: Concepts of colour: light and dark shades.

AIMS: To demonstrate and study the concept of shades of colour: l as opposed to dark.

DURATION: 25 minutes.

MATERIALS: White chalk, sand, coral, black objects (to be chosen) grey objects (to be found in the classroom, to be brou by the pupils.

ACTIVITIES:

GROUP PHASE

The teacher places various objects on the table and gathers children around it.

The teacher has collected these objects before the lesson order to demonstrate light objects and dark objects.

The teacher asks the pupils:

T - "What can we see on the table?"

The pupils put up their hands to answer and show the objects their friends.

In this way, if the pupil is wrong, the other pupils can corre him by pointing to and naming the objects.

For each correct answer, the whole class repeats it out lond.

Then the teacher asks how all these objects could be classified.

(The teacher points to the light and dark objects).

The pupils make several suggestions.

Large objects
Small objects
Hard objects

Perhaps colour or substance.

The teacher takes up the idea of colour.

Among the objects, there is a sheet of white paper. He shows the sheet of paper to the pupils.

T - "What is this?"
P - "A sheet of paper."
T - "A sheet of white paper; it is white"
P - "It is a sheet of white paper, it is white.

Then the teacher introduces the following concept:

T - "The sheet of paper is light ; it is a light object."
P - "The sheet of paper is light; it is a light object."

Then the pupils point to all the light objects and name them.

Then the teacher explains the opposite concept:

He shows the pupils a black pen (or other black object)

T - "This is a black pen; it is a dark object."
P - "It is a black pen; it is a dark object."

Then the pupils point to all the dark objects and name them.

INDIVIDUAL PHASE

1) The pupils draw a light object.
2) The pupils draw a dark object.

LESSON 16

TITLE: Concept: ideas of ripe, unripe.

AIMS: To demonstrate and study the ideas of ripe and unripe. Ripe as opposed to unripe. The teacher again uses the classification method.

DURATION: 25 minutes.

MATERIALS: Some ripe fruit and some unripe fruit, depending on what is available in the locality.

ACTIVITIES:

GROUP PHASE

The teacher places various fruits on the table and gathers the pupils round it.

The fruit has been collected by the teacher before the lesson in order to display ripe and unripe fruit.

The teacher questions the pupils.

T - "What can we see on the table?"

The pupils put up their hands to answer.

If they know the right answer, they show the fruit they recognised to their friends and name it.

The teacher and the whole class repeat correct answers.

T, P1, P2: - "This is a banana."
- "This is a paw-paw."

The teacher displays an unripe paw-paw

T - "What is this?"
P1, P2 - "A paw-paw."
T - "Can we eat it? Is it good to eat?"

Note:

If the teacher can, he should ask the same question in two different ways in order to familiarise the children with the language of education.

P1, P2 - "No, it is not good to eat."
T - "Why is it not good to eat?"

The teacher may help the pupils to arrive at the following:

P1, P2 - "It is not good to eat because it is unripe."

The teacher displays a ripe paw-paw

T – "What is this?"
P1, P2 – "A paw-paw."
T – "Can we eat it, is it good to eat?"
P1, P2 – "Yes, we can eat it."
– "Yes, it is good to eat."
T – "It is good to eat because it is ripe. The other paw-paw was not good to eat because it was unripe."

The pupils repeat this sentence.

Then they classify the fruit by naming two categories:

1) Unripe fruit
2) Ripe fruit.

INDIVIDUAL PHASE

The pupils copy the following summary into their exercise books.

We must eat ripe fruit and vegetables.

We must not pick unripe fruit and vegetables.

LESSON 17

TITLE: Uses of trees.

AIMS: To demonstrate and discover the various uses of wood, the uses of trees in the life of man and animals.

DURATION: 25 minutes.

MATERIALS: None.

ACTIVITIES:

GROUP PHASE

The teacher gathers the pupils round him and shows them the four drawings: I, II, III, IV.

This is an oral session between the teacher and the class. The drawings are to be described.

Correct answers should be noted on the blackboard in order to compile a summary for the pupils to copy into their agriculture exercise books.

T - "What can we see in drawing I?"

The pupils answer.

T - "Do you know the names of these trees?"

Then the teacher proceeds similarly for the other drawings.

T - "What can we see in drawing II?"

T - "What can we see in drawing III

T - "What can we see in drawing IV?"

Each correct answer, which is written on the blackboard, is repeated by the pupils.

INDIVIDUAL PHASE

Summary to be copied into agriculture exercise books:

Trees make forests and provide shade and shelter for animals.

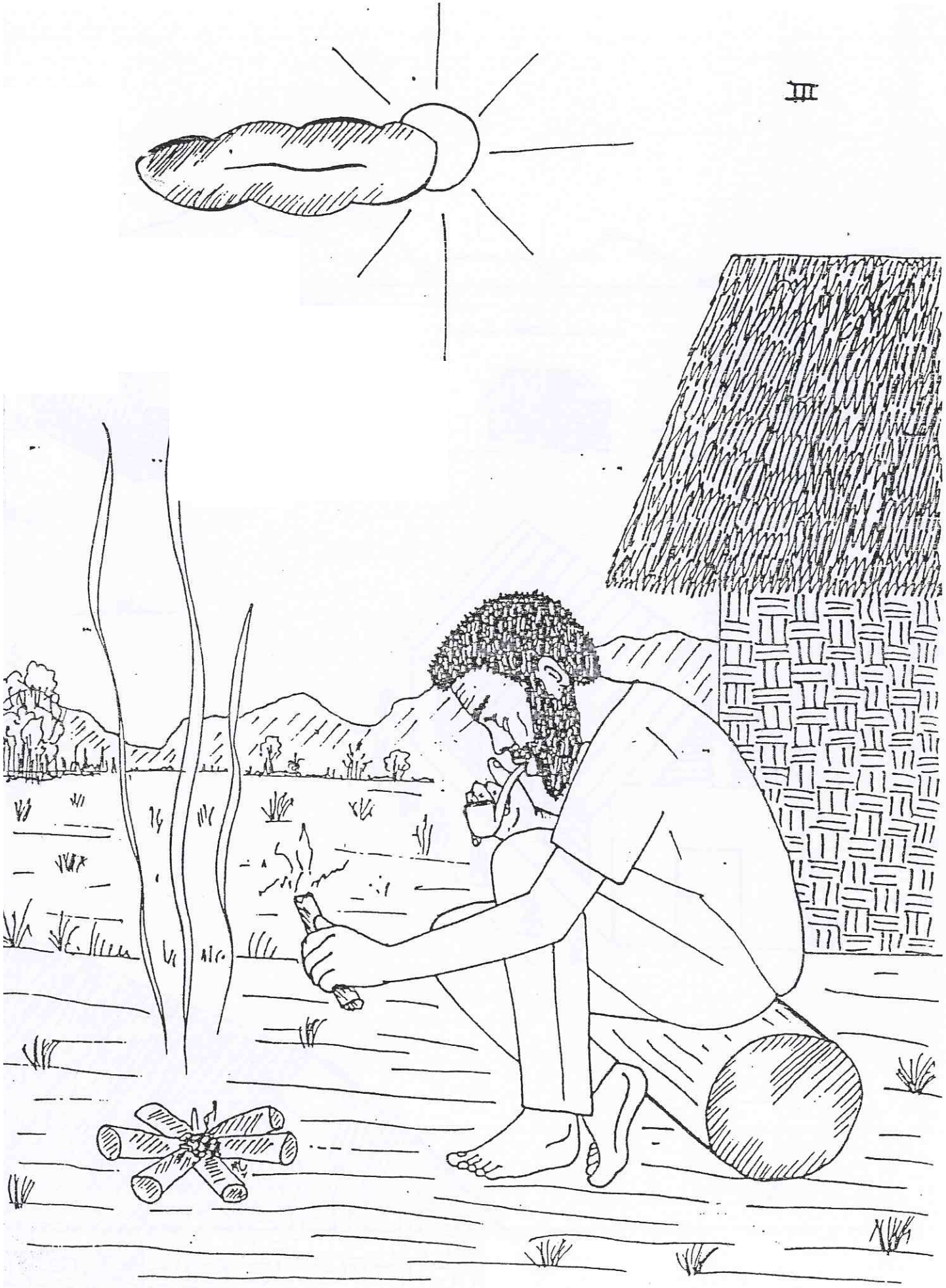
Trees give wood to make fires for cooking food and for making houses.

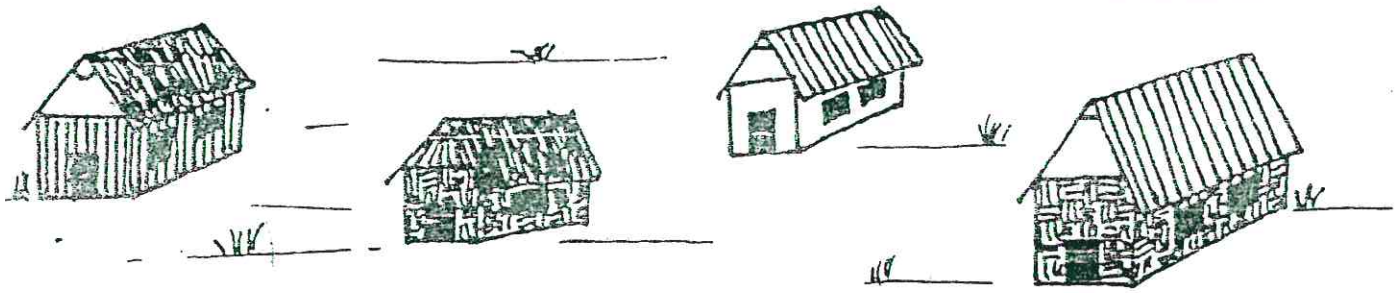
Wood and trees are essential for life. Trees are to be respected.

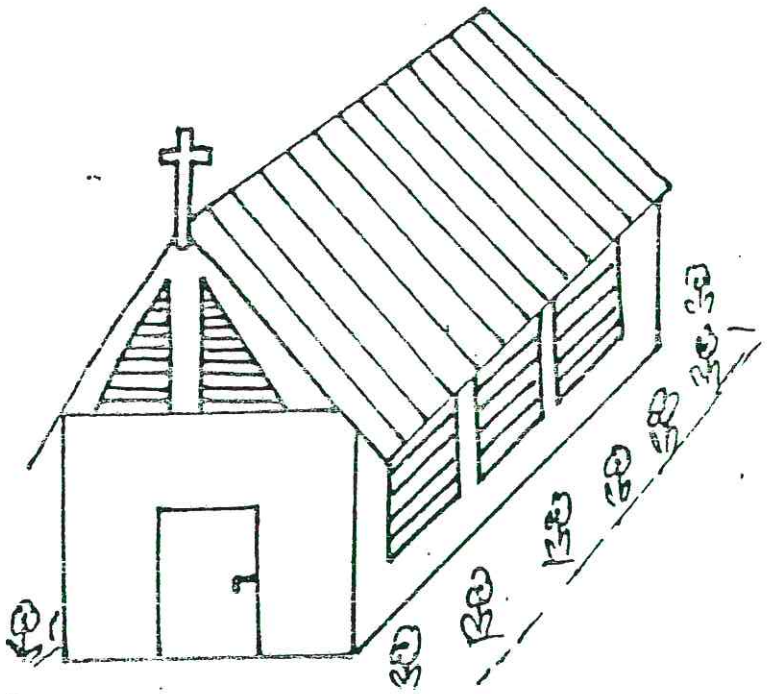

H

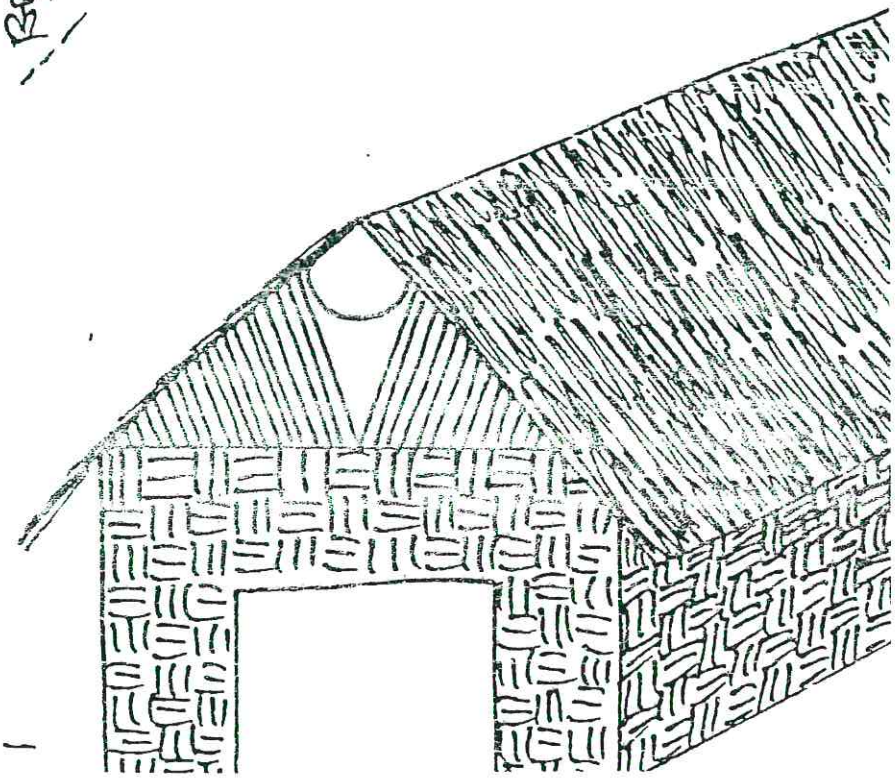

II

III









LESSON 18

TITLE: General Presentation

AIMS: General presentation, common animals, other living creatures

DURATION: 25 minutes

MATERIALS: None

ACTIVITIES:

The teacher reads the story :

"2 good friends"

Then allow the pupils to discuss the story amongst themselves.

Finally the pupils talk about the animals, what they know about the animals, what they understand.

No summary.

Two good friends

1. This poor old grand-father Rhinoceros had very poor ey sight! So poor that he could only see as far as the tip of hi horn. There he was, standing in the river with water reaching u to his knees, grunting and puffing.

He grunted and puffed:

"What bad luck! what bad luck, it is all obscure around me It would be much nicer to see clearly.

Standing with water reaching up to his knees, Grand-fathe Rhinoceros walked to and fro. He grunted and puffed.

He grunted and puffed.

2. As he was grunting and puffing, he heard a small shar voice.

It was the voice of Bunny Rabbit.

He was sitting on the bank of the river.

He was waiting and crying in his small pearcing voice:

"What a tragedy! What a tragedy, that this river is so wide I want to cross in order to go and nibble the soft grass tha grows on the other side!

"What is this I hear?" said Grand-father Rhinoceros.

"Someone who can see what is on the other side of the ri ver?"

3. With water reaching up to his knees, Grand-father Rhinocero walked to and fro.

He grunted and puffed.

He grunted and puffed.

"Where is this creature that can see the grass that grows o the other side of the river?"

"Here" said Bunny Rabbit's pearcing voice.

"And whose voice is this that's pearcing my ear?"

"It's mine, Bunny Rabbit."

Grand-father Rhinoceros with water reaching up to his knees walked to and fro. He grunted and puffed.

TWO GOOD FRIENDS

1. Grand-father Rhinoceros grunted and puffed:

"If you are willing,guide me and tell me what you can see, I am willing to take you to the other side, small voice pearcing my ears."

"With pleasure, right now, if you want Grand-father.

"Agreed, right now."

Bunny Rabbit jumped onto Grand-father Rhinoceros's back.

With water reaching his knees, he moved forward into the river and soon he was swimming across.

With his pearcing voice, Bunny Rabbit recounted all he could see ... as well as what he couldn't see!

2. Grand-father Rhinoceros moved quickly forward, he was happy. Therefore, he did not grunt; he did not puff.

He did not grunt, he did not puff.

Soon they both arrived on the other side of the river.

Bunny Rabbit nibbled everything he could find while Grand-father Rhinoceros moved to and fro with water reaching up to his knees.

He grunted and puffed.

"What a blessing! What a blessing to have someone to guide you."

3. Bunny Rabbit replied between mouthfuls:

"What a blessing! What a blessing to have someone to carry you."

From this day on, Grand-father Rhinoceros and Bunny Rabbit never travelled separately.

On the river bank, Grand-father Rhinoceros moved to and fro with water reaching up to his knees.

He no longer grunts, he no longer puffs.

Bunny Rabbit, sitting on his hindquarters and brushing his moustache, does not wail anymore.

"What a blessing! What a blessing!"

GENERAL INFORMATION

REARING MATERIALS : EXAMPLES

REARING CATERPILLARS:

In a box covered with a mosquito net. Feed the caterpillars wi the leaves of the plant on which they were found. Careful: sma caterpillars can change into big butterflies: provide a box th is big enough.
Study and take note of their behaviour and transformation.

FROGS' OR TOADS' SPAWN:

In an open jar (the tadpoles will eat the mosquito lava). Ma the water level at the side of the jar. Keep the same level water at all times by adding more water when level drops. Wh the tadpoles hatch, feed them first with small insects, then wi pieces of meat.
Study, take note, draw.

FRESH-WATER FISH:

Same as above. Put clean sand in the jar. Give it a little eat. Siphon to change the water from time to time. Study, ta notes and draw.

ANTS:

In a jar with sides covered with dark paper (ants hate light Fill the jar half full with soil. Place a saucer containing sug on the ground. You can catch the ants yourself to put in the t saucer or wait for them to come by themselves. As soon as t ants enter the jar, carefully close it with a fine tissue. Stud take note, draw. See card n°.

A GARDEN IN A PLATE:

Cover a plate with toilet paper. Scatter different sorts of see on the paper (lentil, beans, orange pips...). Keep the pap moist at all times. Study, take note, draw.

Make observations in the field:

1.1 Features of the landscape.
- Is it a regular landscape? (a forest, meadow or varied?...)
- Has it been shaped by man? (cultivation, reafforestation, quarries...)
- Are the underground rocks visible? Do they have an influence on the moulding of the landscape? (plane, gentle slope).

The pupils will be asked to describe what human activities have contributed to the changing patterns of the landscape: electric posts and cables, buildings, roads, cultivation...

1.2 Climatic factors:
- Temperature and sunlight reading
- Location of atmospheric disturbances.

. Soil: How is it made up? Is it porous? Impermeable?

Sometimes it is difficult to measure the amount of sunlight. Nevertheless, an evaluation could be made. The location could be the shadow of a hill, or be in the sun continuously ; the public could be asked to give their opinions on the advantages and disadvantages of sunlight, if the soil is fertile or poor, if it rains often etc...

Temperature should be measured with a thermometer: measure the temperature in the shade and away from the wind: at ground level and at 1 metre above the ground.
Also locate the wind: from which direction is it blowing?
Soil: it is always difficult to find out if the soil is permeable or not. Here, the soils are often permeable: water soaks in easily. It must also be taken into consideration that in some regions the soil is impermeable: rain-water does not soak in or drain away thus ponds and swamps are produced.

1.4 Animal life:
- Make a list of the different species.
- Study the different behaviour of animals (flights of birds, activities in an ant-hill).
- Take note of human influence (eg: hunting reserves)
This preparation will allow the teacher to be more useful during the trip.

The list of animal species will serve later to produce the classification of animals.

II. AN OUTING WITH THE PUPILS
Outings could be divided into three groups:

II.1 The outing as the starting point of activities.
Outing to deepen knowledge and find answers to a precise problem arising from activities.
Outing to test knowledge which would enable an evaluation to be made of the success of previous activities.

II.2 Preparation with the pupils:

- Give the pupils an idea to guide them: For example, we wil be studying flowers, trees or animals or 1 animal, or leave etc.
- Write a guide-card (eg: cards 12 and 14), prepare questionaire, diagrams etc...
- Provide rules governing the sort of material required: brin what you need for writing, drawing, photographing (ask for th camera at the Education-office), bring plastic bags for col lecting samples, tickets, containers with good tops etc...

The teacher must inform the pupils to collect only what i necessary for future observations.

II.3 The outing:

The pupils will be reminded of the rules of observation: stud closely, make drawings, sketches, note the observations or wha the teacher is saying and take notes, note the questions. Ne discoveries must always be made known to others. The teache must always be alert, taking note of the questions and comment made by the pupils, advising them.

II.4 Straight to work

It is not easy to plan activity in class soon after the outing We can start by putting things in order:

- what we collected
- what we studied
- what questions we asked.

This is a very good lesson for the pupils to practice thei English: They want to express themselves. For the teacher' part, these elements would be a basis for another activity from oral to written, working-out illustrated texts, scienc lessons etc...

AN OUTING IN THE FOREST

1. Plants

1. Demarcate your area of observation by planting a stake on each corner of a 100 m2 area.

2. Count the total number of trees .....
of shrubs .....
of creeping plants .....
the number of different species of trees .....
of shrubs .....
of creeping plants .....

3. Measure the height of some plants, for low shrubs, it could be done as follows:

The height h is assessed by a third person.

4. Study the branches. See if there are any leaves, flowers or fruits. If you find some mushrooms, describe them.

5. Collect a sample of some plant species for your group.

2. Animals

1. Study what the animals were doing when you saw them (running, flying, walking...)

2. Collect small insects from underneath the soil, shrubs, tree holes.

3. Locate and note the traces of living animals (song, nest, burrow, spider web, tracks...)

3. Soil

1. Study the soil under your feet; describe it

2. Dig a little bit of humus; what do you find when you dig?

HOW TO STUDY A TREE OR A SHRUB?	
APPEARENCE	- Normal appearance: Has the trunk got branches or Are the branches drooping, straight, bending? height compared to other surrounding trees? - Is the top sharp, rounded or spread out? - Bark: colour, crevices... - Tree trunk: As it got any shoots (sprouts)?
LEAVES	- Deciduous or evergreen - Alternate or opposite (study the arrangement of buds and stalks and the lenghth of the branches) - Simple or composed of leaflets? How many leaflets' How are they arranged? (study the form and veins of the limb). - The size.
FLOWERS	- Do they vary a lot according to the trees chosen? (see the chapters where they are described).
FRUITS AND SEEDS	- Shape - Colour - Solidity (hard fruit, soft fruit) - Seeds inside: number, shape, colour...
LIVING CONDITIONS	- Is it growing wild in a shaded or sunlight area, c or humid? - Has it been planted and looked after by man? (whe did the tree come from? When and how is it trimmed?) - Is it used as shade, for food, for various animal Which? When did you study them? What were they doing? - Is it sick? (can you see wood-eating insects or sig of fungus?
HUMAN USAGE	- Is the tree used as an ornament? - Do you harvest its bark? leaves? flowers? fruits? f what use? - Is the wood used as a raw material?

HOW TO STUDY AN ANIMAL	
Where does it live? (its living conditions)	- Does the area have sunlight? or shaded? dry? humid? hot? cool? - Is it living with many other animals of its kind? or with other species of animals? - Are there any signs of other living creatures? (spider web, empty shells, slough remains, tracks, manure...?
How does it live? (its actions)	- It eats. - What kind of food does it feed on? - Does it have any preferences? - How does it eat its food? - Does it leave any scraps? - It breaths. - How? - With what organs? - Where are they located? - It moves. - How? - With what organs? - When? - To do what? (look for food, as a defence) - It has senses. - Can it see? - Can it hear? - How does it react when disturbed? - It reproduces. - Is it a female or a male? - Is the female about to produce young ones? - What do the young ones look like? - How do they grow up?
What eats it? (What are its predadors?	- Does it have several different predators? - Does it live in the same area as its predator(s)? - How does it escape its predators? - Draw a food chain of the creature you are studying.

LESSON 19

TITLE: Animals we can see in the village.

AIMS: To write out a list of all the animals that we can see in the village.

DURATION: 25 minutes

MATERIAL: None.

ACTIVITIES:

GROUP PHASE

The pupils are asked to gather around the teacher and they are shown drawing I.

T - "What can you see in the drawing?
P1 - "An animal"
P2 - "A dog"

T - "We can see an animal, it is a dog"
P1, P2 - "We can see an animal, it is a dog."

The teacher could ask a few pupils to say what it is.

The same thing applies to drawings II and III

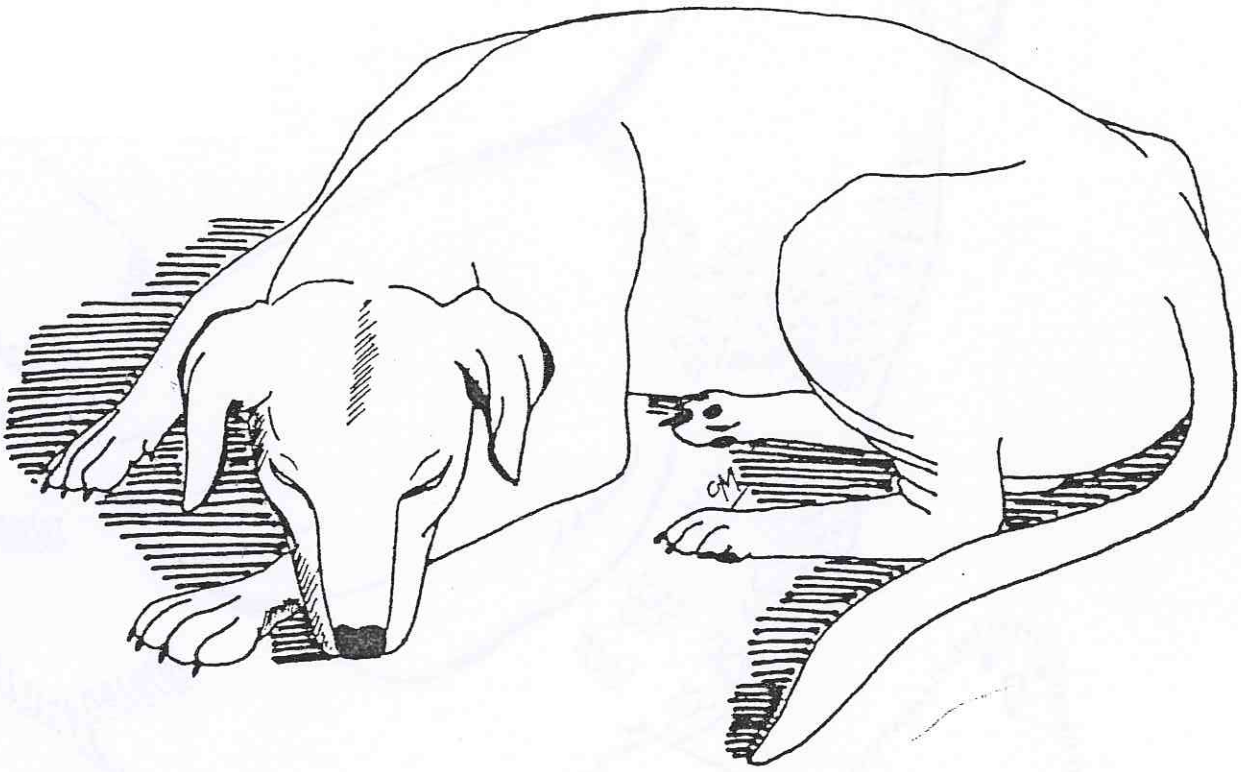
- What can you see in the drawing?
- What are their names?
- Could we see these animals?
- Do you know any other animals that we could find, see, meet in the village?
- On the backboard, the teacher writes the names of all the animals found by the pupils.

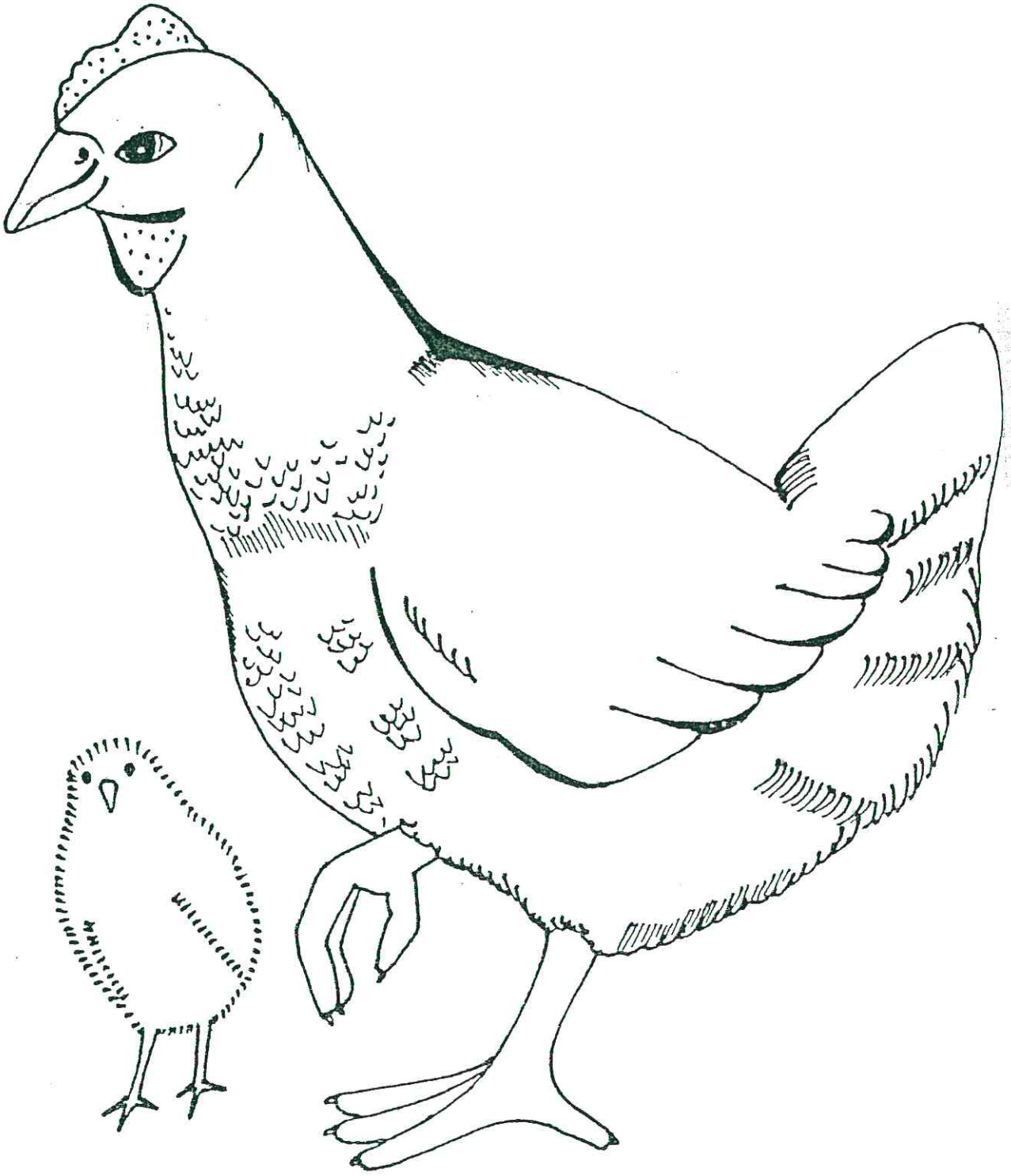
The cat, dog, pig, chicken, chick, cow, goat, horse(rare).

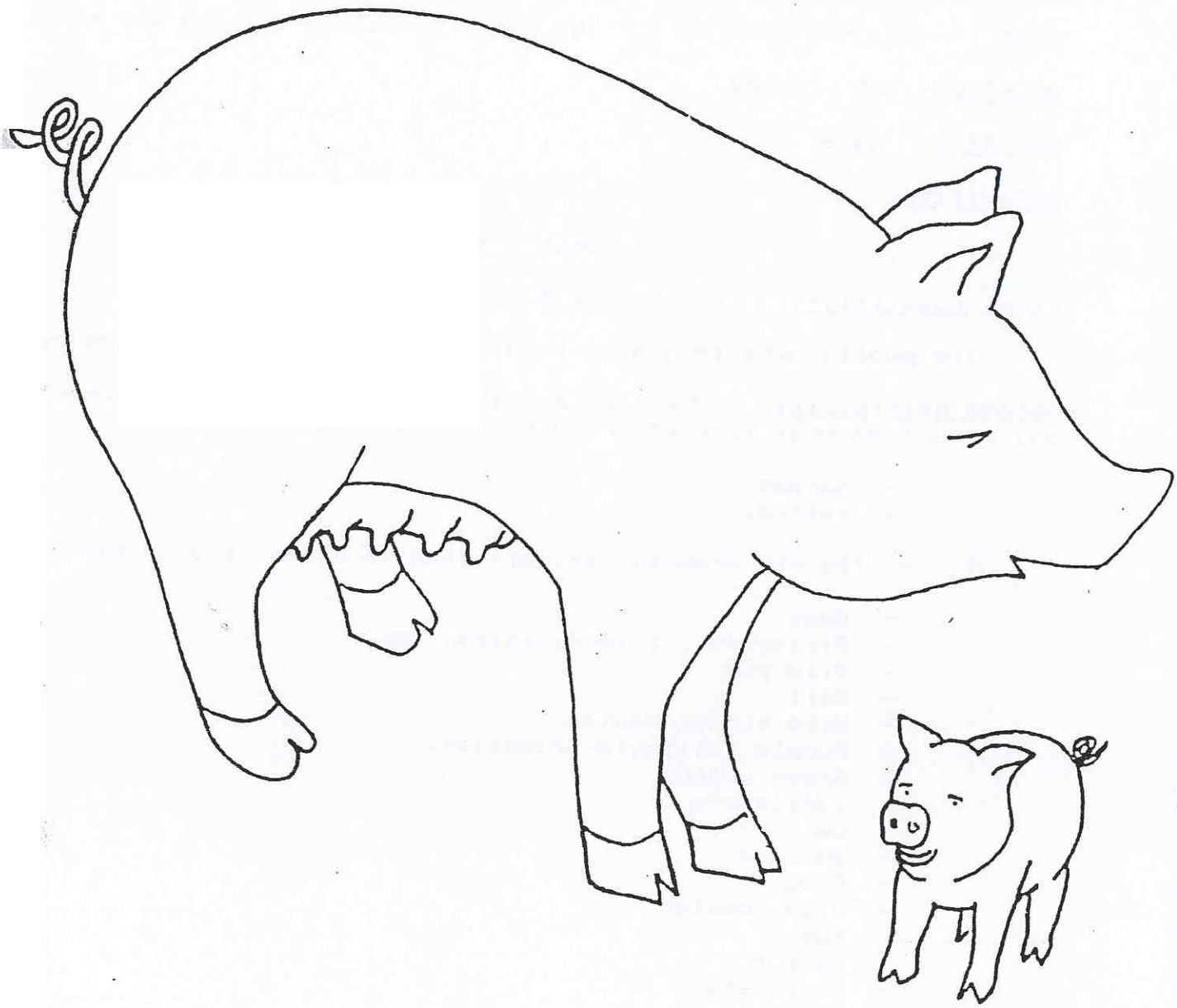
Then the teacher asks the class to read the names of the animals then some pupils individually.

INDIVIDUAL PHASE

The pupils copy into their exercise books the list of animals written on the board and found by the pupils.







LESSON 20

TITLE: Animals we can see in the bush.

AIMS: Produce a list of all the animals that we can see the bush.

DURATION: 25 minutes.

MATERIAL: None.

ACTIVITIES:

GROUP PHASE

First possibility: Trip to the bush and make observations:

The pupils note in their books the animals that they come across.

Second possibility: The teacher asks the pupils to gather around him and asks them what kind of animals they can see in the picture:

- horses
- cattle.

T – "Do you know any animals that we could find in the bush?"

- Goat
- Flying-fox, lizard, snake, rat
- Wild pig
- Rail
- Wild birds: noutou
- Purple gallinule (nambilak)
- Green pigeon
- Turtledove
- Owl
- Buzzard
- Frog
- Wild rooster
- Bat
- Parrot
- Kingfisher
- Heron
- Duck
- Snipe
- Gull, swallow, robin
- Spider, coconut crab.

The teacher jots down all the names of the animals the pupils find.

The pupils and the teacher read out the list on the board. Then the teacher questions some pupils individually.

INDIVIDUAL PHASE

The pupils copy into their books the list of animals on the board and found by them.

LESSON 21

TITLE: Animals: A trip to the village
A trip to the bush

AIMS: It involves a trip to the bush and another to the village to see and find some of the animals which we discussed in class. The part to be done in class consists of a description of what we have seen.

DURATION: 25 minutes.

MATERIAL: None.

ACTIVITIES:

GROUP PHASE

This lesson is an assessment of the trips made by the teacher and the pupils to the village and bush.

The pupils list all the animals and give details of:

- where they were found;
- what they eat;
- how many there were.

Then the pupils describe pictures I, II and III.

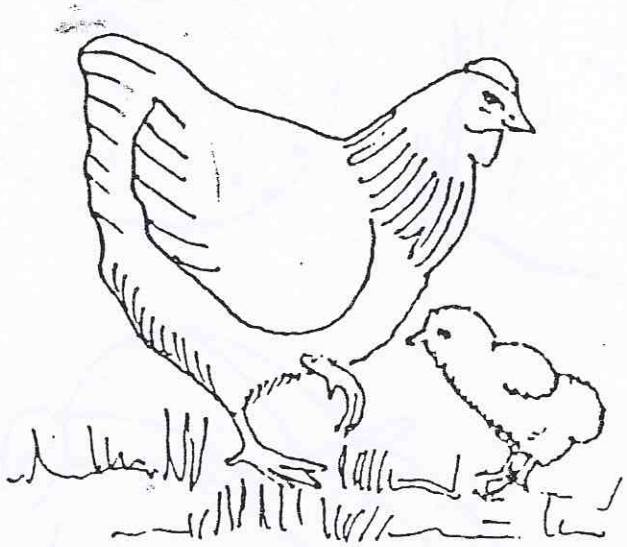
What can you see in picture I?
What can you see in picture II?
What can you see in picture III?

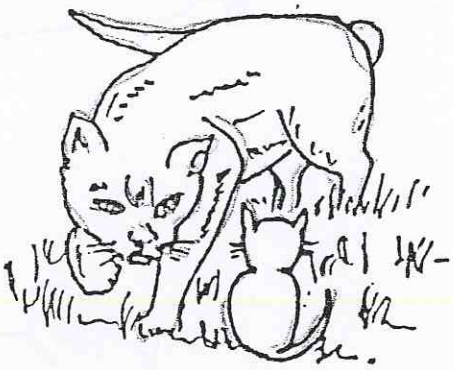
The purpose of this group exercise is to get control of and to assess acquisition of knowledge.

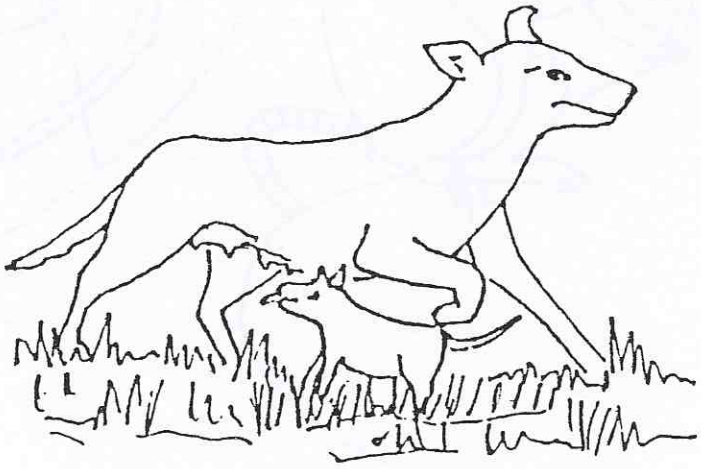
The pupils are questioned together.

To answer, the pupils must raise their hands.

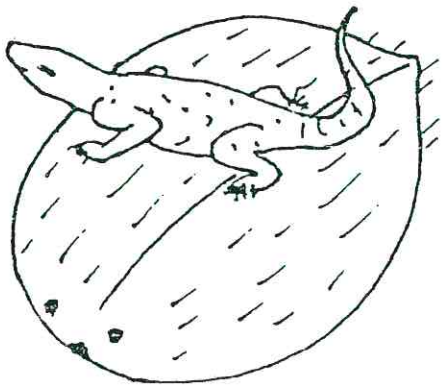
I

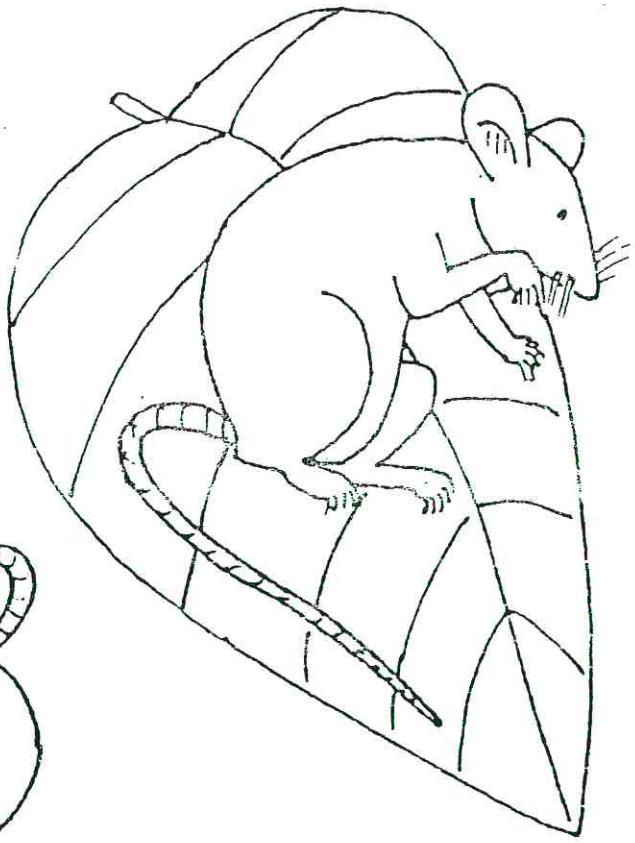






II





LESSON 22

TITLE: Animal stories.

AIMS: Tell stories about animals.
Comment on the stories.

DURATION: Varied: time required to tell and discuss the 2 stori

MATERIAL: None.

ACTIVITIES:

The teacher gathers the pupils around him.

The teacher can tell the strory while the pupils remain sti

He tells the story: My Cockerel.

Then the pupils discuss the story with the teacher.

He tells the story: The little Pig at School.

And the same thing goes for this story.

MY COCKEREL by Nanette Vakessa

My cockerel, my cockerel
My tiny red cockerel
I love you, my tiny red cockerel.

My cockerel, my cockerel,
You are growing bigger and bigger
I love you, my big red cockerel

My cockerel, my cockerel
You are becoming more and more fat
I love you, my fat red cockerel

My cockerel, my cockerel
You are growing taller and taller
I love you, my tall red cockerel

My cockerel, my cockerel
You are singing louder and louder
I love you, my noisy red cockerel

My cockerel, my cockerel
My big, fat, tall and noisy red cockerel
How I would love to eat you.

THE LITTLE PIG AT SCHOOL by Eunice Simbolo

One day Kalo and his father went hunting
They walked, walked and walked
They went deeper into the bush.

At last they reached a valley where there were many caves
"Sh! Kalo," said the father
"There must be some pigs sleeping in these caves"
They approached the caves very slowly
They soon heard a noise.

"What is it'," Kalo asked.
"It's a pig," his father replied.

Suddenly a sow came running out of the cave
Followed by four little piglets.

The sow ran so fast that they could not catch her
But the father caught a little piglet.

Kalo brought the pig home
and took good care of him.

He really loved the little pig
and took him everywhere he went.

One day, the little pig followed Kalo all the way to school
The little pig was crying and crying outside the school door.
The teacher opened the door
and the little pig ran quickly into the classroom.
The children started laughing
"We cannot have a pig inside the classroom," they said.

Kalo and the teacher put the little pig in a box
The little pig sat in the box in front of the class
At the end of the school day, the little pig
followed Kalo all the way home.

LESSON 23

TITLE: Rearing animals in class or in the school.

AIMS: Allow the pupils to take part in rearing:
Insects, mice, cats, fish, frogs: when rearing these creatures, the pupils will have an excellent area of observation.

DURATION: Not known. Time must be given for preparation then for different observations.

MATERIAL: Varies a lot depending on what is being reared.
Cartons and old containers could be used.

ACTIVITIES:

The teacher is free to choose whether or not to consider small rearing Projects. The following documents are recommended for usage if he wish:

Document I : Rearing materials
Document II : Small rearing projects.

REARING MATERIALS : EXAMPLES

REARING CATERPILLARS:

In a box covered with a mosquito net. Feed the caterpillars with the leaves of the plant on which they were found. Careful: small caterpillars can change into big butterflies: provide a box that is big enough.
Study and take note of their behaviour and transformation.

FROGS' OR TOADS' SPAWN:

In an open jar (the tadpoles will eat the mosquito lava). Mark the water level at the side of the jar. Keep the same level of water at all times by adding more water when level drops. When the tadpoles hatch, feed them first with small insects, then with pieces of meat.
Study, take note, draw.

FRESH-WATER FISH:

Same as above. Put clean sand in the jar. Give it a little to eat. Siphon to change the water from time to time. Study, take notes and draw.

ANTS:

In a jar with sides covered with dark paper (ants hate light). Fill the jar half full with soil. Place a saucer containing sugar on the ground. You can catch the ants yourself to put in the the saucer or wait for them to come by themselves. As soon as the ants enter the jar, carefully close it with a fine tissue. Study, take note, draw. See card n°.

DOCUMENT

SMALL REARING PROJECTS

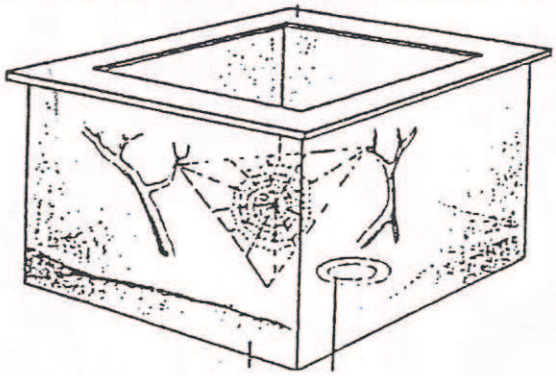
---------- Prepare and Observe ----------

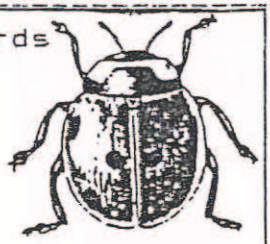
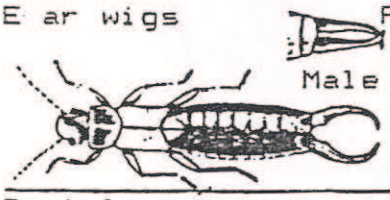
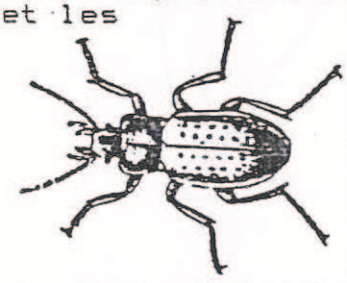
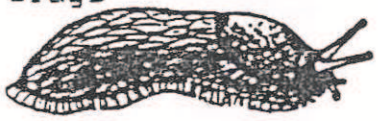
To make a good rearing box, it is almost always sufficient to use a simple aquarium with a fine net covering nailed to a wooden frame. Its preparation will depend on whichever animal is going to live in it (see table 2).

Here are some suggestions for different types of rearing.

Draw plenty of pictures of your observations: write comments in a book placed near the box and fill in your observation card.

Picture 1: Cage for a spider spinning a web.



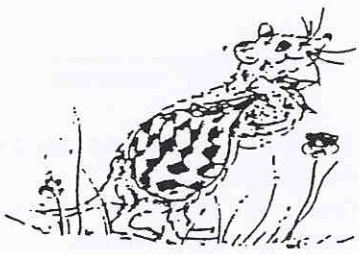
Animals	to be placed ih terrarium	What they eat
Ladybirds 	- protection: stones, moss - wet cotton-wool	jar filled with water + a branch with plant lice
E ar wigs  Female Male	- wet sand - Hiding place: stones, moss	worms and small snails
Beet les 	- wet cotton-wool - soil + dead leaves	earth worms small snails
Slugs 	- wet soil + dead leaves	potatoes apple bits

BOARDERS IN THE CLASS

Greedy Hamster
Foolish Hamster
Hairy Hamster
Mischievous Hamster
What are you doing
from evening to morning?

"I crunch and I gnaw
I gnaw and I crunch
the grain and the
shell
I crunch and I gnaw."

Pierre Gamarra



POEMS

FOR YOU TO READ

Cockchafer
Ladybirds
Here is the season
Of new grass
Of button-shaped flowers
Ladybirds,
Cockchafer
Cockchafer
Ladybirds
The song is nice
Together we will dance along with it
Ladybirds
Cockchafer.

Pierre Camarra

It's summer

Three tiny mosquitoes
Stung me:
One on the forehead
One on the nose
And the third
At the end of the foot!

Three tiny pimples grew:
One on the forehead
One on the nose
And the third
At the end of the foot!

Here am I, totally disfigured!
It's Summer

Thérèse Boudet

The Tortoise

Gypsy
Wrinkled and old-looking
Stretching its thin neck
She goes, pulling the caravan
Which is her home and her burden.

M. Mompezat

The Snail

Like and old freighter
Tracing its trail
Fellow snail
Makes a long journey

Then when its' hot
When every thing dries out
Fellow snail
Waiting for the cool air
Re-enters her shell.

Pierre Gamarra

Punishment

Mother fox to her young:
"If you are not good, you won't have any dessert"...

LESSON 24

TITLE: Story of "The four Little Mice".

AIMS: Discover the life of animals through a story.
On the basis of this story we can talk more about animals.

DURATION: Time to tell the story and to comment on it.

MATERIALS: None.

ACTIVITIES:

This lesson does not have any individual phase.

The teacher reads the story aloud. Then he asks questions of his own choice relating to the story.

Finally he could ask the pupils to talk freely about animals.

STORY OF THE FOUR LITTLE MICE

1. Mother Mouse was very upset. Her four children, Griset, Clairet, Blanquet and Nigret, named according to their fur, had left the deep hole in the attic wall in which they lived and this morning they had not returned.

She is old and not very agile. Yet she ran to uncle Ratigras who lived in a hole next door.

"Please good uncle could you make a check around the house. It's still dark and the people are still asleep and the cat is also sleeping in an armchair. You can check in every corner and enter every cupboard."

"Alright I'm going. May the black tomcat crunch me if I don't bring back your kids."

2. Mother mouse wiped her eyes with the end of her paw. She was really worried.

Ratigras took off at a good pace. He immediately ran to the kitchen. He knew Griset was very greedy!

Approaching a cupboard, he heard a doleful cry. He entered the cupboard through a hole eaten away under the door. On a shelf he saw a large pot of jam, almost empty and at the bottom, a mouse who was struggling. It was Griset. The poor little thing was trying to get out but his paws slipped on the smooth glass. Nothing for him to hold onto.

3. Ratigras quickly climbed up the jar. From the top, he bent and stretched his paw to Griset, he could not reach him. He then sat on the rim of the jar and lowered his long tail into the jar.

"Hold tight on to it!" he said to the young mouse:
Griset bit the tail between his teeth. He also tried to hold it with his paws and felt himself being lifted into the air.

Then he was out of the jar. All covered with jam, he shook himself. Ratigras could not resist laughing. He licked himself to get clean.

4. "Try to run home and tell your mother that I'll go and look for your brothers," whispered Ratigras to Griset.

They both hurried out of the cupboard and the kitchen.

Ratigras soon came to the dining room. A big piece of cheese was lying on a plate on the table. Ratigras had not eaten anything. He approached the cheese and gave it a bite, and another. Nice, this cheese!

5. But what did he see? In the centre there was a hole and in this hole a young mouse was sleeping peacefully! It was Blanquet! He had eaten so much into the cheese that he had formed a kind of tunnel. Full, he laid down inside the cheese and slept as if he was in his hole.

Ratigras was furious.

"You little beast, I can imagine how you would come out of your cheese when they come to eat it. You wouldn't stand a chance".

He punched him with his paw to wake him up.

"Get out! And on the double, you thick head! Go home now and tell your mum that I'll go looking for your brothers".

6. Ratigras went down to the cellar. Fortunately, under the doors there were always cracks that one could get through. It's always handy. A ventilator allowed a little bit of light. And in the centre of the cellar he saw a horrible sight...

His favourite, Clairet, was caught in a trap by the end of his tail. He tried and tried to escape... but in vain, he was a prisoner at the mercy of the prowling cat and the people who were going to come. Clairet saw Ratigras "Uncle, help me..." he said in a dying voice.

There was no time to think twice. Ratigras went towards him and with his sharp teeth cut Clairet's tail right at the spot caught by the trap.

7. The poor mouse gave a pained cry. He licked his bleeding wound.

"It's nothing... it will soon stop... we had to do it" said Ratigras stroking his head.

"Go home, my dear and tell your mother that I'll go and look for your brother."

Ratigras continued to search the house and finally entered the storeroom full of food. It was easy, the door ws left wide open: Someone had just left the room. By this time it was daylight. One inside the room, Ratigras stopped...

8. There sitting still in front of a hole in the wall was the black cat with watchful yellow eyes... in the hole was a trembling mouse waiting for his ennemy to leave. But this cruel cat was not prepared to abandon his prey. He knew that he would eventually get him if he was patient.

This mouse could only be Nigret who loved to come to the storeroom. There was only one way to save him, and it's a very dangerous thing for Ratigras.

He walked to the centre of the room. Yes, he was walking towards the cat as if to defy him. The black cat moved his eyes in between his half-closed eyelids and saw the foolish mouse. How dare he do that? He sprang but Ratigras ran away like a racket with the cat right behind him. It was exactly according to his plan. While running he shouted in a small voice a warning which Nigret understood because his sharp nose could be seen right at the edge of the hole.

9. Feeling sure of himself, Ratigras reached the stairs. He left the steps for the rail, and while his enemy was looking for him below, he shouted from above in the rat-language which cats could not understand saying:

"Get out, Nigret, there is no danger and go home to your mother. All of your brothers are already there."

Then he disappeared through an attic window with a broken pane. Presently he went along the roof and joined his family in the attic.

ater Georges Nigremont
"Story of the Four Little Mice" Ed. LA FARANDOLE

LESSON 25

TITLE: The different parts of a cow.

AIMS: Study the different parts of an animal that everyone is familiar with, such as a cow.

DURATION: Varies depending on whether the class goes to see a cow in a village or a field or studies a cow drawn on the blackboard by the teacher.

MATERIALS: None.

ACTIVITIES: Make a visit or the teacher draws a cow on the blackboard.

GROUP PHASE

The teacher gathers the pupils around the animal or they look at the picture (it should be big enough for everyone to see from their seats) drawn by the teacher.

Questions by the Teacher

The whole class is asked to repeat the correct answers and the teacher notes down all these correct answers on the blackboard.

T - "What can you see in the drawing?" or
"What is this animal?" or
"What is this animal called?"
"What is the name of this animal?"

P1, P2, P3: "A cow, it's a cow"
"We can see a cow"
"This animal is called a cow."

Then we go on with the details:

The teacher points at the different parts of the animal (on the animal itself or on the drawing).

Thus he tries to ask the pupils to name the different parts he is pointing at such as:

- The head: horns
  snout
  eyes
  ears
- The body: back, belly
- The legs: hooves

Each correct answer is written on the blackboard.

INDIVIDUAL PHASE

The teacher points at the different parts of the animal itself or on the picture.

He questions several pupils individually one after the other.

The other pupils may provide the correct answer if the pupils questioned cannot give the right answer.

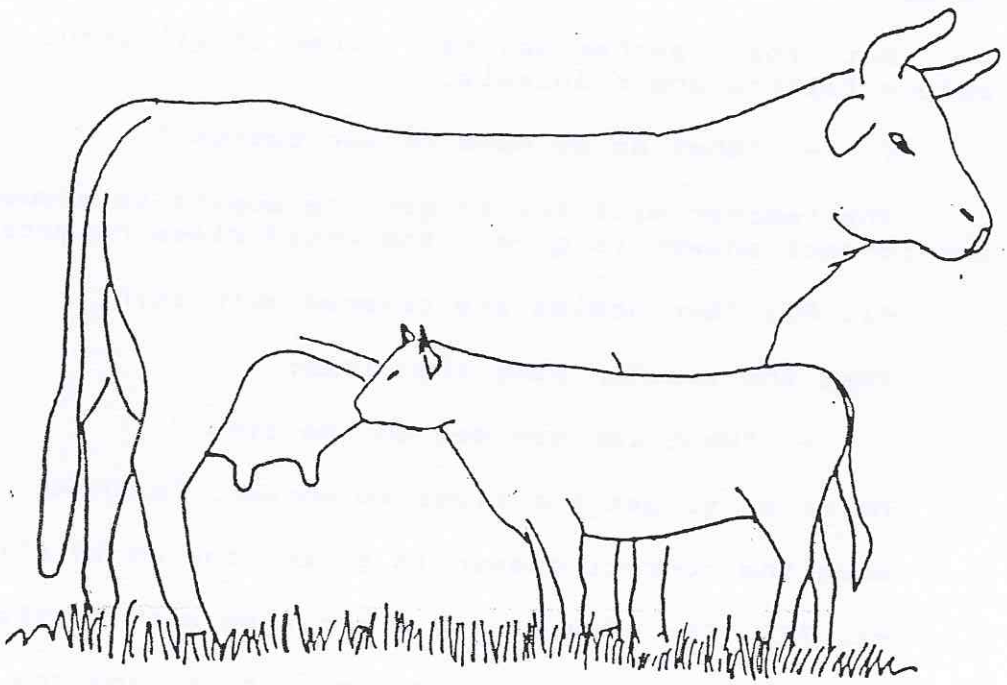
Then the whole class notes down this summary in their books.

If the teacher can arrange for photocopying, he issues each pupil with a drawing of the cow with the different parts of the body named.

SUMMARY

Notes: The teacher may start off by talking about the role played by the dow, its work.

The cow is an animal that is found in VANUATU. It has horns, a snout, and it feeds on grass. It moves around on its 4 legs each of which has a hoof. It can provide milk.



LESSON 26

TITLE: Animals: External appearance: feathers, fur.

AIMS: Study the external appearance of animals starting from these 2 examples: a bird, a cow.
Study the feathers, the fur.

DURATION: 25 minutes.

MATERIALS: None.

ACTIVITIES:

GROUP PHASE

If the teacher can, before the lesson, he should draw a bird with feathers and a cow with fur big enough on the board for the pupils to be able to see from their seats.

But the teacher may talk first of all about man, human being before talking about animals.

T - "What do we have on our bodies?"

The teacher will try to get the pupils to answer: THE SKIN; when the correct answer is given, the whole class repeats the answer.

P1, P2: "Our bodies are covered with skin"

Then the teacher asks the class:

T - "What can you see on the bird?"

He tries to get the class to answer: FEATHERS

When the correct answer is given, the whole class repeats it.

P1, P2: "The bird's body is covered with feathers."

The teacher does the same exercise for the cow.

Each time he points to the feathers and furs.

He asks one pupil at a time to show the feathers and fur to the class.

The same thing applies for the cow and eventually the pupils will get to the fact that:

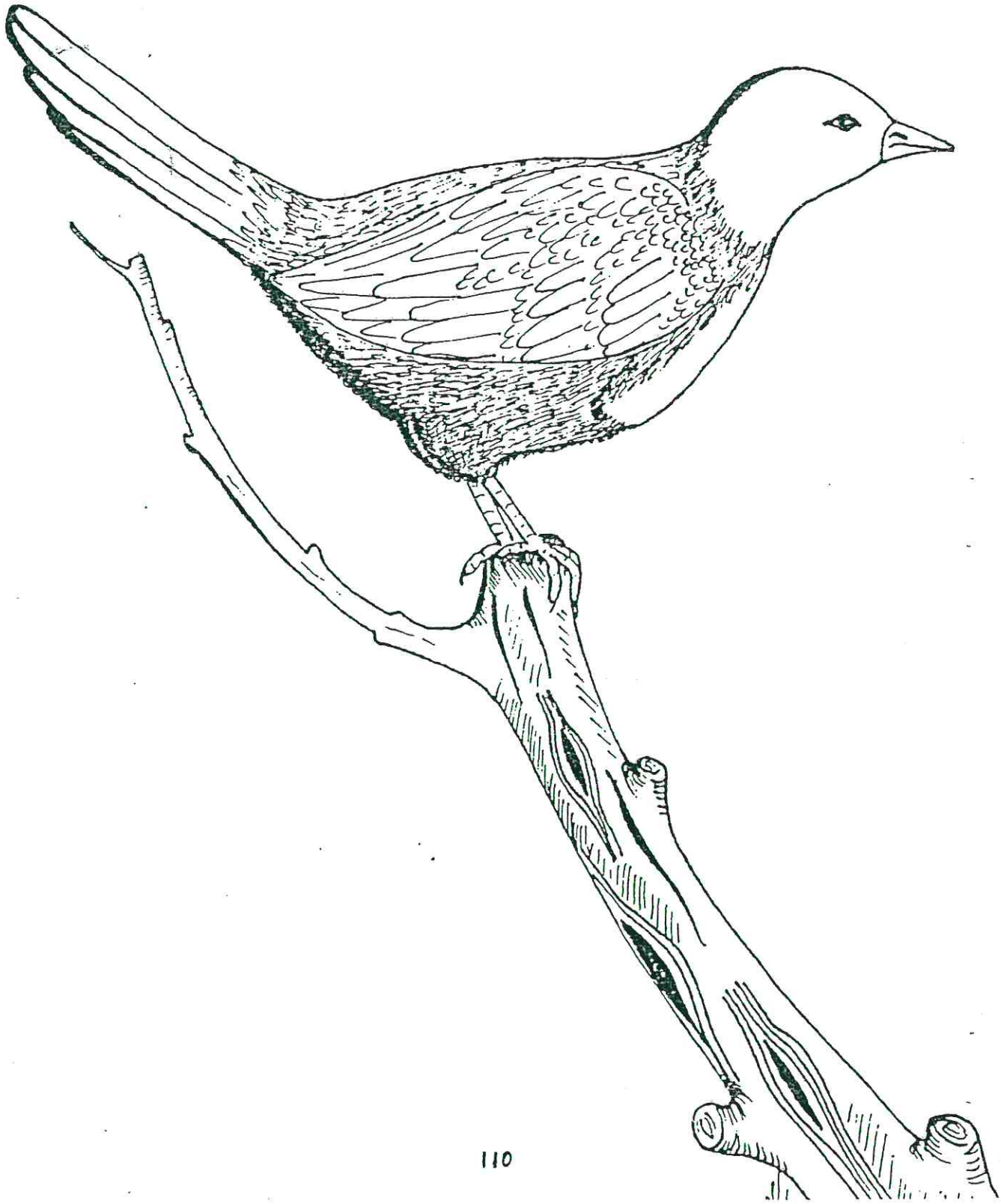
P1, P2... "The body of the cow and the bodies of all terrestrial animals are covered with fur."

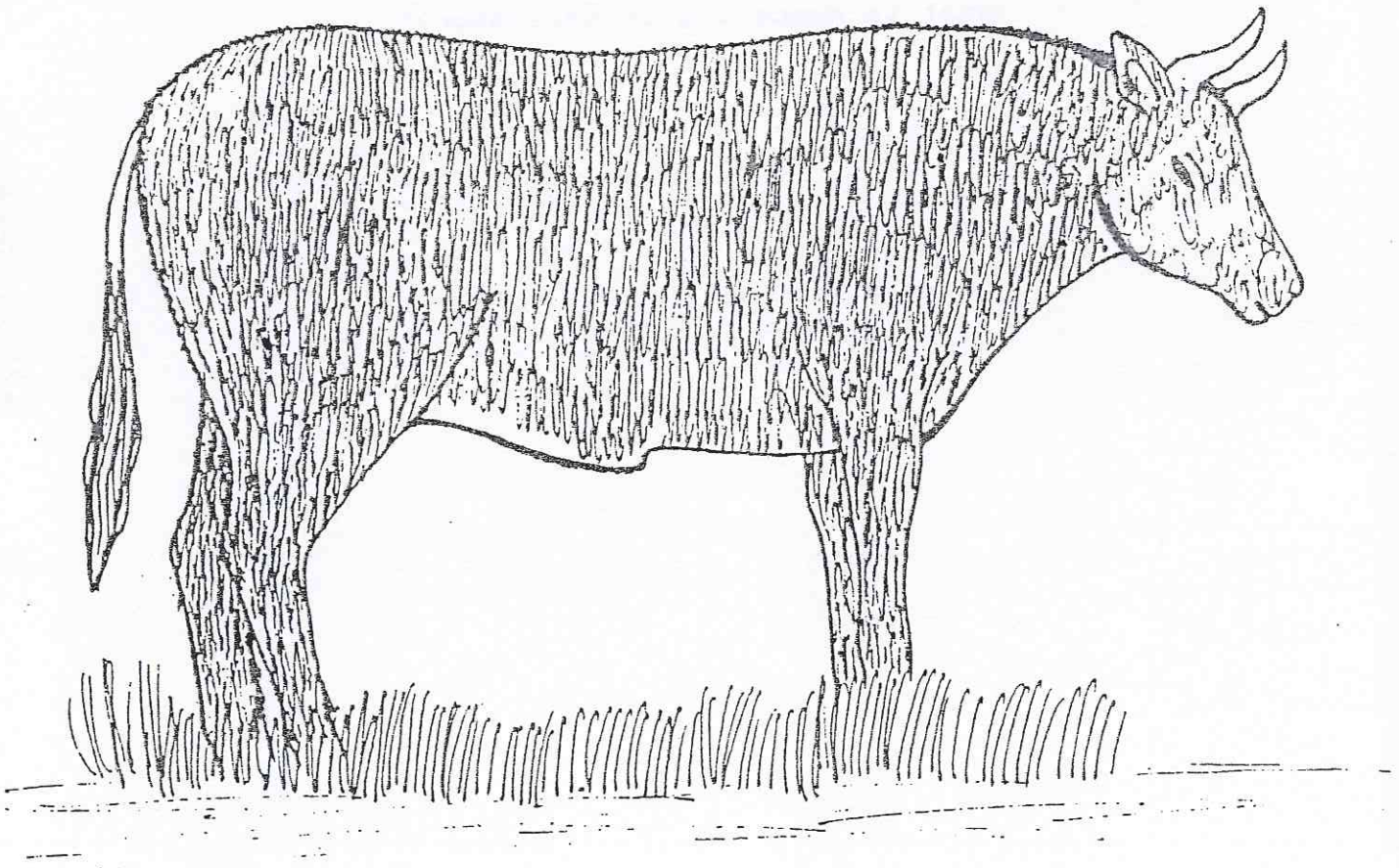
INDIVIDUAL PHASE

The teacher has copied all the correct answers onto the black board.

SUMMARY to be copied into exercise books.

Our body is covered with skin.
The bodies of birds are covered with feathers
The bodies of the cow and other animals such as a cat, dog, horse, pig, goat etc are covered with fur.





LESSON 27

TITLE: "How the flying fox got its wings".
(A custom story from Malakula)

AIMS: As with other stories, talk about animals through legends and stories that the kids love.
This will develop their interest in class, the imagination.

DURATION: 25 minutes.

MATERIALS: None.

ACTIVITIES:

The teacher reads the story aloud and shows the pictures to th class.

If the pupils are interested, questions based on the story coul be asked.

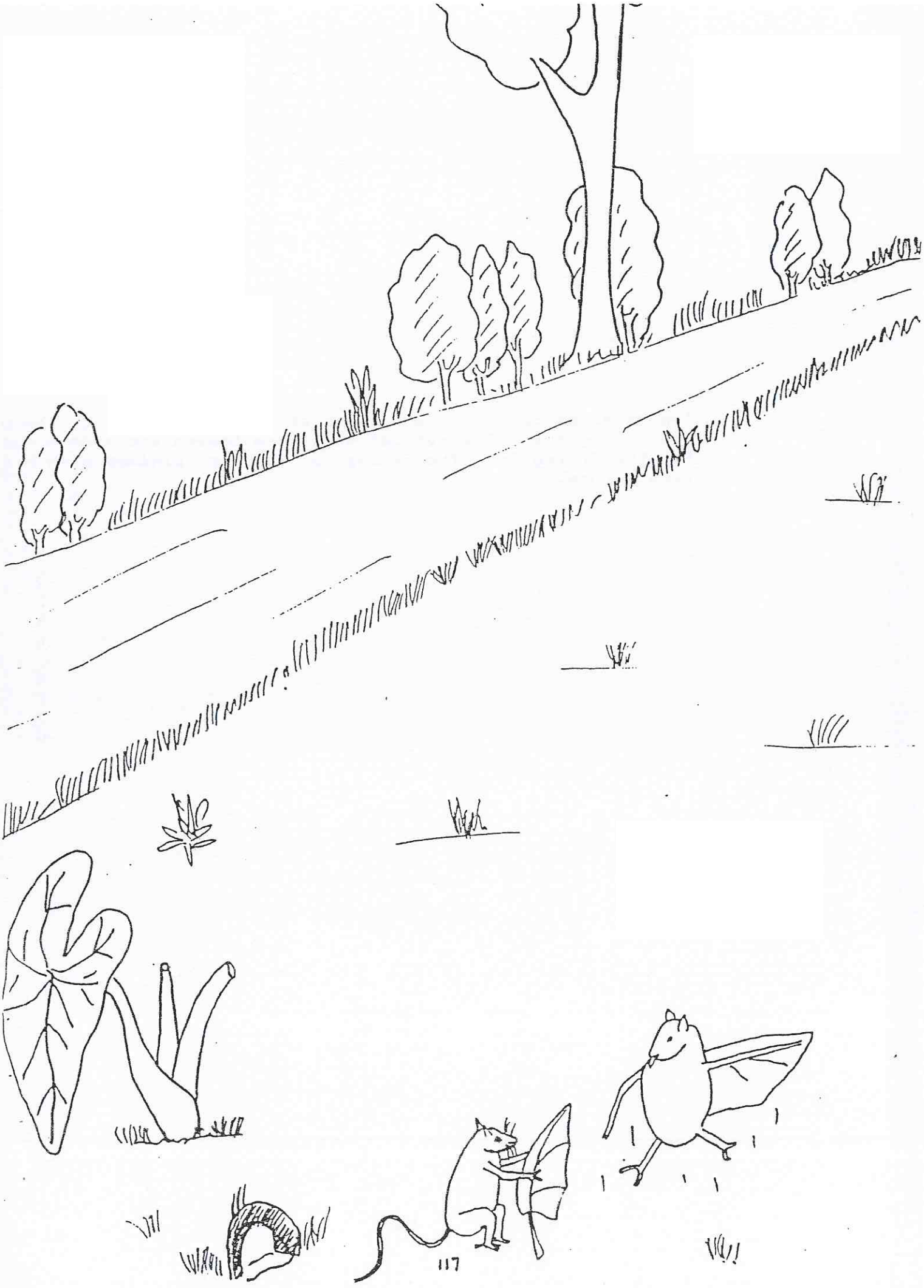
T - "What is happening in this story".

HOW THE FLYING FOX GOT ITS WINGS
(A custom story from Malakula)

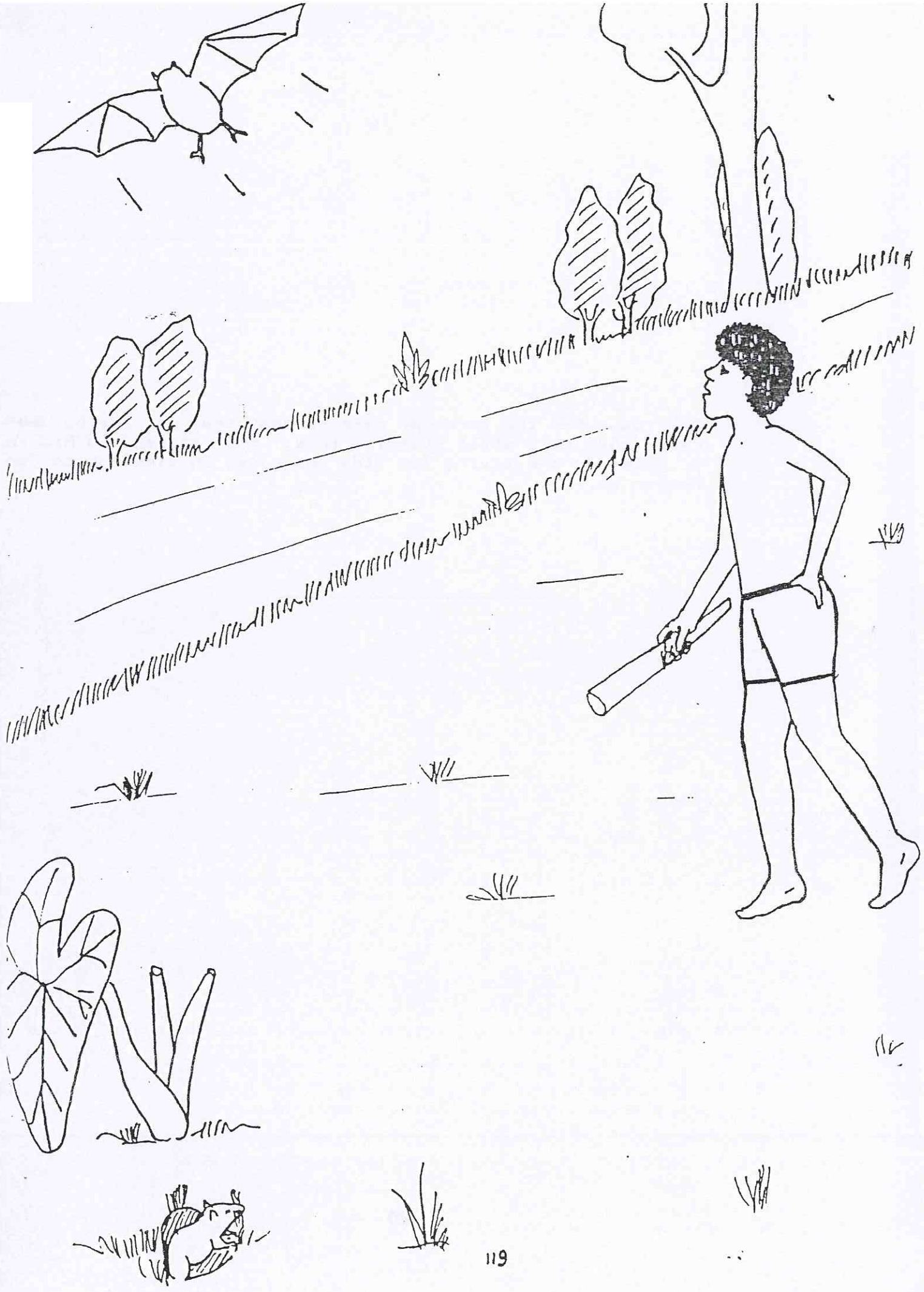
---

1. The flying fox and the rat were long-time good friends. They lived in a garden where all sorts of good food grew. The gardener was very anxious to find who was stealing everything that was growing in his garden.

2) One day he decided to catch the thief. He waited a whole day until the rat and the flying fox arrived. He picked up a stick and started beating them. The rat escaped and hid in a hole but the flying fox did not have anywhere to hide and he received all the beating.



3) The gardener beat him many times so the rat decided to help the flying fox. The rat got some taro leaves and made wings for the flying fox. The flying fox was very pleased with his first wings.



4) One day when the gardener came to beat them up again, because they were still stealing food, the rat ran and hid in a hole and the flying fox flew away just in time not to be beaten up.

LESSON 28

TITLE: Animals' needs - animal care.

AIMS: Try to find out by asking questions and receiving answers the animals' needs and the care they need.

DURATION: 25 minutes.

MATERIALS: None.

ACTIVITIES:

GROUP PHASE

The teacher asks the pupils questions while they remain in their places.

T - "What do we do in the morning before going to school?"
P1, P2 - "We have breakfast"
T - "Do you think animals also eat and drink?"
T - "Do you think animals sleep?"
P1, P2 - "Animals do eat, drink and sleep"
T - "Do you think animals can fall ill or get injured or not?"
P1, P2 - "Animals can fall ill and get injured."

The teacher must try to emphasize to the pupils that in the bush the adult animals help the young ones to survive.

Animals in the village could be helped by people in the village.

The teacher may conduct this part of the lesson according to the level of the class.

INDIVIDUAL PHASE

To be copied into exercise books

Like human beings, animals have needs: they must eat, drink and sleep.

They can fall ill or get injured.

Animals have needs

Sometimes they must be nursed too.

In nature young animals learn from their parents.

LESSON 29

TITLE: Animal movements

AIMS: Try to reveal to pupils in Class 2 the method of movement for these 3 main groups of animals:

- terrestrial animals
- birds
- fish

DURATION: 25 minutes.

MATERIALS: None.

ACTIVITIES:

GROUP PHASE

The teacher and the class try to name the different methods of movement for these 3 main groups of animals:

- terrestrial animals
- birds
- fish

The correct answers are repeated by the whole class and copied on the blackboard.

Working with questions and answers.

Starting point: Drawings

T - "What can you see in Drawing I?"
"What is this animal?"
"What is its name?"
P1, P2 - "It's a bird"
T - "How does it move from one tree to another?"
P1, P2 - "It flies"
T - "What does it usee to fly with?"
"How does the bird fly?"
P1, P2 - "With its wings"
"The bird flies with its wings"

The same with Drawing II

The teacher asks how the animals in Drawing II move around.

He asks the pupils how the fish lives, where it lives, and how it moves around.

The correct answers are be repeated by the whole class.

The correct answers are copied onto the blackboard and read out by the pupils.

INDIVIDUAL PHASE

The teacher questions the pupils individually.

1. How does the horse, goat, cow move around?
2. How does the flying fox moves around?
3. How does the mullet moves around?

SUMMARY

(To be copied into exercise books)

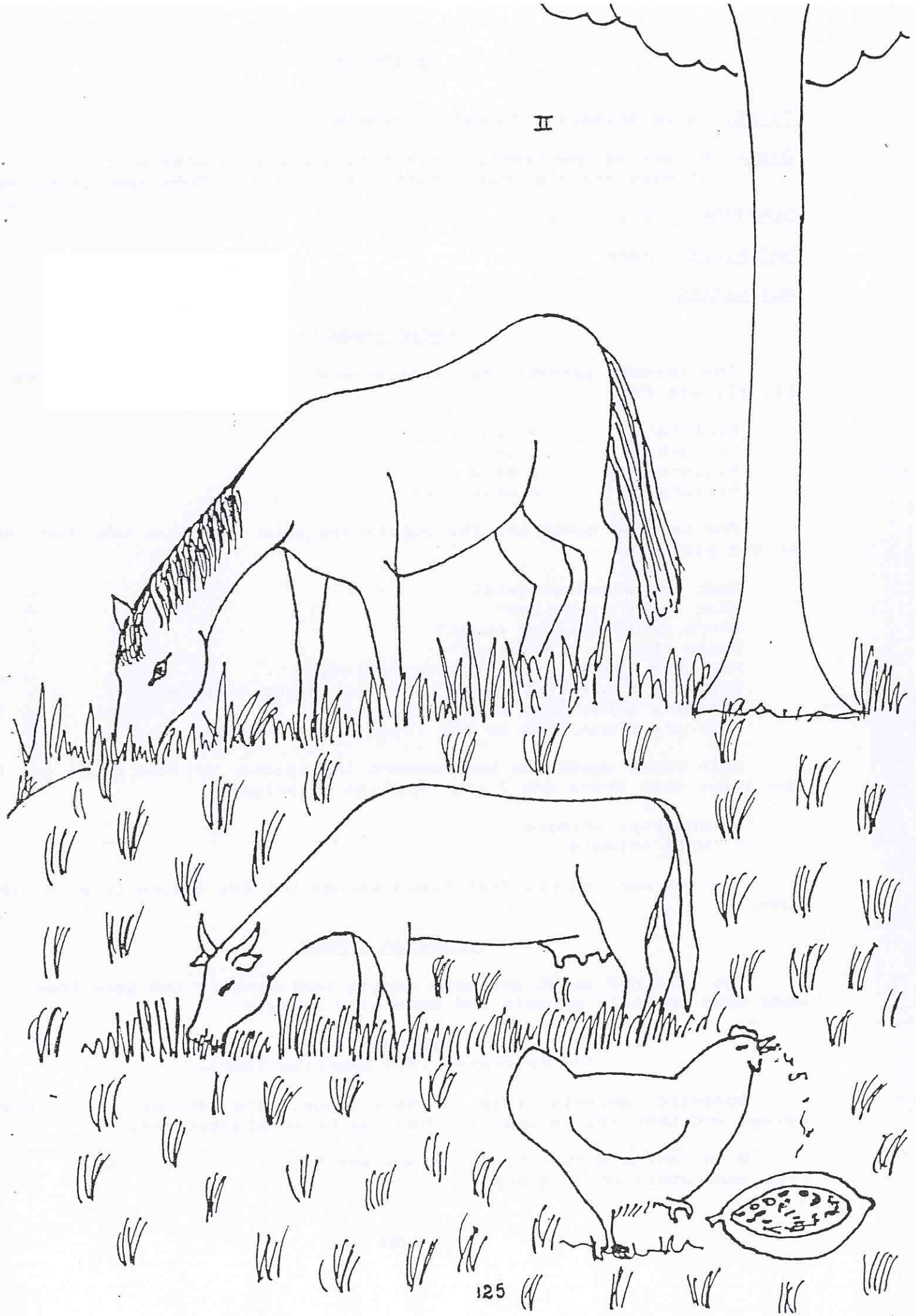
Terrestrial animals move around with their four legs. They walk and run.

Fish move around in the water with their fins. They swim.

Birds move around in the air with their wings. They fly.


I

II



LESSON 30

TITLE: Wild animals - domestic animals

AIMS: By asking questions, explain to the pupils what wild animals are and what domestic animals are. Show them pictures.

DURATION: 25 minutes.

MATERIALS: None.

ACTIVITIES:

GROUP PHASE

The teacher gathers the class around him to show them pictures I II, III and IV.

Picture I : a dog
Picture II : a cat
Picture III : a bird
Picture IV : a wild pig.

The teacher questions the pupils and asks them what they can se in the pictures.

What are these animals?
What are they called?
Where could they be found?
Could they be classified?
What are those living in the village?
What are those that could be found in the village?
What are those that live in the bush?
What are those that do not live in the village?

With these questions and answers the teacher triesto point out t the class that there are 2 big families of animals:

- domestic animals
- wild animals

The former do not fear human beings but the second live in th bush.

INDIVIDUAL PHASE

The teacher questions some pupils individually and asks them t name some domestic animals and some wild animals.

SUMMARY

(To be copied into exercise books)

Domestic animals live in the village, they do not fear humar beings and they may be useful. They may be in plantations.

Wild animals fear human beings and they live in the bush. The live separately or in groups.

TEST EXERCISE

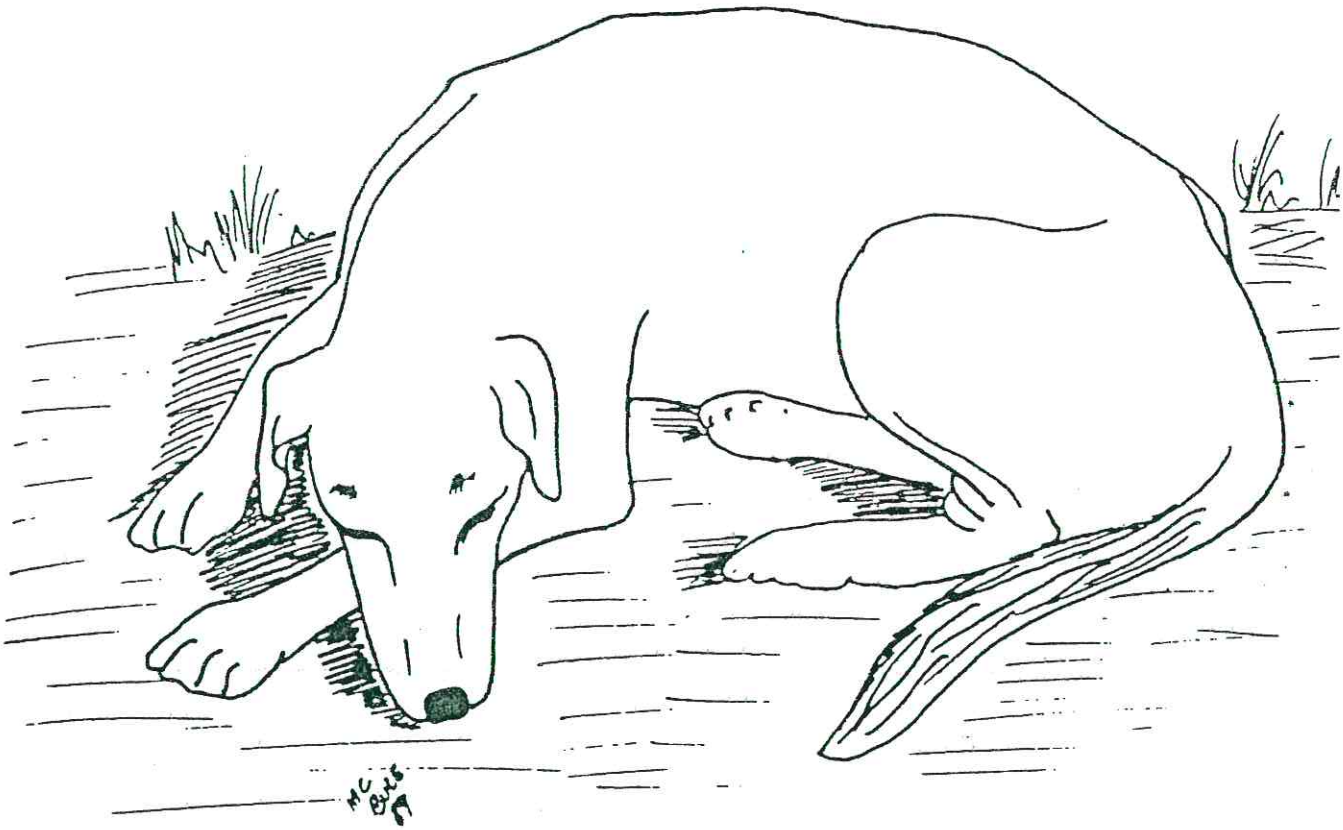
(To be done in exercise books)

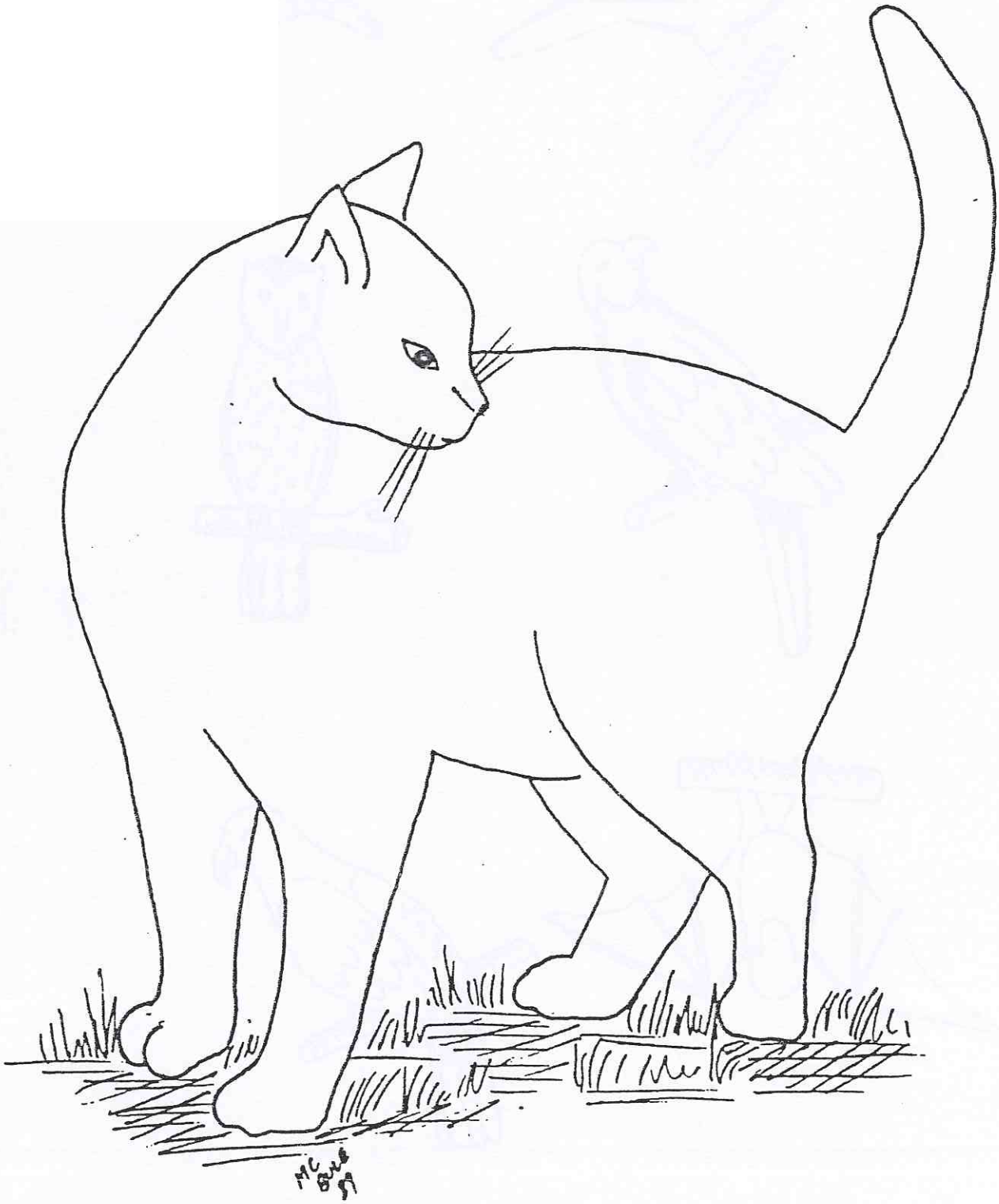
CAT	X		
WILD PIG	X	X	DOMESTIC ANIMALS
DOG	X		
FLYING FOX	X		
HEN	X	X	WILD ANIMALS
ROOSTER	X		

Connect the crosses to the correct grouping.

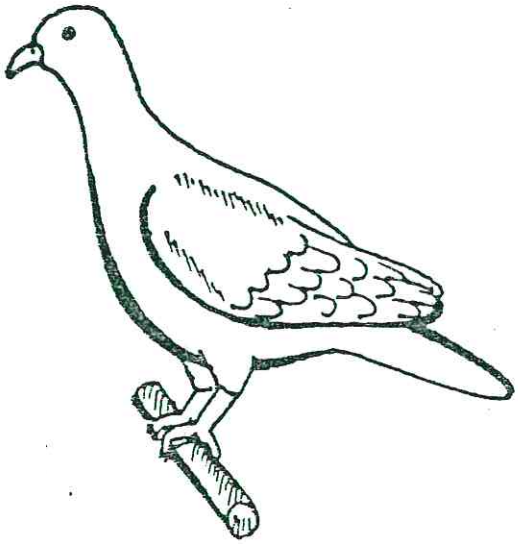
Some animals may be both wild and domestic.

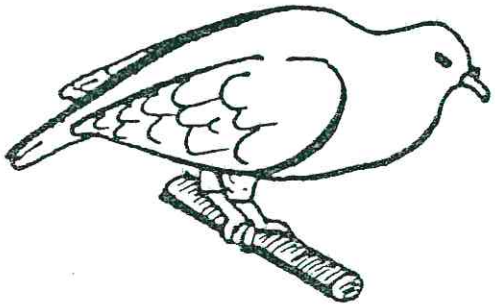
I

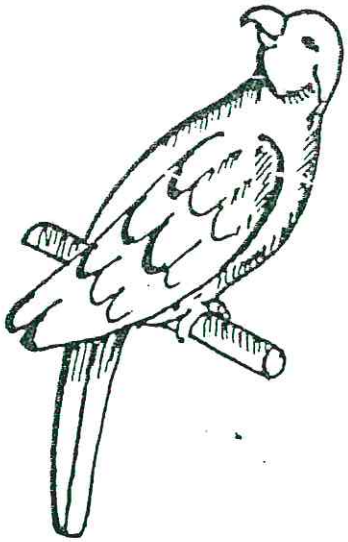


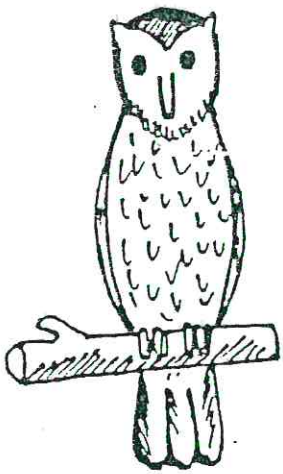


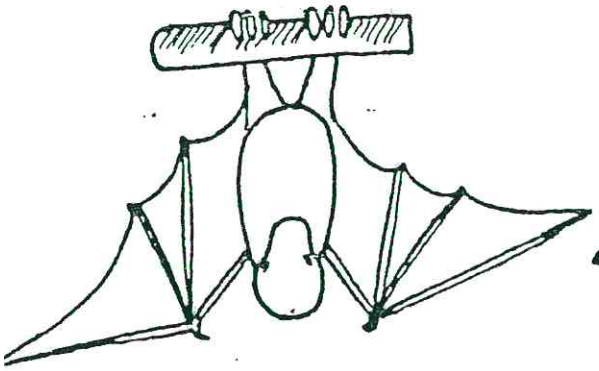
III

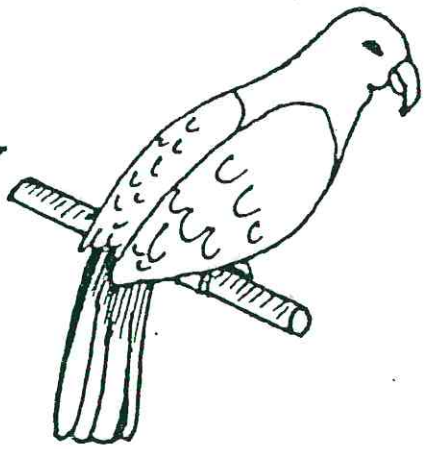












LESSON 31

TITLE: Living by the sea shore.

AIMS: Using documents provided to the teacher, to give information which the teacher uses in accordance with his environment and his class.

DURATION: Indefinite.

MATERIALS: None.

ACTIVITIES:

GROUP PHASE

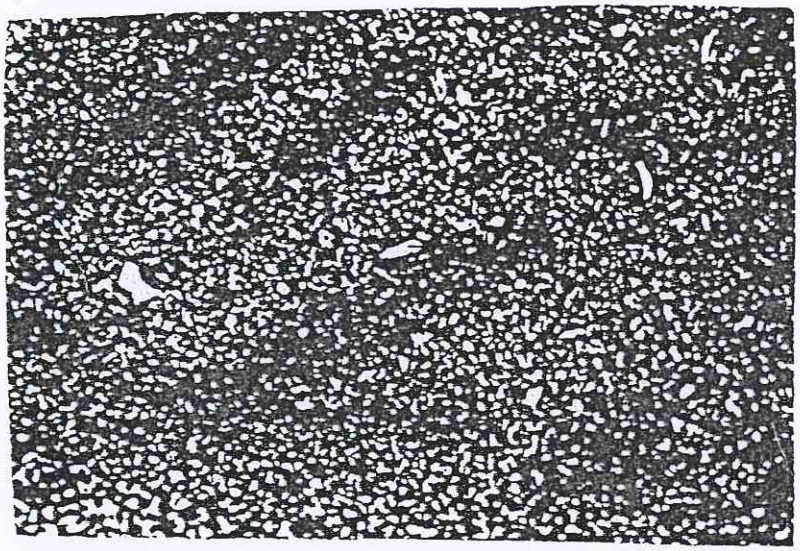
The teacher studies the documents and uses them in class as he wishes.

These documents are mainly intended for his personal information.

ARRIVING AT THE COAST

SAND ON THE BEACH

To get to the sea you have to jump from rock to rock or walk across a beach of sand or pebbles. Where did this sand, which feels so nice under foot, come from? What is its history?



Sand enlarged several times.

Sand is made up of a mixture of shell debris, the quantity varying from beach to beach, grains of silica and sometimes also various other components such as tiny pieces of wood. Next to cliffs there are also pieces of the rock it is made of.

- The shells provided shelter for animals which lived in the sea;
- The wood comes from driftwood gradually decomposed by the sea, or from plants scattered by the wind;
- The grains of silica are the most resistant elements of some rocks, such as granite, from which they have been released by the action of frost and extreme temperatures.

UNDER THE WATER

Even today the great depths retain the mysteries of their dark silence, supported by legends of underwater monsters or by the novels of Jules Verne.

However, for about fifty years, thanks to submarines, bathyscaphes and oceanographic vessels, underwater exploration has been providing us with important information concerning life in the oceans.

The areas of less deep water, which are illuminated by sunlight and teeming with life, form a long, mobile fringe which is more familiar to us where the land dips beneath the foaming waves. This is the shoreline, a kingdom with frontiers set by the tide, with its flora and fauna which we aim to discover through this period of "truancy".

DISCOVERIES AT LOW TIDE

You have decided to go fishing tomorrow at low tide. But, first of all:

A few precautions

- "Shoes:"

By walking barefoot on the rocks or on sharp shells, you risk cutting yourself, and polluted water makes wounds slow to heal. So wear boots, plastic shoes or old sandals. The thing is to ensure that you do not hurt yourself.

- Clothes:

The spray and sea breezes may chill you and the sunshine may burn you, even if the sky is cloudy. For these reasons you should cover your upper body an old sweater or something light and waterproof over your swimming costume will go the trick.

- Equipment:

This varies depending on what you want to do, so look at the subject you are interested in.

- Times

You have found out the time of the low tide. This is the time when the ocean has retreated to its lowest point; it is also the time when you will make the most numerous and richest discoveries. So you should be by the sea about one hour before the time shown on the tide chart. Since the sea will remain slack for a few minutes before rising again over a period of six hours, you will be there at the best time for fishing.

E.g.: If you have read on the tide chart that low tide is at 10.30, get to the sea at about 09.00 and then go gradually inland, fishing all the way, starting at 10.30. Don't let the flow surprise you. Remember that some lower-lying areas will became covered with water very quickly.

What to fish? How to fish?

- Shell-fish

These are plentiful and varied. If you want to be able to identify them, turn to the identification guide: "Animals by the sea shore."

We only envisage fishing for the most common edible shell-fish; when fishing you must respect certain rules:

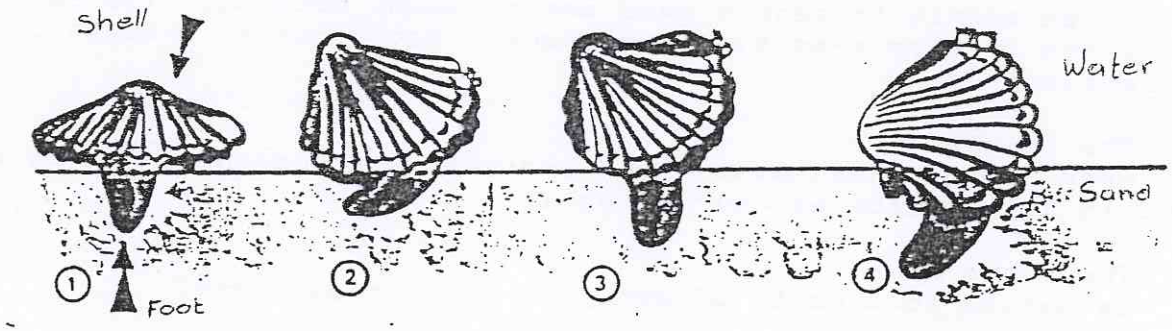
- each time you turn over a stone, put it back as you found it. Otherwise, you will destroy all the fauna it was sheltering or which were attached to it. Even if these small animals are of no direct interest to you, remember that they may form part of the diet of those you are looking for. You have no right to get rid of them.

Those which are buried in the sand

- How to locate them?

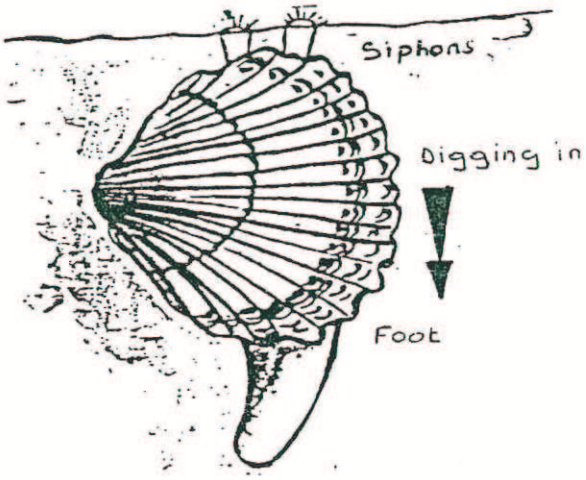
They dig themselves into the sand or the mud by moving their feet, which are like axeheads (the foot is the leathery muscular tongue situated in the middle of the shell).

Movements made by a shell-fish when digging into the sand (1-4).



- The shell-fish buried in the sand has one or two tubes, called siphons, for extracting nutrients from the sea-water. They lie flush with the surface of the sand (you may observe them in the marine aquarium).

So you should look in the sand at low tide for these little holes which betray the presence of shell-fish. Then scoop them out with a large spoon or a hoe (do not use a spade).



- The pullet or carpet shell :
lives mainly in pebbly sand and on muddy bottoms. You can locate it by the 2 holes made by its siphons. Scoop out at a depth of about ten centimetres.

- The cockle :
here too, 2 adjacent holes indicate its presence. It is to be found in large colonies near estuaries.

- The venus clam :
is buried to a depth of about 20 cm in clean sand.

- The donax :
is buried in the sand at a shallow depth. A small furrow in the sand gives it away. Treading on the wet sand causes it to come out. This shell-fish is less sought after than the preceding ones.

- The sand gaper :
is buried deep in the sand or mud in estuaries. Its siphon can often be seen on the surface.

- The solen or razor shell :
lives buried at a great depth (about 50cm). Its 2 adjacent siphons trace a figure of 8 in the sand. If you see this figure of 8, drop a pinch of coarse salt on it. The animal will come out and you have to catch it as soon as it appears.

You can also catch it with a metal umbrella rib or a long piece of wire shaped like a harpoon at the end ; you thread this wire into a hole, the animal quickly closes its shell and you just pull to get the "razor" out. It obviously owes its name to its shape.

THE TIDES

JULY

DATE	COEFFICIENT		HIGH TIDE		LOW TIDE	
	Morning	Evening	Morning	Evening	Morning	Evening
1 F FM	97	100	4 33	16 50	10 34	23 00
2 S	101	102	5 17	17 36	11 22	23 50
3 S	101	99	6 02	18 19	.. ..	12 10
4 M	96	92	6 45	19 03	0 37	12 58
5 T	87	82	7 25	19 46	1 23	1 47
6 W	76	70	8 06	20 26	2 10	14 35
7 T	65	59	8 44	21 17	3 00	15 26
8 F LQ	55	50	10 41	22 45	3 52	16 20
9 S	47	45	.. ..	12 11	4 48	17 22
10 S	44	..	0 23	13 07	5 51	18 30
11 M	44	46	1 19	13 52	6 56	19 35
12 T	48	51	2 05	14 33	7 56	20 30
13 W	54	58	2 47	15 07	8 46	21 15
14 T	61	65	3 26	15 44	9 27	21 55
15 F	69	72	4 02	16 17	10 04	22 31
16 S NM	75	78	4 37	16 50	10 41	23 06
17 S	80	82	5 10	17 22	11 15	23 43
18 M	83	84	5 44	15 55	11 53	.. ..
19 T	84	83	6 18	18 30	0 18	12 31
20 W	82	81	6 55	19 05	0 57	13 09
21 T	78	76	7 36	19 45	1 37	13 52
22 F	73	70	8 23	20 34	2 18	14 38
23 S FQ	66	63	9 27	21 42	3 05	15 28
24 S	60	58	10 49	23 25	4 00	16 26
25 M	57	..	.. ..	12 11	5 03	17 35
26 T	57	59	0 48	13 21	6 15	18 49
27 W	63	67	1 55	14 18	7 28	20 00
28 T	73	78	2 52	15 08	8 33	21 02
29 F	84	89	3 41	15 55	9 29	21 57
30 S FM	94	98	4 23	16 38	10 20	22 48
31 S	100	102	5 03	17 18	11 08	23 34

Let us look at 6 and 7 July 1977 in Vendée:

	Coefficient		High Tide		Low Tide	
Date	Morning	Evening	Morning	Evening	Morning	Evenin
Wednesday 6	76	70	8 06	20 26	2 10	14 35
Thursday 7	65	59	8 44	21 17	3 00	15 26

We notice that:

- a low tide follows a high tide and so on.
- on average almost 6 hours separates low tide from high tide.
- on Wednesday 6 the progression from morning to evening was:
  - low tide : 0210
  - high tide : 0806
  - low tide : 1435
  - high tide : 2026
- there is a coefficient for each tide: 76 for Wednesday morning and 70 for Wednesday evening.
- this tide coefficient gives some idea of the strength of the tide. It varies between 20 (the weakest tide observed) and 120 (the strongest tide possible);
- for fishing at low tide it is best to choose a day when the tide has a high coefficient, which means that the sea retreats a very long way.

If we look at the progression of low tides and high tides on Wednesday 6 and Thursday 7, we find that:

- the sea advances onto the beach during the high tide (this is the flow) up until the high tide time. It then remains slack for a few minutes (it neither advances further nor retreats).
- then the sea retreats for a little over 6 hours to its lowest level (the low tide time) where it again remains slack for a few minutes.

Then it flows again and so on.

Thus, the four tides took about 24 hours 50 minutes, which corresponds to the time taken for the moon to reappear at the same point on the horizon from one day to the next: thus, the tides depend on the movement of the moon, and also on the sun.

The strong tides (those during the month with a high coefficient - 7 and 21 July on this chart) are 14 days apart; this duration relates to the movement of the moon round the Earth.

. on your chart, these dates correspond to a full moon.

Another feature sometimes found on tide charts is the range:

. the range is the difference between the levels of the low tide and the high tide at a given location; you can find signs of this at ports on the tide gauges.

LESSON 32

TITLE: In the river - in the sea.

AIMS: To make a list of river and sea fish known to the pupils.

DURATION:

MATERIALS: None.

ACTIVITIES:

GROUP PHASE

The teacher shows drawings I, II and III to the pupils gathers round him.

What can we see in drawing I?

Do you recognise any of the fish in drawing II?

Where do the fish in drawing III live?

The teacher writes correct answers on the blackboard and th whole class reads them.

Then the whole class classifies fish into river fish or sea fish

INDIVIDUAL PHASE

The teacher questions a few pupils individually

T - "Peter, give me the name of a river fish."

The teacher asks this several times.

The class may correct any mistakes.

SUMMARY
to be copied into exercise books

The most common river fish are:
the carp, the eel, the fresh-water prawn and the spined loach.

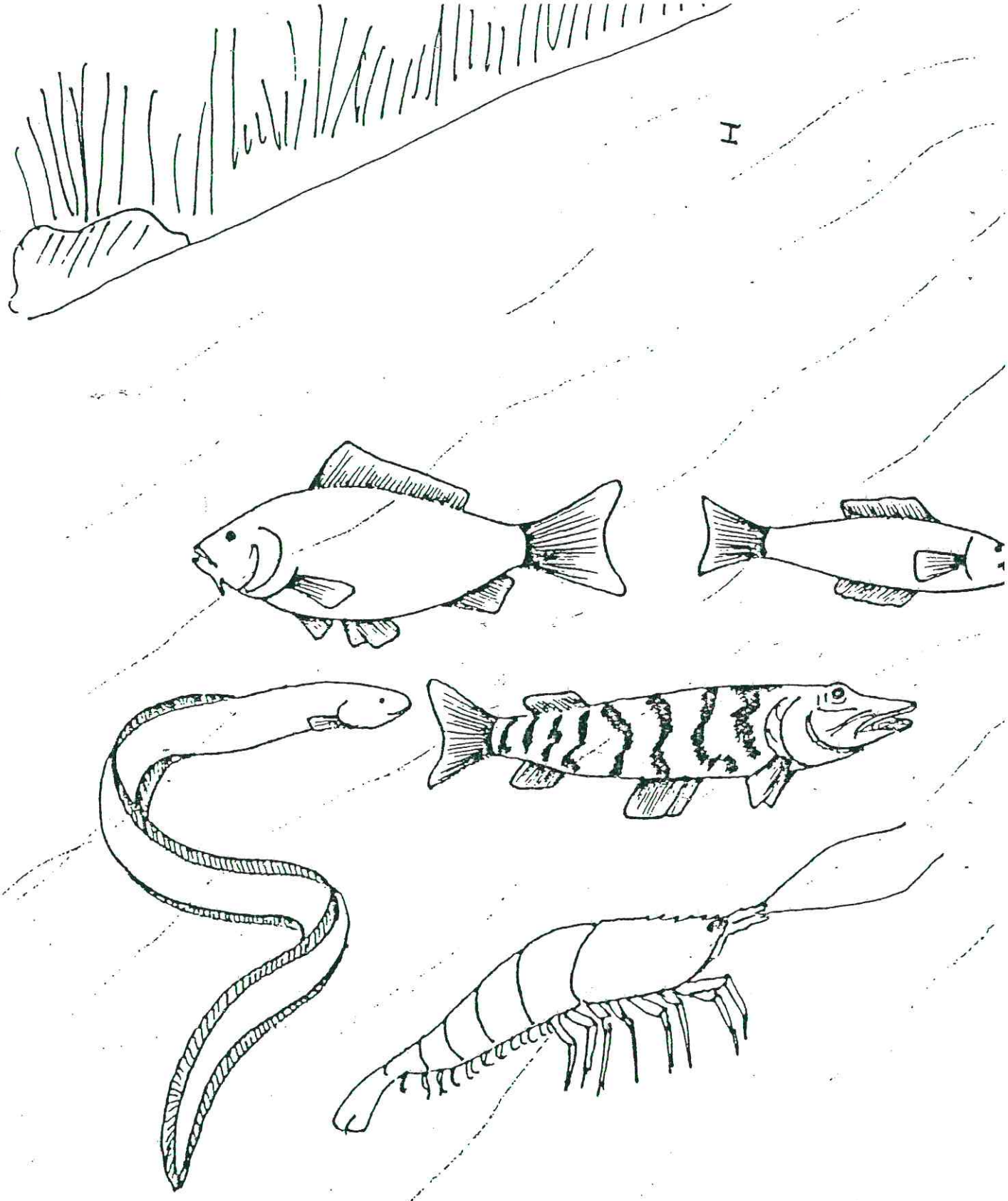
The most common sea fish are:
the mullet, the cavally, the picot, the triggerfish, the surgeon-fish, the shark, the tuna and the bonito.

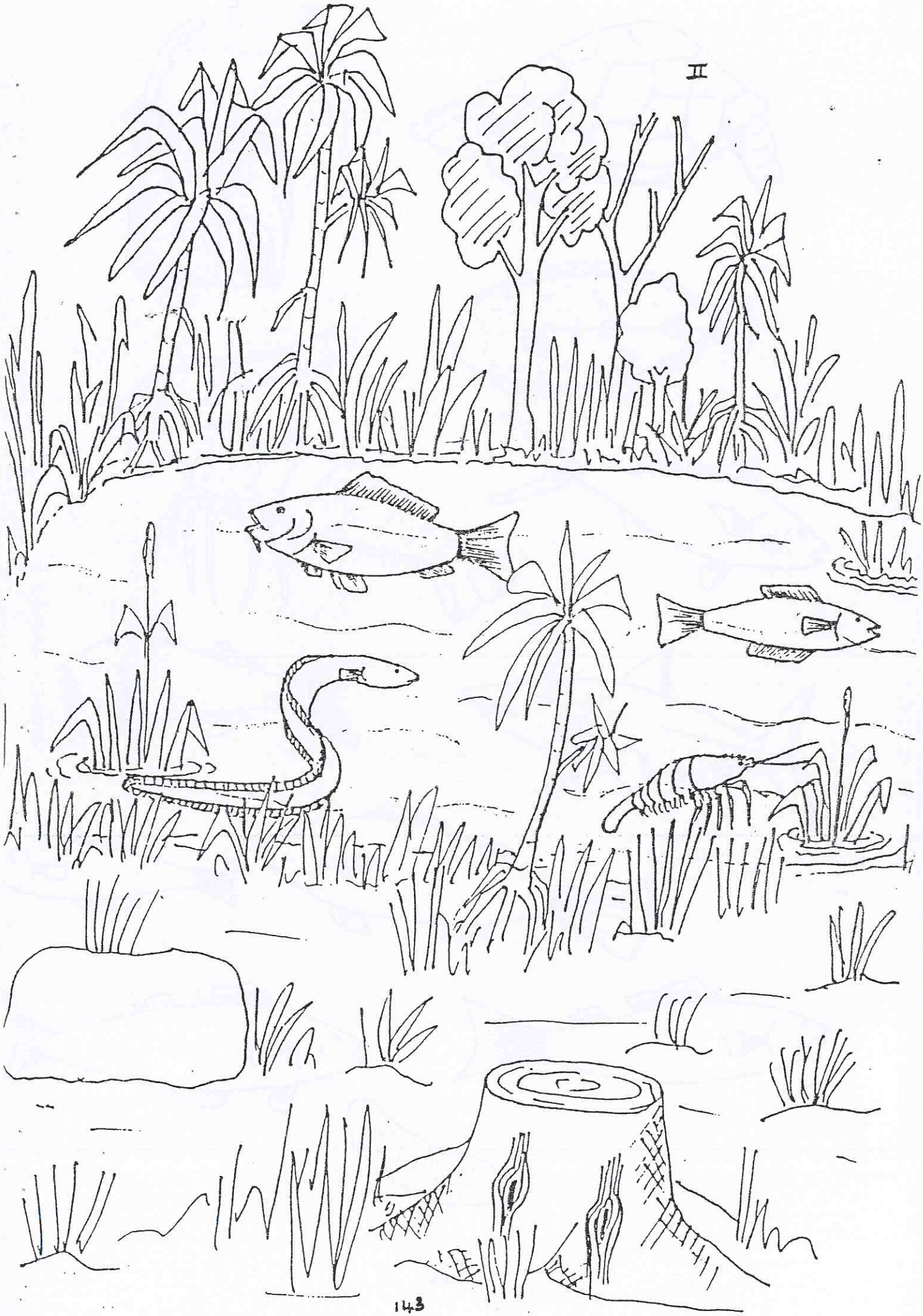
EXERCISE

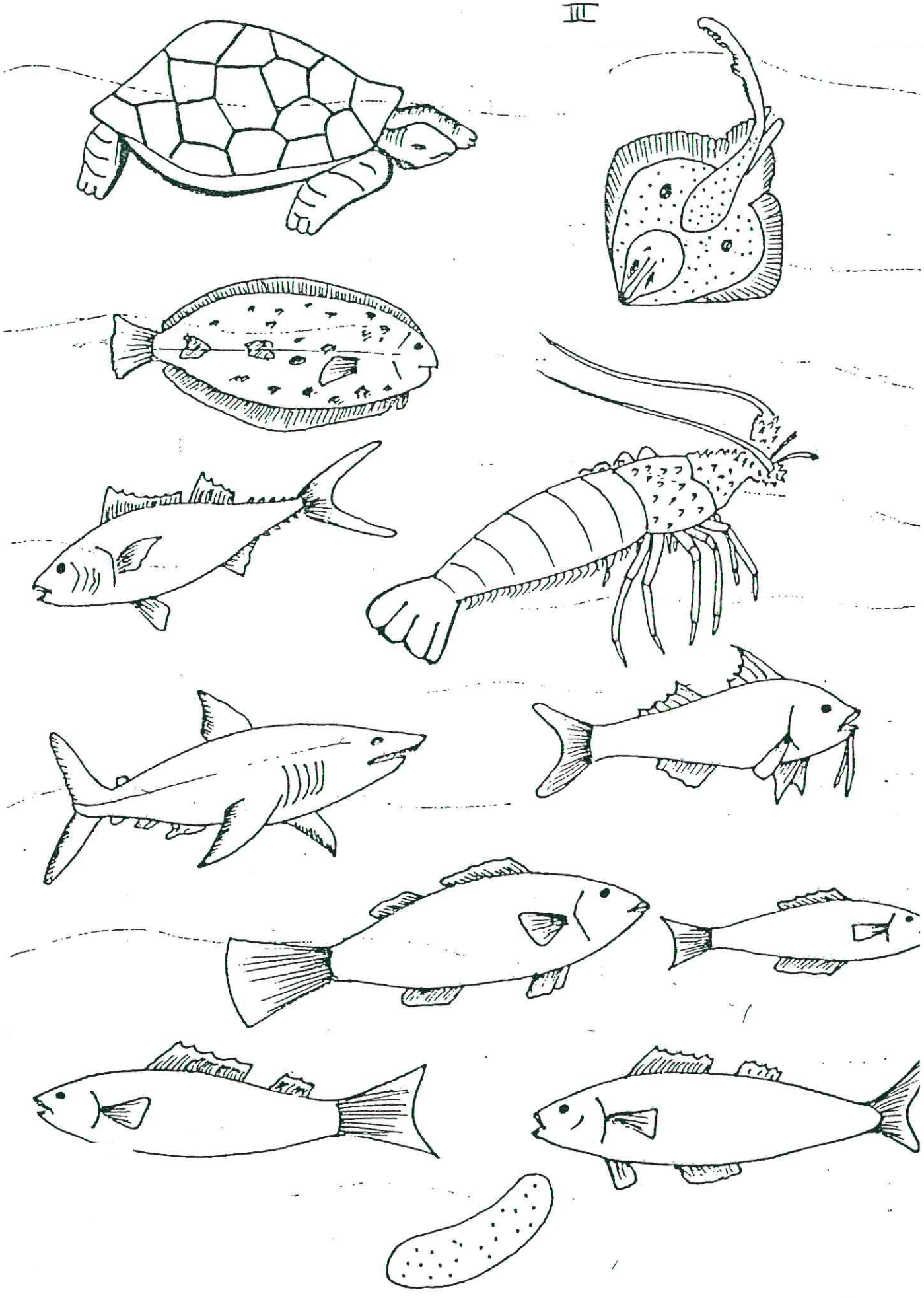
Do the exercise in your exercise book.

Say whether the following are sea or river fish:

mullet	X		
fresh-water prawn	X	X	sea
cavally	X		
tuna	X		
carp	X		
bonito	X	X	river
eel	X		




II



LESSON 33

TITLE: Fishing stories.

AIMS: Fishing through stories.

DURATION: Variable.

MATERIALS: None.

ACTIVITIES:

The teacher reads out loud the two stories written by ni-Vanuatu teachers, Eunice Simbolo and Tanino Callisto.

You can make comments and discuss the stories, do drawings based on them or even attempt to write other fishing stories.

DADDY WENT FISHING

Eunice Simbolo

Daddy went fishing.
He left his canoe on the reef.

He went to look for a good place to fish.

The wind started to blow.

A few big waves washed over the reef.
When Daddy got back, his canoe had disappeared.

He looked around for it and
realised that the canoe had been carried away.

That's why he had to swim home.

THE CONCH AND THE NAUTILUS

Tanino Callisto

Once upon a time
there were two very good friends,
the conch and the nautilus.

At that time
the nautilus was the same shape
as the conch.
They both had long shells.

One day there was a great feast
for all the shell-fish in the sea.
The conch and the nautilus
went to get ready.

The nautilus said to the conch:
"You paint me first".
And the conch chose a few pretty colours
and painted the nautilus
white, red, white, red
and black.

When the nautilus saw his reflection
in the water
he thought he looked very nice.
Then the conch said to the nautilus:
"Now it's your turn to paint me."
But the nautilus chose gloomy colours,
dull browns and reds,
and smeared them all over the conch.

When the conch saw his reflection
in the water
he was not at all pleased.
He said: "Nautilus, I painted you nicely! But you haven't painted me very well at all!
You'll have to go to the feast by yourself.
I can't go looking like this,
you've disfigured me.
But, you mark my words,
one day chiefs will use me
to make them famous."

That's why the nautilus went
to the great shell-fish feast alone.
The conch stayed behind
and cried so much
that he died of sorrow.

Some time later the empty conch shell
was washed up on the beach.

A man found it
and gave it
to the village chief.

One day the nautilus was floating
beneath the surface of the water
when he heard a loud noise.
It was so loud
that it made him feel ill.
It was so loud that it made him roll up
his shell into the shape it still has today.

Where did this sound come from?
It came from the shell of his friend, the conch,
which the villages blew into
when they were carrying their chief around.

LESSON 34

TITLE: Fish: external appearance: scales.

AIMS: To study and discover what fish look like, how they are made, their external appearance and their scales.

DURATION: 25 minutes.

MATERIALS: Bring to the class a fresh fish with its scales on.

ACTIVITIES:

GROUP PHASE

The teacher gathers the children round a table, where the fish is placed.

Then, as usual with the question and answer system, the pupils explain their observations.

T - "What have we put on the table?"
"What is it?"
"Where does it live?"
"How is it made?"
"Does it have feathers?"
"Does it have fur?"
"Does it have hide?"

Notes for the teacher: We should remember that Year 2, like Year 1, is a year for making pupils aware of the language of education.

The children discover the language through knowledge and this is why the teacher often works with questions and answers, getting the class to participate so that oral expression is used as often as possible, both in the group and individually.

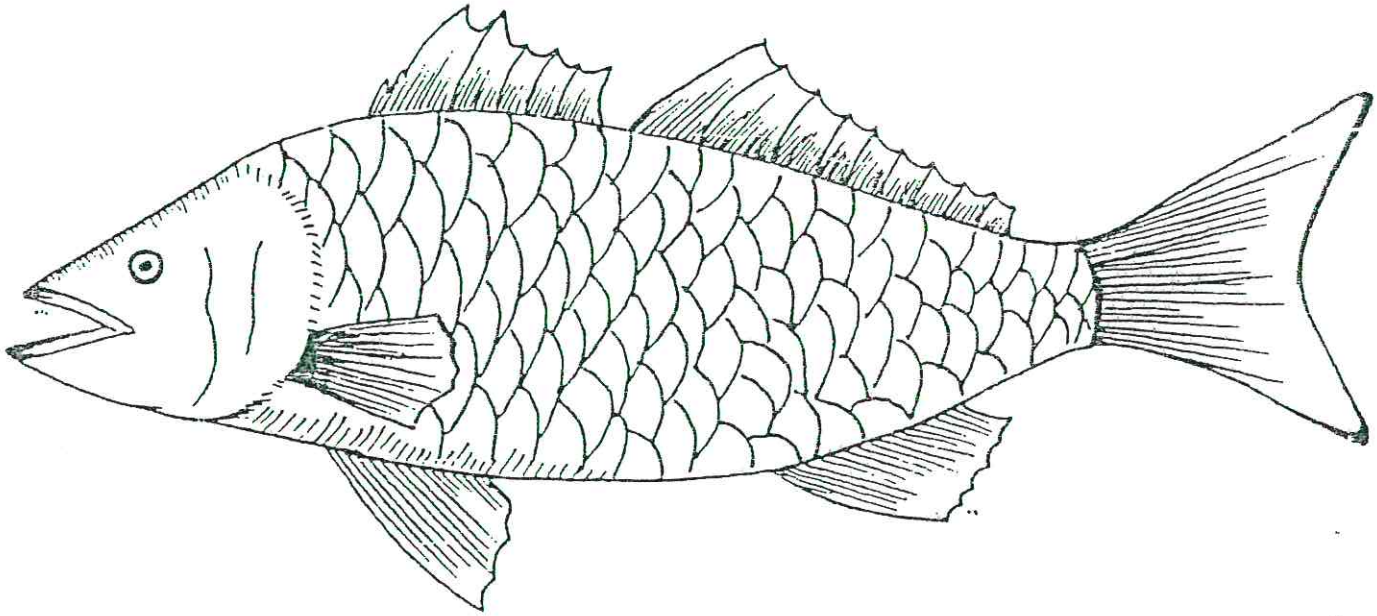
Correct answers are repeated by the whole class.

INDIVIDUAL PHASE

SUMMARY

to be copied into exercise books

Fish live in water. Their bodies are sometimes covered with scales (the size of the scales varies according to the fish). Some fish, like sharks, have a sort of skin. All fish have fins.



LESSON 35

TITLE: "The story of the little blue fish".

AIMS: At the end of the year the children discover a story for the pleasure of hearing the legend.

DURATION: Variable.

MATERIALS: None.

ACTIVITIES:

This is not a lesson, just a story for the class to discover.

Some children will know the story from having heard it on a schools radio broadcast on Radio Vanuatu.

The teacher is free to present the story as he wishes: all in one go, in several installments, out loud, or the pupils reading it to themselves.

- STORY OF THE LITTLE BLUE FISH -

(Story from Western Samoa)

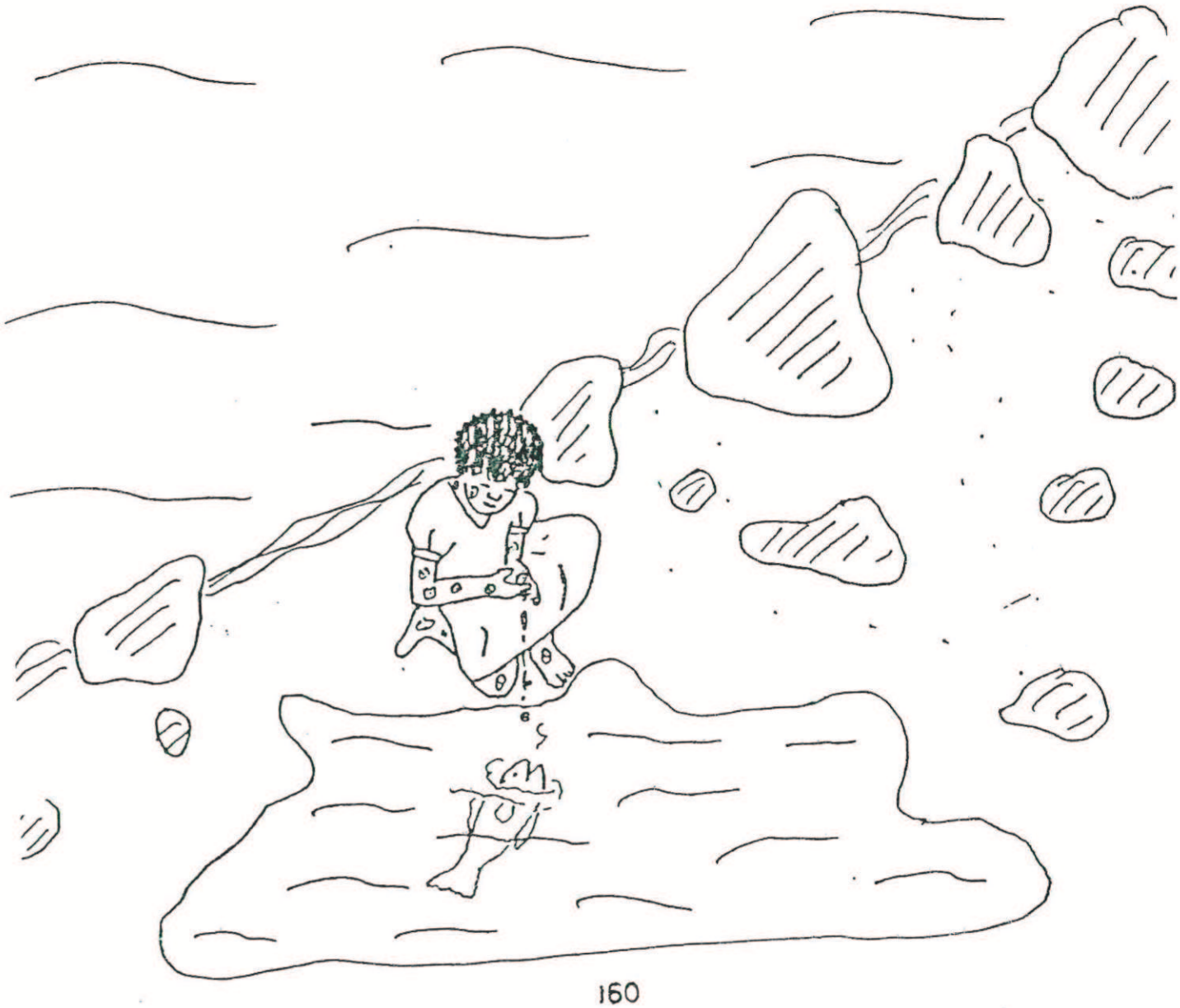
---

1. Natu nd Mawi were two sisters. Their parents had died and they lived by themselves on the sea coast. They had a house and a garden.

Natu was very beautiful but she was also very arrogant. While Mawi was covered with pimples and did most of the work in the house and in the garden. She always tried to do her best.

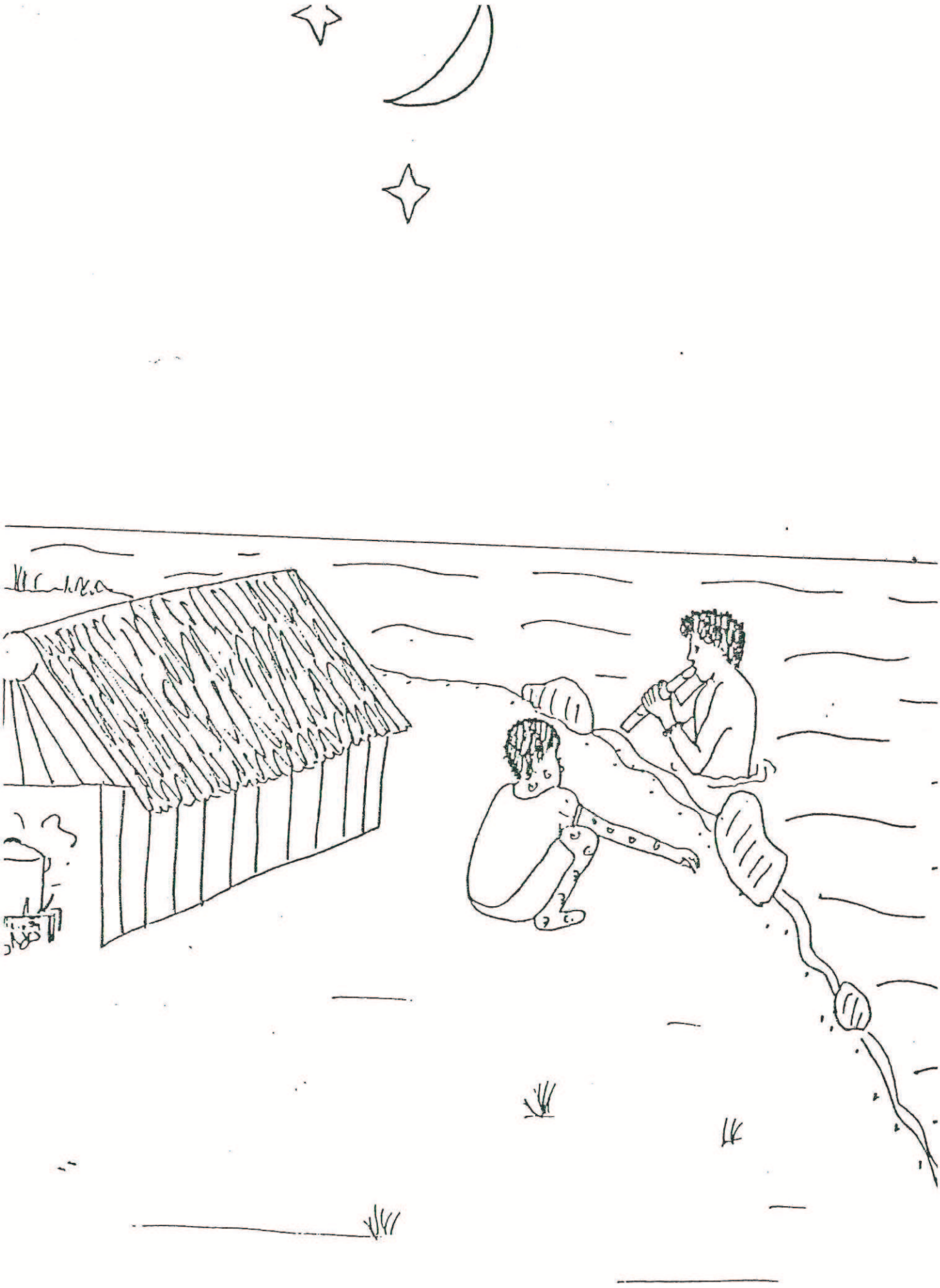
3. One day, the two sisters decided to go fishing. They brought with them a parcel of laplap made of yam and island cabbages. The tide was low so Natu went out fishing while Mawi sat at the edge of a pool watching the fish swimming in it. She was sad because she could not go as far as her sister Natu to catch fish.

4. While sitting at the edge of the pool, Mawi saw a little blue fish so she began to feed it. She went to the pool every day when it was low tide to feed the little blue fish.



5. Mawi was very much happier than before now she had a new friend, the little blue fish. One day the little blue fish told Mawi that soon he would come to live with her. Mawi did not say anything about that to her arrogant sister, Natu. She tidied the house, cleaned around it and cooked a very delicious meal.

6. When evening fell, Mawi finally stopped and sat down to rest. It was then she heard very nice music coming from the sea. The music got closer and closer still and suddenly a very handsome young man appeared. He was wearing necklaces and bracelets on his hands and ankles. His body was shinning with coconut oil and he was blowing a bamboo flute to play music.



7. The young man came and sat close to Mawi and immediately Natu became jealous. She asked the young man to come and sit close to her because her sister was not pretty with her pimples. But the young man refused. So Natu picked a huge stone and threw it at Mawi. Mawi died.

8. When Natu turned to look in the direction of the young man, he was no longer there. He was already walking towards a plant and disappeared inside it.
Natu became very sad, and soon afterwards she died of sorrow and loneliness.
The plant in which the young man disappeared is still growing in the same place. If one tries to get a branch to plant it elsewhere, it will die. The only place that this plant could grow is where Mawi once lived.

LESSON 36

TITLE: Assessment.

AIMS: Determine the knowledge and vocabulary obtained through questions and exercises.

DURATION: Varies a lot.

MATERIALS: None.

ACTIVITIES:

The teacher chooses the kind of test which will best suit his class in terms of pupils, material and the environment.

He could prepare group tests and also individual tests.

The aim is to work out the level reached in the language of education and in the basic understanding of the world of animals and plants.

GENERAL INFORMATION FOR THE TEACHER

THE NOTES WHICH FOLLOW

MAY BE CONSULTED BY THE TEACHER

THEY ARE NOT INTENDED TO FORM

THE BASIS OF LESSONS FOR PUPILS STUDYING

FISH IN YEARS 3 AND 4.

GENERAL CHARACTERISTICS OF FISH

Fish are vertebrates, but they form a group which is different from all the others:
mammals, birds, reptiles and Batrachia. These other groups look different but all have a very similar organisation; on the other hand, fish look similar but their organisations may vary enormously.

They are all vertebrates with jaws or gnathostomata.

APPEARANCE

SHAPE - There are about 30,000 species of fish. They can be classified by shape, as follows:

1) A long tube tapering towards the head and broader at the rear, with a tail (the most common shape).

   The back, flanks and belly of the tube have fins; this shape presents least hydrodynamic resistance and provides the best swimmers.

   e.g.: Shark, tuna, cavally, mullet, etc.

2) Flat shape, including:

   a) fish flattened from top to bottom, from back to belly and laterally broad.

      e.g.: rays.

   b) Laterally flat fish with flanks so well developed and fleshy that they become the upper and lower surfaces of the animal, while the back and the stomach, which are very thin, make up the sides of the fish and the eyes are shifted to the upper surface.

      e.g.: dab, sole.

3) Elongated shape (less common).

   a) cylindrical body

   e.g.: eel, moray.

   b) very flat body, like a ribbon.

   e.g.: oarfish.

4) Large-headed shape. Generally poor swimmers, living near coastlines or in fresh water, on the bottom or hidden under coral or rocks.

e.g.: scorpion fish, goby, etc.

5) Globular or box-shaped. Poor swimmers.

e.g.: porcupine fish, ostracions or trunk-fish living around coral reefs.

A separate group is made up of those fish which are not designed to move at all, such as sea horses which drift around gracefully but very slowly in coastal algae.

SKIN AND SCALES

- The skin of fish also has a dermis and an epidermis.

The epidermis, or external part, consists of several layers of cells, some of which, the glandular cells, secrete a large amount of viscous mucus.

Some of these glands may be venomous and some luminous.

The scales are produced by the dermis and also the epidermis. They are almost always arranged like tiles on a roof and are embedded from front to rear. However, they may vary greatly in shape, thickness and structure:

- Some are really small cutaneous teeth (placoid scales) which, close to the mouth, change imperceptibly into true teeth embedded in the jawbone.

e.g.: shark, ray.

Others are smooth and thin.

Yet others are thick, rugged and equipped with spines. Some form plates juxtaposed on one another to create armour (trunk-fish).

Finally, many fish do not have scales but have skin covered with a thick and plentiful protective mucus.

e.g.: blennies, morays, eels (although the latter also have very fine scales hidden in the dermis.)

- It is this mucus which protects the body of the eel, enabling it to pass easily from fresh water to salt water and vice versa. If you wipe an eel's body, thus removing its protection, it can no longer cope with changes in salinity and dies. The mucus and scales both provide protection.

Each species has a fixed number of scales. Scales are counted length-ways in rows starting from the base of the gill cover and going as far as the start of the caudal fin, and width-ways in rows towards the centre of the body. These scales appear at a young age and grow as the fish develops.

Each scale is made up of layers of cells laid down from the centre to the edge, the last layer being on the scale's external edge. When the body is in periods of intense development, the scales display broader, clearly distinguishable layers. On the other hand, when the fish is eating little or nothing at all, for example during breeding, the scales do not grow much. Since this phenomenon occurs periodically, one can judge the age of fish by examining their scales.

Some fish and particularly lagoon fish are decorated with irridescent colours and make an extraordinarily colourful sight.

These colours are due to two factors:

- some display colour because of pigments contained in the cells of the dermis;

- others reflect and shine because of guanine crystals secreted beneath the scales, or because the scales themselves break down the light.

The pigment cells (chromatophores or chromatocytes) contract and expand under the skin, in accordance with the light conditions, the colour of the bottom or the emotions of the fish, which explains why some fish change colour.

Fins equate to the limbs of other vertebrates and are the locomotive organs. They also enable fish to keep their balance and act as stabilisers. Fins are membranes stretched over fine rods known as rays. Fins may be soft, rigid or spiny, according to the configuration of the rays.

Fins are classified as follows:

1) Paired fins (corresponding to vertebrates' limbs) including:

- two pectoral fins (upper limbs) always behind the head on the sides of the body.

- two pelvic fins (lower limbs) or ventral fins, but this name may lead to confusion with the anal fin.

The position of the pelvic fins is variable:

Sometimes abdominal.

Sometimes at the front under the neck (pelvic jugular).

Sometimes above the pectorals (pelvic thoracic).

In some fish, these mobile fins provide locomotion, in others, enlarged versions of these fins form planers (flying fish), or, if they are joined together, they form a ventral sucker (gobies).

Finally, in some fish which live at great depths, the fins are changed into [illegible]

2) Unpaired fins, including:

- one or more dorsal fins on the back.

- one anal fin general located immediately behind the anus.

- one caudal or tail fin which may be rounded, lobate, forked, straight or sometimes joined to the anal fin (eel).

This candal fin is always vertical is fish, while in cetaceans (whale, porpoise, dolphin, etc.), which are mammals, it is horizontal.

The dorsal and anal fins in particular provide balance by preventing lateral oscillations.

The pectoral, pelvic and especially the caudal fin (which plays the role of rudder and propeller) are the motive organs but, to a lesser degree, they also help with balance.

According to the shape of the fish, we may observe several types of fin:

Those on tube-shaped fish which use their fins as oars.

These animals can move at medium or high speed.

Those on flat fish which seem to plane through the water, e.g. rays with large pectorals and soles with small pectorals but whose bodies fold flat.

Those on fish with long cylindrical bodies which ripple like snakes, e.g.: eels.

In some flying fish, the pectoral fins are so well developed that they enable the animal to jump out of the water and plane above the surface for several metres before falling back into the water.

We must not forget the role of the air bladder which lightens and stablises the body and provides for internal gas movements.

SKELETON

As with all vetebrates, the skeleton is made up of:

- a skull
- a spinal column
- appendages supporting the limbs.

The shell is a cartilaginous case in salachians (sharks, rays, etc.) and made of bony plates in teleosts.

The skull and the first few vertebrae support the cartilaginous or bony structures of the jaws, the gills or the gill covers.

The spinal column comprises a whole seri es of similar vertebrae.

The appendicular skeleton, as with all vertebrates, comprises:

- a scapular girdle (attached to the skull) supporting the pectoral fins (upper limbs).

- a pelvic girdle supporting the pelvic fins (lower limbs).

The unpaired fins are directly attached by pieces of bone to the vertebrae.

DIGESTIVE SYSTEM - FEEDING

The teeth:

1) Most fish have quite similar teeth - small, sharp, very numerous, arranged in one or more rows on the edge of the jawbone and sometimes spreading to the roof of the mouth and even the tongue.

2) Some fish have teeth resembling incisors, canines and molars, e.g.: blennies.

3) Others have teeth in blocks like tiles, e.g.: rays.

4) Some have a maximum of four huge teeth, forming a kind of beak. These are the browsers: globe fish, porcupine fish, parrot fish, etc.

5) Sharks have triangular, pointed teeth arranged in several rows on each jawbone. The rows of "reserve" teeth are folded away towards the rear and stand up when required.

6) Some fish have extremely diminished teeth or even no teeth at all. In this case, they are replaced by a roughening of the pharyngal bones.

   These pharyngal teeth are also to be found in parrot fish, which also have maxillary teeth or a maxillary beak.

The disgestive system comprises a tube with attached glands.

The tube is often in the shape of an elongated "S". It is short, simple and uniform from one end to the other.

The first part is the oesophagus onto which the air bladder and sometimes the lungs open.

The second part, the stomach, is expandable.

The third part is the intestine.

The junction of the stomach and the intestine, or pylorus, is narrow and often has numerous separate or joined pyloric appendages (see dissection). Some fish also have a masticatory gizzard (mullets).

The associated glands are the liver and the pancreas (see dissection). As with all aquatic animals, there are no salivary glands.

FEEDING

Fish are usually carnivorous and eat shell-fish, crustaceans small fish, eggs and larvae. Some are omnivorous rather than herbivorous and eat vegetable and animal debris.

RESPIRATORY SYSTEM

Fish breath through gills located on each side of the head under the gill covers in teleosts and attached to the walls of the gill openings in selachians.

The gills are bright red since they are irrigated by blood.

Each one consists of a gill arch bearing red filaments in the form of a tooth comb on the convex side and pink roughness on the concave side.

Air enters through the mouth, washes over the gills and exits through the gill openings.

In dipneusti, blood which is depleted in oxygen rushes to the gills or to the walls of the lungs, which open onto the oesophagus. Oxygen is essential to the life of fish in water. This oxygen forms part of the air dissolved in the water; it is replenished by the movements of the surface of the water and by the chlorophyllic action of algae or other plants living in the water. However, there is only a small quantity of oxygen in the water (a much smaller quantity than in the air) so fish's breathing is restricted, resulting in the production of little heat; consequently, fish have a variable temperature.

BLOOD AND CIRCULATION

The blood of fish, like that of other vertebrates, is made up of plazma and red and white corpuscles.

The blood leaves the heart, circulates in the arteries and capillaries and return to the heart through the veins. On leaving the heart, the blood which is depleted in oxygen is directed to the gills where it is enriched in oxygen before going on to irrigate the rest of the body. The heart has an auricle, a ventricle and an aortic bulb. (see dissection).

SENSES

Hearing - fish have internal ears located on each side of the skull but they appear to provide balance and orientation, rather than hearing.

On the other hand the lateral line, which consists of many tiny tubes ending in nerves, gives the fish perfect information on the slightest vibration in the water and really acts as an ear.

Sight - Despite the large size of their eyes, fish have poor vision since they live in an environment which ceases to be lit a few metres down and also because their eyes do not adjust well. However, they are very sensitive to variations in colour and lighting and especially to movements.

Touch, smell and taste - these sense organs are to be found on the skin, sometimes on highly developed fin rays and on the barbs.

The most acute senses are taste and hearing.

KIDNEYS

Fish have kidneys (see dissection) attached to the dorsal wall of the rib cage.

REPRODUCTION

The females lay eggs which hatch into young fish. Most fish are oviparous.

Some selachians (sharks, rays) are ovoviviparous, i.e. the young grow inside the female's body and are already formed when they are ejected (see dissection for reproductive system).

Reproduction generally occurs once a year at different times, according to the species. Some fish experience this reproductive period only once during their lifetime, while others reproduce for several years in succession.

CLASSIFICATION OF FISH

Selachians or elasmobranchs (sharks, rays)

Actinopterygians (ganoids and teleosts) - extreme development of dermal bone.

Dipneusti with aquatic and atmospheric respiration.

Selachian sub-class: fish with cartilaginous skeletons and cutaneous teeth. Five to seven gill openings on each side of the head.

Includes the Euselachian order: sharks or dogfish and rays and the Holocephali order: chimaera.

Actinopterygian sub-class: fish with cartilaginous or bony skeletons, no cutaneous teeth, gills with gill covers, fin rays of scaly origin.

Chondrostei infraclass: cartiliginous skeleton with bony dermal plates: sturgeons.

Holostei infraclass: more or less bony skeleton. Includes two sub-orders, living in fresh water in North America.

Teleostei infraclass: bony skeleton. Very numerous, consisting of ten orders and thirty sub-orders.

Dipneusti sub-class: lobed fins, respiration through gills and lungs.

DISSECTION OF RED MULLET

1) External appearance (see Fig.):

Note:

a) The shape: broad tube.

b) Fins:

i) Paired fins replacing limbs:

- one pair of pectorals,
- one pair of abdominal or pelvic fins,
- their position varies according to the fish.

2) Unpaired fins:

- two dorsals, the first with pointed rays, the second with flexible rays (variable according to fish).

- one ventral or anal starting with a large ray (variable according to fish).

- one caudal (shape variable according to fish).

c) The three orifices in front of the ventral fin are, from back to front: urinary orifice, genital orifice, anal orifice (or anus).