

Topic 2 : Animals

1. Key concept	Animals can be categorized. Human being is closely related to other animals.
2. Learning objective	
General	1) Be able to know that animals can be vertebrates or invertebrate 2) Be able to know that animals may be useful or harmful to people.
Specific	1) Be able to describe that some animals are vertebrates and some are invertebrates 2) Be able to describe the general characteristics of mammals 3) Be able to explain general characteristics of amphibians and reptiles and explain the differences between them 4) To be able to explain general characteristics of birds 5) To be able to explain general characteristics of fishes 6) Be able to describe that animals can benefit man
3. Activities involved	Observing a fish and a prawn Properties of mammals compared to other animals Comparing amphibians and reptiles Finding benefits from animals in our lives
4. Activity purpose	

Before Getting Started

Self-check list for Teachers	<input type="checkbox"/> Am I sure about vertebrate and invertebrate? <input type="checkbox"/> How many mammals do I know? <input type="checkbox"/> Do I know enough about properties of mammals, reptiles, amphibians, birds and fishes? <input type="checkbox"/> Can I find benefits from animals in my life?
Background information for teachers	
Vertebrate & Invertebrate	<p>All animals can be classified into vertebrate and invertebrate. Do you know how many species of animal exist. There are more than 1,100,000 species identified. Most of them are invertebrate, specifically insects. Vertebrates are about 50,000 species.</p> <p>The difference between vertebrate and invertebrate is with back bone or without back bone. It is commonly mistaken that insects and some crustaceans are regarded as vertebrate. This is because some of those look somehow solid and tough. They have hard skins or outer shell, but they do not have back bone.</p>
Mammal	<p>There are common misunderstandings about mammals. Human is the only mammal and human is not animal. In fact, there are about 4,500 species of mammals and human is just one of them. Not to mention, human is an animal. Lions, Whales, dolphins, zebras, bats, cats, dogs, and gorilla are all mammals.</p> <p>There are some commonalities in mammal.</p>

1. Mammals have warmed blood.
2. Sizes of mammals are big.
3. Most of mammals are very intelligent.
4. Mammals have highly developed senses.
5. Mammals look after the young. (feeding milk, educating how to survive.

Birds

There are more than 9,000 species of birds. All birds hatch from eggs with hard shells. They are found all over the world, like from the coldest polar to the hottest desert. Most of them have decent feathers which are perfectly designed to fly. Some birds can fly so fast. A falcon can dive vertically through the air at speeds of 180 miles per hour.

They have the powerful breast muscles to beat wings. A well-oxygenated blood supply is essential for the muscles to work. Birds have a well developed pair of lungs to efficiently get more oxygen in air.

The specialty of some birds is a very high ability of eye-sight. They can find their foods on the ground from the high point of sky. They can catch fishes in the water as well.

According to some scientist, birds are the descendents of dinosaurs which lived on the earth 150 million years ago, although this is very controversial. It is also said that those dinosaurs and giant reptiles died out 65 millions years ago because the earth might have been hit by a gigantic meteorite. This caused a long winter as the light from sun was blocked by dust cloud.

Reptile

There are 6,500 species of reptile. Lizard, Crocodiles, turtles and snakes are commonly known as a reptile. Reptiles are cold blooded animals and they live in warm climates. They are characterized by their dry, scaly skin.

The lizard makes up the largest group of reptiles. There are around 3,000 species of lizard. The sizes of lizard vary largely as well. Small one can be only 4cm long but the biggest one could be 3m long.

Many reptiles in general prey on insects and small mammals. Some snakes pursue mice into their burrows or climb up trees to take young birds. Chameleons and lizards eat insects. Mammals, like small deer, can be a prey to Crocodiles.

Amphibian There are 3,000 species of amphibian. Frog is the major amphibian. Amphibians are the smallest group of vertebrates. Like fishes and reptiles, they are cold-blooded animals. This means that amphibians can not regulate their own temperature and rely on the sun to warm their bodies. Most amphibians begin their lives in the water, breathing with gills. As they grow, they develop lungs and legs, and are able to move about on dry land.

Most frogs and toads prey on insects and other small animals, staying perfectly still and waiting for their prey to pass. Some use their long and sticky tongues to catch prey.

Fish There are around 27,000 species of fish. 60 % of fish species live in sea (salt) water. Others live in fresh water, and a few can live in sea water and fresh water. Fishes are the first animals with backbones (vertebrate) and the best adapted to life in water.

Fishes breathe through gills on either side of the head. When water passes out through the gill slits, oxygen in water is absorbed by gill.

All female fishes lay eggs, usually a great many, which are fertilized by males. When babies hatch, they must fend for themselves. Only a few fish care for their young.

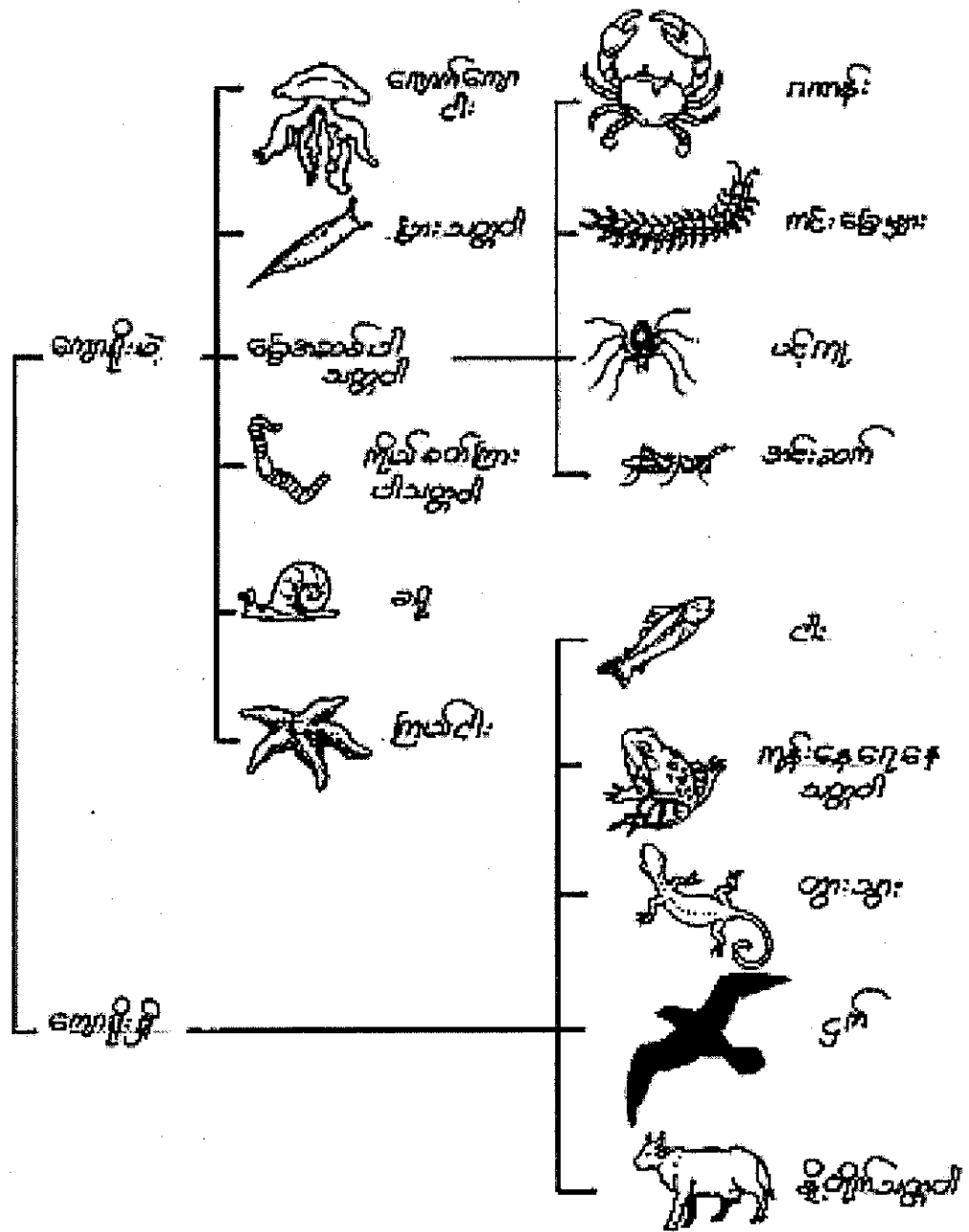
Do you think that dolphins and whales are fishes since they live in water? The answer is "No". They are categorized as mammals.

Benefits from animals Human and animals have strong relationships. Our life is greatly supported by other animals. Let us find how other animals contribute to human. You can find 11), 12),,,, and continue.

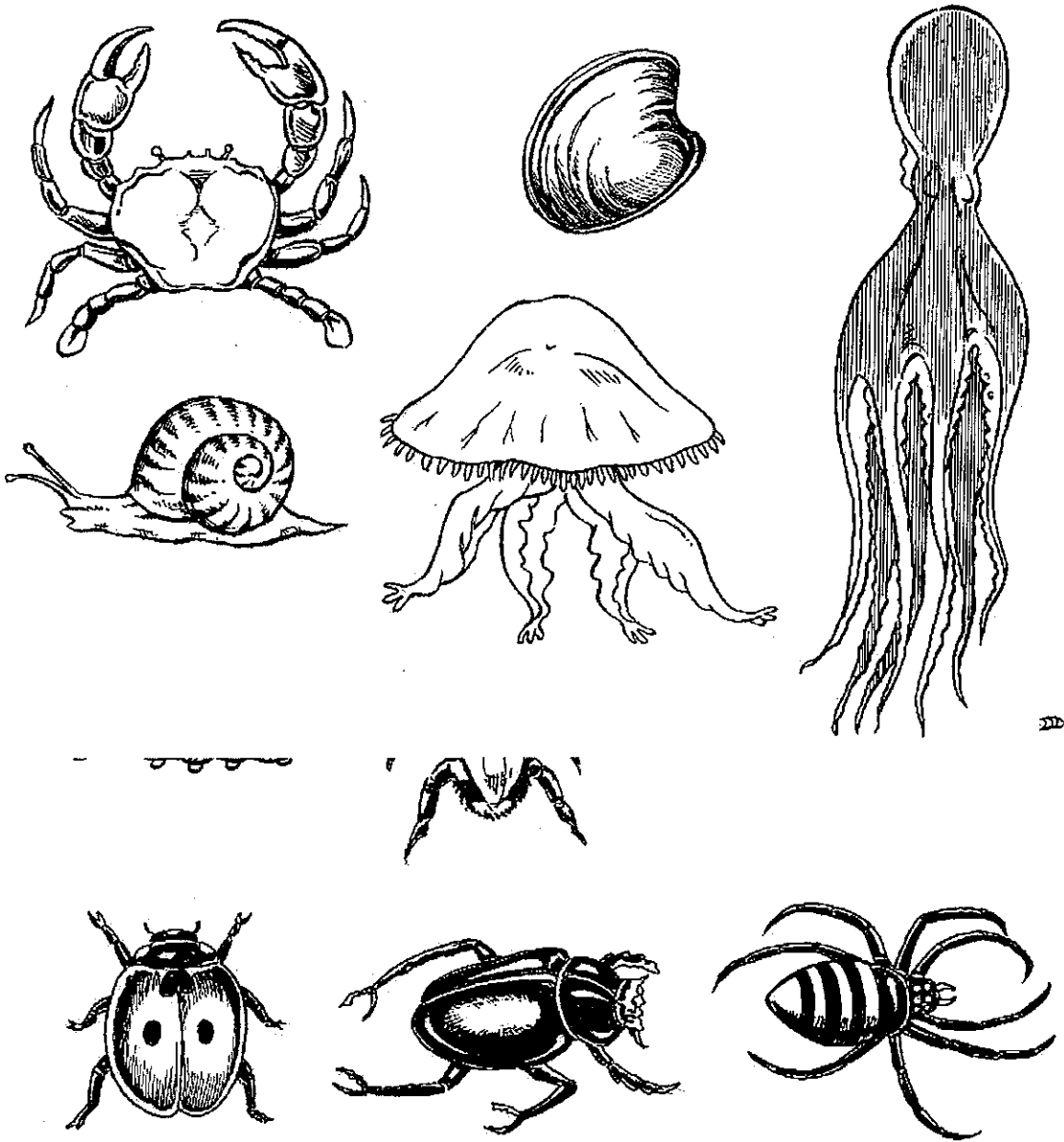
- 1) Some animals provide meat
- 2) Some animals provide milk
- 3) Some animals provide pharmaceutical matter.
- 4) Some animals provide silk
- 5) Some animals provide fur and leather
- 6) Some animals provide feather
- 7) Some animals provide perfume
- 8) Some animals provide manure
- 9) Some animals are used for medical research
- 10) Some animals are used as labor.

Harm from animals Some animals can be harmful to human. Shark in sea, crocodile, poisonous snake, tiger, leopard, lion, bear, wolf and others are commonly known as dangerous animals. Some of those are not harmful by nature, but when they are with young and they are approached too closely, they become very violent. Even a dog could be dangerous when the dog is very frustrated or is rabies.

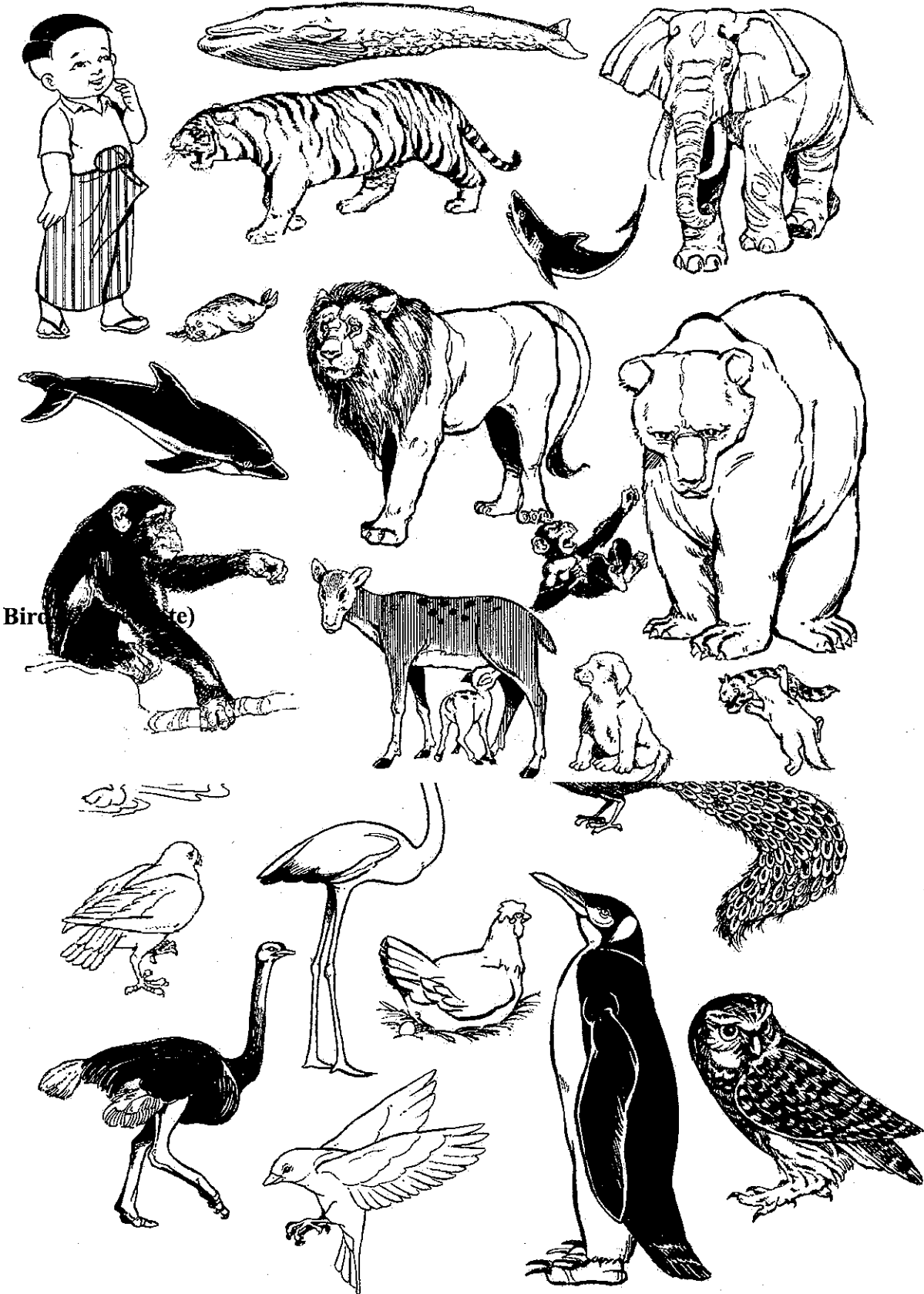
Even some insects like bee can be dangerous as well. Some mosquito can contribute to infect human with malaria. Some specific fly can disease to human as well. How about mousse? They could have many kinds of bacteria due to their habitant. Human occasionally gets infected with virus which has been possessed by other animals.



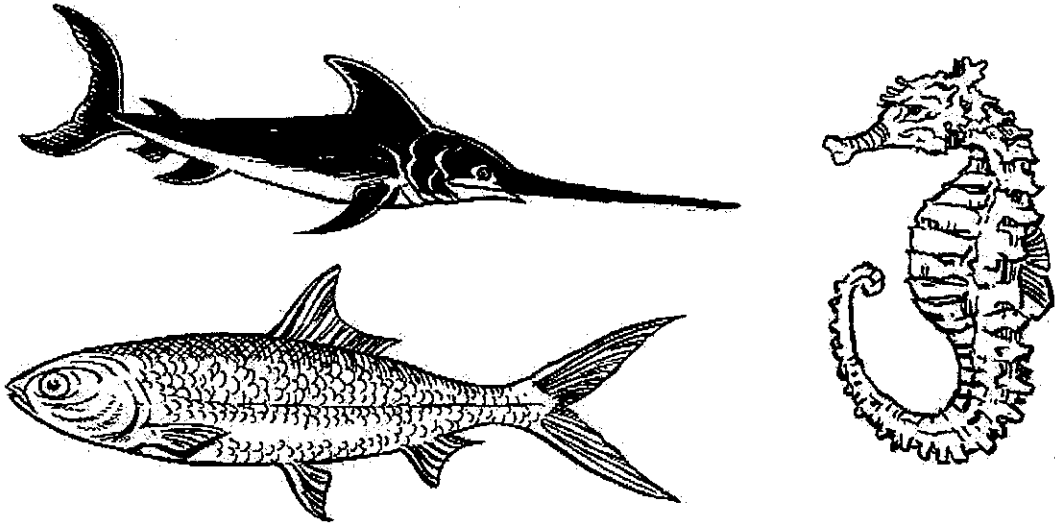
Invertebrate (examples)



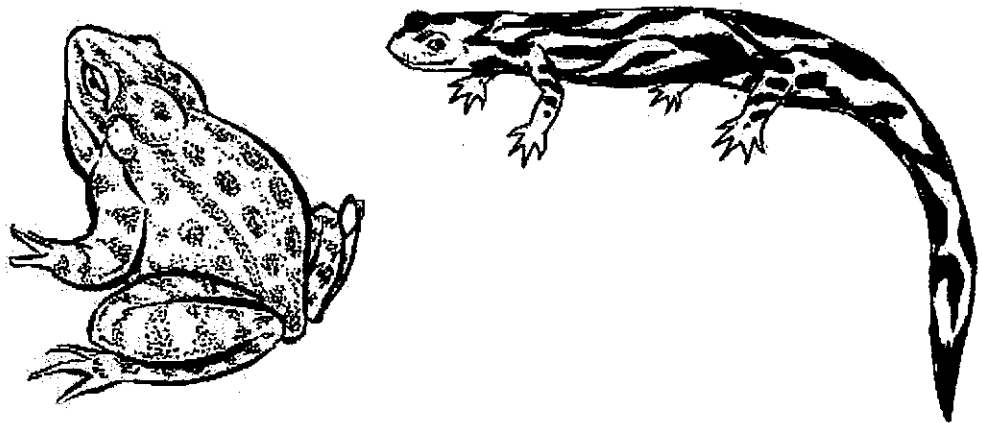
Mammals (Vertebrate)



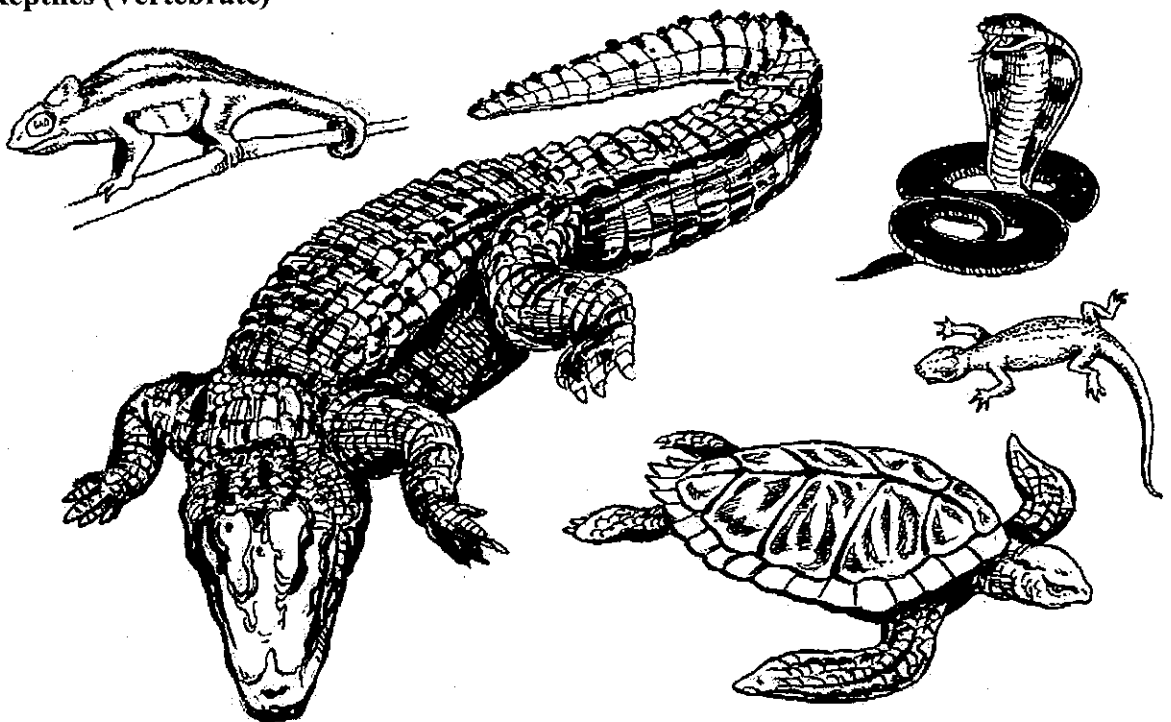
Fishes (Vertebrate)



Amphibians (Vertebrate)



Reptiles (Vertebrate)



Lesson Planner

Suggested period (11)	Period 1	Period 2	Period 3
Lesson topic	Vertebrate and Invertebrate	Mammals	Reptiles and Amphibians
Sample lesson plan	2-1	2-2	2-3
Specific objective	Be able to describe that some animals are vertebrates and some are invertebrates	Be able to describe the general characteristics of mammals	Be able to explain general characteristics of amphibians and reptiles and explain the differences between them
Introduction (Motivation/Create interest/Active prior knowledge)	Bring out the places in one's body where the bones exist	Think and bring out the main different fact of the two animal groups contained in the picture.	Have you ever heard the cries of which animal around your house in the rainy season? Tell the name of animal that lives on the ceiling and walls of one's house and sometimes cries.
Core/Development (Active engagement with test/task)	Teacher tells how to observe the experiment he has prepared.	Teacher has to bring out with effective and related help and directions to be able to bring out the general characteristics of mammals	Let the children observe comparatively the life cycle of frog and house lizard. Ask questions to bring out scientific thinking for the difference between amphibian and reptile.
Assessment points	Do the students can think and bring out the predictions? Do they find and understand properly the place where vertebral column is? Do they properly differentiate the vertebrate and invertebrate group?	Do the students able to bring out their prior knowledge? Do they able to find out the characteristics of mammals with the guidance of teacher?	Do they think and bring out the prediction? Do they find the different characteristics of amphibian group and reptile group? Do they bring out and present the outcome of discussions?
Adaptation of curriculum			

Lesson Planner

Suggested period	Period 6	Period 7	Period 8 and 9	Period 4 5 10 11
Lesson topic	Bird	Fish	Benefits from animals	Assessment/ Review
Sample lesson plan			2-4	
Specific objective	To be able to explain general characteristics of birds	To be able to explain general characteristics of fishes	Be able to describe that animals can benefit man	
Introduction (Motivation/Create interest/Active prior knowledge)	Name of birds you know and let us think about their characteristics.	Name of fishes you know and let us think about their characteristics.	Which animals have poison and which animals do not have poison.	
Core/Development (Active engagement with test/task)	Let us observe the feather of a bird with a magnifying lens	Let us observe gills and scale of a fish with a magnifying lens	Teacher has to give help for the students to be able to bring out that the body of some animals is useful	
Assessment points	Do they find birds around them? Can they find commonalities among birds? Are they interested in observing? Do they draw what they observe?	Do they find fishes around them? Can they find commonalities among fishes? Are they interested in observing? Do they draw what they observe?	Can they look around their lives to find the benefits from animals? Do they discuss and contribute ideas to group?	
Adaptation of curriculum				

Activity 1 Vertebrate or Invertebrate

Teaching/learning material

Skeletal system of fish (to remove the muscles), Prawn (or) other readily available invertebrate, Plate to put in

Concept Animals can be vertebrate or invertebrate

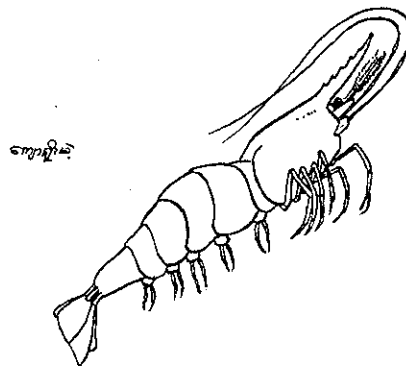
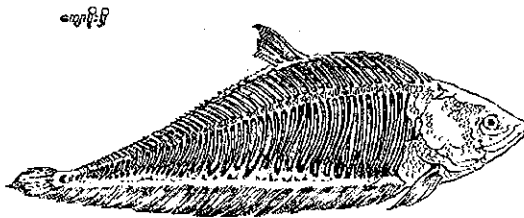
Let us observe fish and prawn. Fish is categorized as vertebrate and prawn is categorized as invertebrate.

Let us touch the back bone of fish and its structure.

How about the prawn? It has hard shells covering the body, but does it have the back bone?

Many children misunderstand that insects or animals with hard shells are vertebrate. Let us make sure the difference between vertebrate and invertebrate by observing fish and prawn

It is better to put both animals on thick paper or polystyrene foam since liquid with unpleasant odor from both animals comes out.



Activity 2 Mammal

Teaching/learning material

illustration showing mammals, illustration showing other animals

Concept Children understand main properties of mammals

Let us think about the main characteristics of mammals by comparing them to other animals. Teacher prepare illustrations showing 2 groups, group A shows several kinds of mammals, and group B shows fish, bird, amphibian and reptile. Teacher can draw them on the blackboard as well.

Questions for children to think about are

1. What is the commonality in group A? (answer, babies are born without egg)
2. What is the commonality in group B? (answer, babies are born with egg)
3. What are the differences you can see between group A and group B?

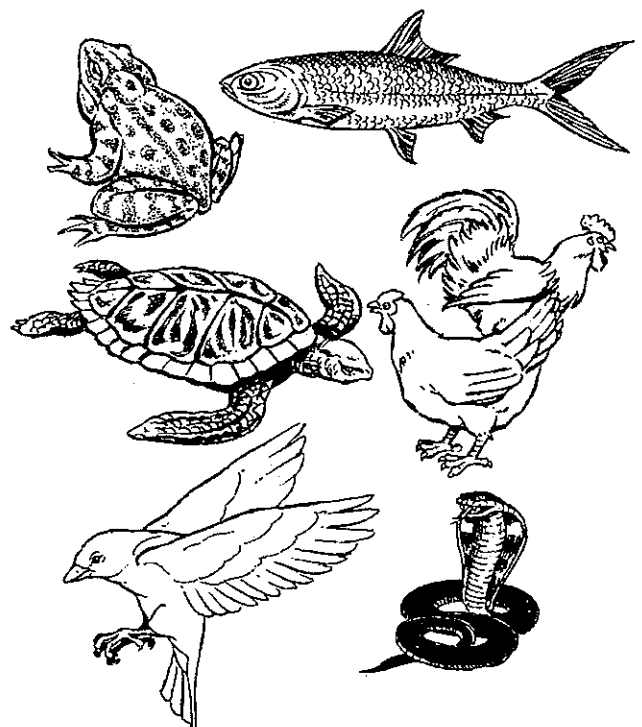
Main properties of mammals are

1. No egg
2. Intellectual
3. Comparatively big in size
4. Giving milk and Parenting(educating youth)
5. Warmed body temperature
6. Hair on skin

Group A



Group B



Activity 3 Difference between Reptile and Amphibian

Teaching/learning material

Illustrations of frog and house lizard

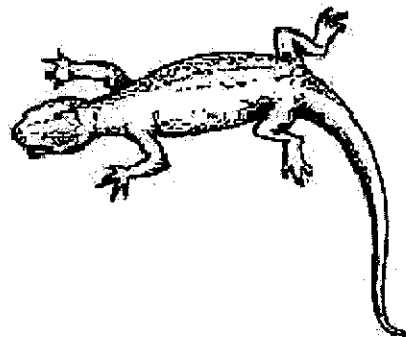
Concept

Children understand the differences of reptile and amphibian

Compare a frog and house lizard by asking questions to children. Children are supposed to answer from their experiences.

	Frog	House lizard
1. Do they hatch from egg?		
3. How do they develop?		
4. Where do they live?		
5. What food do they eat?		
6. By which organ do they breathe?		
7. How many appendages do they have on the body?		
8. What is the distinct feature of the skin?		
9. How do they move?		

After filling in this table, let us summarize both main characteristics with children.



Activity 4 Observing a feather

Teaching/learning material

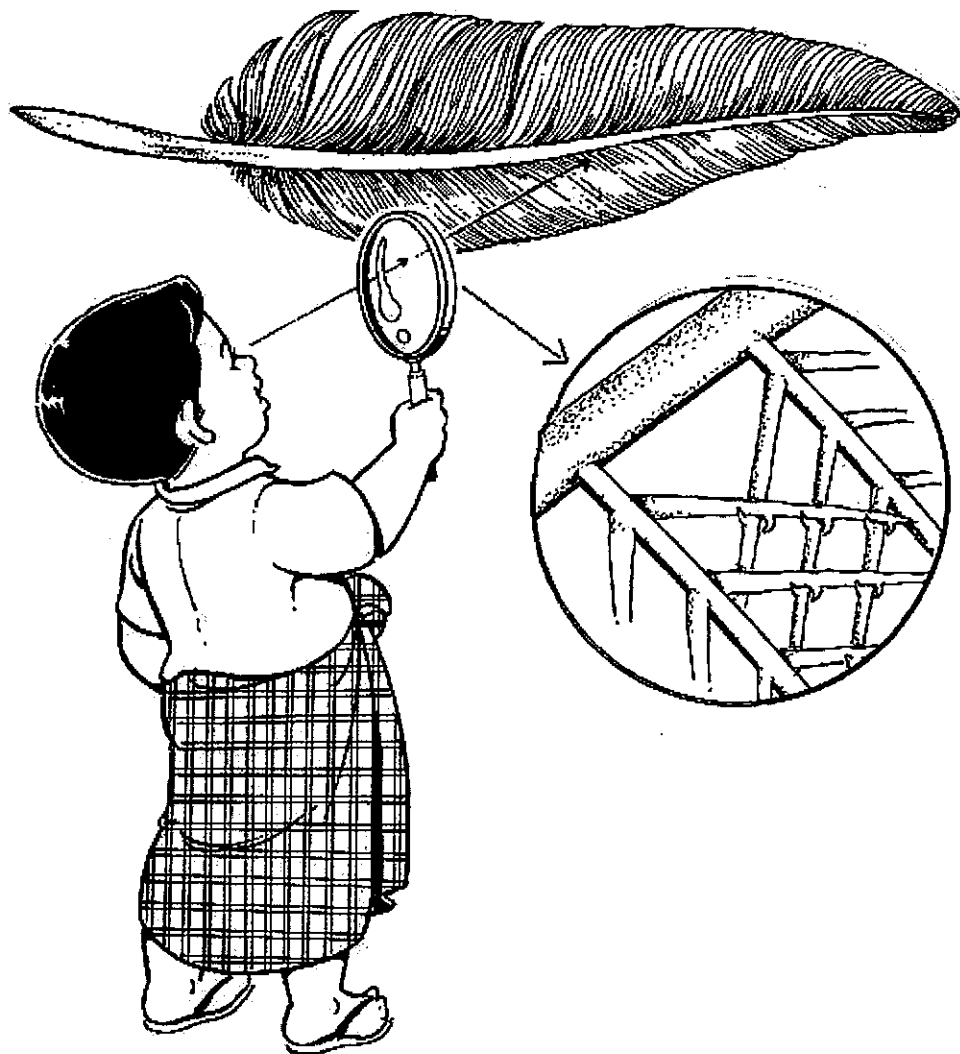
Feather of a bird, magnifying lens

Concept

Children understand the structure of feather by looking at it with a magnifying lens.

Prepare feathers of any birds. Let us observe them with a magnifying lens.

Encourage children to draw the structure of feather on their notebook and speak out about their findings.



Activity 5 Think about general characteristics of birds

Teaching/learning material

Concept Children understand some main characteristics of birds.

Encourage children to mention birds they know.

List up those on the blackboard as many as they mention.

Let us try to find general characteristics of birds.

Main characteristics of birds are

- 1) Most of them have decent feathers which are perfectly designed to fly.
- 2) The specialty of some birds is a very high ability of eye-sight
- 3) They have warmed blood.
- 4) They live over the world (from very cold place, like minus Celsius to very hot place, like desert)
- 5) They have various beaks.

Activity 6 Observe a gill and scale of fish

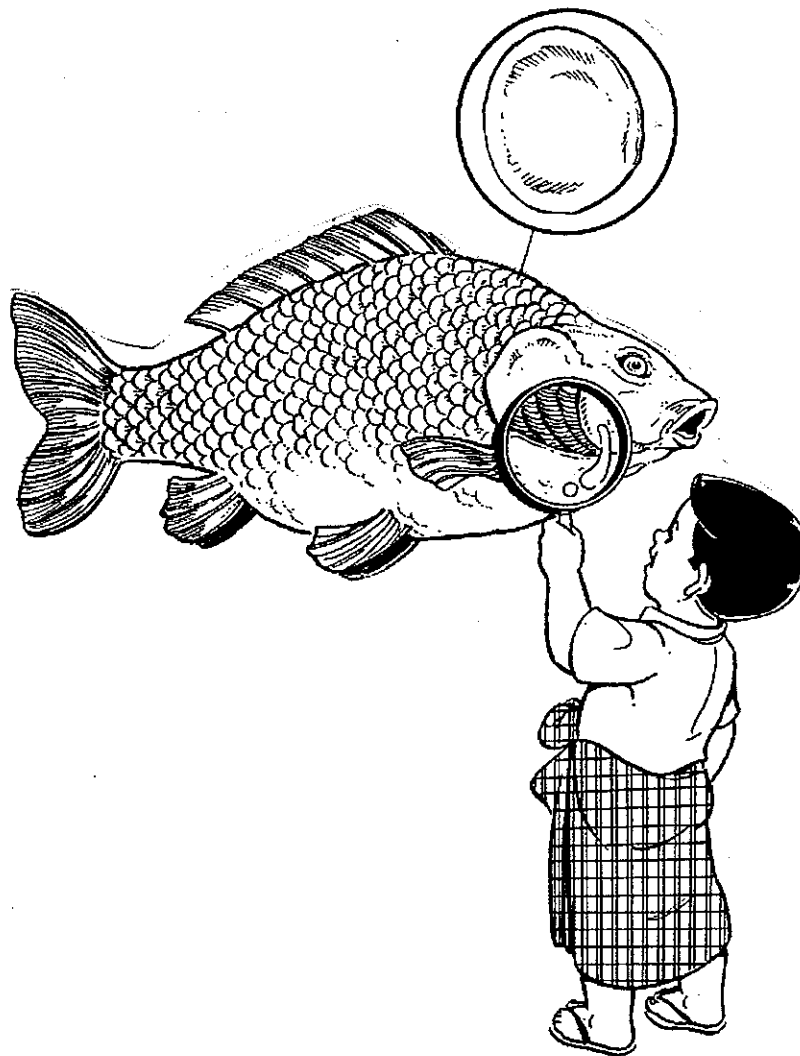
Teaching/learning material

Fish

Concept Children observe gills and scales of fishes with a magnifying lens.

Prepare any fish. Let us observe gill and scale of fish with a magnifying lens.

Encourage children to draw gills and scale on their notebook and speak out about their findings.



Activity 7 Think about general characteristics of fishes

Teaching/learning material

Concept Children understand some main characteristics of fishes.

Encourage children to mention fishes they know.

List up those on the blackboard as many as they mention.

Let us try to find general characteristics of fishes.

Main characteristics of fishes are

- 1) They live in water.
- 2) Fishes breathe through gills on both sides of the head.
- 3) All female fishes lay eggs, which are fertilized by males.
- 4) They have various kinds of fins to swim
- 5) Some are carnivore and some are herbivores

Activity 8 Benefits and harms from animals

Teaching/learning material

Concept Children understand benefits and harms from animals.

Human is one kind of animal. Human lives with other animals and we greatly enjoy benefits from other animals.

Let us try to find benefits human gets from other animals.

Occasionally, other animals become very harmful to human as well. Let us mention those harmful animals.

Activity 9 Harm for animals from human

Teaching/learning material

Concept Children understand human occasionally harm other animals.

Let us try to stand at the view points of other animals and think about the harm from human. Human occasionally kill animals without any reasons. Human also killed some animals to get their horns, tuskers, bones and skins for private business reasons. This has attributed extinct of many kind of animals.

Lesson Plan 2-1

Lesson topic: Vertebrate or Invertebrate
 Learning objectives: Be able to describe that some animals are vertebrates and some are invertebrates.
 Teaching/learning materials: Skeletal system of fish (to remove the muscles), Prawn (or) other readily available invertebrate, Plate to put in
 Teaching period: 35 minutes (1 period)

Teaching/Learning procedure

Learning activities	T	Teaching/ Learning Materials	Points to be noticed				
<p style="text-align: center;">Introduction</p> <p>The lesson will begin with the following questions.</p> <ol style="list-style-type: none"> 1. Where do you think the bones exist in your body? 2. How will you give the name to the bone at the back of the body? 3. Have you ever seen which animals have vertebral column? 4. Do you think all animals have vertebral column? 5. Think the name of invertebrates that you have ever seen. <p style="text-align: center;">Core/development (Activity 1)</p> <p>Teacher will tell that it is going to observe if animals have vertebral column or not.</p> <ol style="list-style-type: none"> 1. Teacher draws the picture of a fish on the blackboard and asks the following questions to guess and answer. <ol style="list-style-type: none"> (a) Can the fish have vertebral column? (b) Where do you think the vertebral column starts and where it ends? Then the teacher will tell children to observe carefully the fish s/he is going to distribute from the head to the end of the body. Teacher will distribute teaching/learning materials to student groups. Students will present the findings from observation in front of the class by holding the teaching/learning materials. 2. Teacher shows the body of an invertebrate s/he has collected in front of the class and asks the following questions. 	<p style="text-align: center;">10</p> <p style="text-align: center;">10</p> <p style="text-align: center;">10</p>	<p>Blackboard, chalk</p> <p>Fish, the plate to put in</p> <p>Prawn (or) other invertebrate, plater to put in</p>	<p>Children's guessed answers will be recorded.</p> <table border="1" data-bbox="1062 696 1358 927"> <thead> <tr> <th data-bbox="1062 696 1198 734">Vertebrate</th> <th data-bbox="1198 696 1358 734">Invertebrate</th> </tr> </thead> <tbody> <tr> <td data-bbox="1062 734 1198 927" style="height: 80px;"></td> <td data-bbox="1198 734 1358 927" style="height: 80px;"></td> </tr> </tbody> </table> <p>Teacher has to help children notice that the vertebral column of the fish starts from the end of the skull and situated until the end of the body (beginning of tail)</p> <p>Teacher motivates students to know that it is necessary to dissect an invertebrate from the 'back'.</p>	Vertebrate	Invertebrate		
Vertebrate	Invertebrate						

Learning activities	Time	Teaching/learning materials	Points to be noticed				
<p>(a) Do you think this animal has a vertebral column? (b) How will you dissect this animal to find a vertebral column? Why? Teacher will tell students to observe carefully the animal s/he is going to distribute from the head to the end of the body. Teacher will distribute each student group the body of an animal s/he has already dissected. Students, after observation will present the answers by referring the teaching/learning materials in front of the class.</p> <p style="text-align: center;">Conclusion</p> <p>Students will be asked to scrutinize again the vertebrate and invertebrate animal groups guessed in the introduction part. Let the students correct and supplement the name of animals in groups. Students will present conclusion 'the bone at the back of the body of animals is called vertebral column' 'some animals are vertebrates and some are invertebrates'</p>	5		<p>The teacher has to motivate students to notice the difference between the vertebral column and body covering (cuticle) if the animal s/he has prepared is the prawn.</p> <table border="1" data-bbox="1058 562 1353 790" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th data-bbox="1058 562 1195 595">Vertebrate</th> <th data-bbox="1195 562 1353 595">Invertebrate</th> </tr> </thead> <tbody> <tr> <td data-bbox="1058 595 1195 790" style="height: 80px;"></td> <td data-bbox="1195 595 1353 790" style="height: 80px;"></td> </tr> </tbody> </table> <p>Teacher will conclude again. Teacher will supplement and tell the usefulness of vertebral column. The vertebral column 1. prevents the delicate internal organs of the body 2. supports the body 3. assists in body movement.</p>	Vertebrate	Invertebrate		
Vertebrate	Invertebrate						

Lesson Plan 2-2

Lesson topic: Mammals
 Learning objectives: Be able to describe the general characteristics of mammals
 Teaching/learning materials: Picture charts: Group A- mammals ,Group B- other vertebrates
 Teaching period: 35 minutes (1 period)

Teaching/Learning procedure

Learning activities	T	Teaching/ Learning Materials	Points to be noticed
<p>Introduction</p> <p>Teacher introduces the lesson with questions by showing illustrations. “ Observe the two animal groups carefully.” “Think and find out the major different characteristics between two animal groups.” Students present their guesses.</p>	5	Illustrations, blackboard, chalk Book, pencil	The guesses of children will be recorded. Let the children be aware of that the majority of animals in the group (A) are viviparous and those in the group (B) are oviparous.
<p>Development (refer to Activity 2)</p> <p>Teacher says that we, human, are concerned with group (A). We are going to discuss comparatively between the general characteristics of animals in group (A) and those of animals in group (B). (Ask the children to think about their bodies as the examples of animals in group A). Children present the results from the discussion. Based on this result, teacher says that animals in the group (A) drink the mother’s breast milk at the baby age so as to be called “mammals” and names the lesson topic.</p>	20		Teacher records the results of discussion of students. In order not to make their presentation deviate from the objectives of the lesson teacher asks the children; 1. to observe the hairs on their hands carefully 2. to hold the hands each other in order to know the warmth.
<p>Conclusion</p> <p>Each student group concludes the lesson by describing the general characteristics of mammals as follows: (1) Mammals drink mother’s breast milk at baby age (2) Mammals are looked after by their parents starting from the newborn age (3) Mammals have insulating body covering of hair (4) Mammals are warm- blooded animals (5) Mammals have the most developed intelligence and bigger body sizes</p>	5		Teacher tells the children that warm -blooded animals can maintain their body temperature and gives guide lines in order to make other general characteristics obvious.
<p>Teacher concludes the lesson again.</p> <p>Students copy the outcomes of their discussions in the notebooks.</p>	5		

Lesson Plan 2-3

Lesson topic: Amphibians and Reptiles

Learning objectives: Be able to explain general characteristics of amphibians and reptiles and explain the differences between them

Teaching/learning materials: Picture chart-(a) Metamorphosis of a frog, (b) Metamorphosis of a house lizard

Teaching period: 35 minutes (1 period)

Teaching/learning procedure:

Learning activities	Time	Teaching/learning materials	Points to be noticed
<p>Introduction</p> <p>It will begin with question.</p> <p>1. Have you ever heard the cries of which animals around your house in the rainy season?</p> <p>2. Have you ever seen the animal, which lives on the wall (or) ceiling of your house and sometimes gives signals by producing sound?</p> <p>Students will present the answers.</p> <p>Core/development (refer to Activity 3)</p> <p>Let's discuss about an ideal animal 'frog' and 'house lizard'</p> <p>Each fact described in the table will have to discuss among student groups to present.</p>	<p>5</p> <p>20</p>	<p>Blackboard, chalk</p>	<p>Teacher will record the children's answers</p> <p>"frog"</p> <p>"house lizard"</p> <p>Students discussed answers will be recorded.</p>
		Frog	House lizard
<p>1) Do they hatch from egg?</p> <p>2) How do they develop?</p> <p>3) Where do they live?</p> <p>4) What food do they eat?</p> <p>5) By which organ do they breathe?</p> <p>6) How many appendages do they have on the body?</p> <p>7) What is the distinct feature of the skin?</p> <p>8) How do they move?</p>			
<p>Teacher will explain the developmental stages of frog on the blackboard by showing pictures.</p> <p>Teacher will explain the developmental stages of house lizard by showing pictures on the blackboard.</p>	5	Picture chart.	<p>Teacher helps and explains that the animal whose larval stage and adult stage are different is called an amphibian.</p> <p>Explain that the animal that crawls on land is called reptile.</p>

Learning activities	Time	Teaching/learning materials	Points to be noticed
<p style="text-align: center;">Conclusion</p> <p>Students are asked to fill in again the name of animals they want to enter in the amphibian group and reptile group.</p> <p>Students will conclude.</p> <p>The general characteristics of amphibians are: (a) they usually hatch from egg (b) they live in water at the larval stage and breathe with gills. (c) they live on land after metamorphosis in the adlut stage. They usually go back into water to lay eggs. (d) the skin is moist.</p> <p>The general characteristics of reptiles are: (a) they usually crawl on land. (b) the skin is dry.</p> <p>Students copy their discussion and presented facts and recorded table inside the notebook.</p>	<p>7</p> <p>3</p>		<p>Teacher will conclude again.</p>

Lesson Plan 2-4

Lesson topic: Benefits from Animals
 Learning objectives: Be able to describe that some animals can benefit man

Teaching/learning materials:

Teaching period: 35 minutes + 35 minutes (2 period)

Teaching/learning procedure:

Learning activities	Time	Teaching/learning Materials	Points to be noticed
<p>Introduction</p> <p>Teacher gives a question to children. “Can human survive without other animals?” Children discuss in group for 5 minutes and present what they think?</p>	5		Students' answers will be recorded.
<p>After presentation, teacher may say, we will learn how human are related to other animals.</p>	5		Teacher does not have to say “can” or “can not”.
<p>Core/Development (refer to Activity 8)</p> <p>In order to carefully think about our relationship to other animals, we think about benefits from animals, harm from animals and harm to animals.</p> <p>For example, Benefits from animals are; To eat their meat, to use them as workforce, to produce milk and milk products, to produce leather and fur, to produce feathers, to produce medicine, and so on.</p> <p>For example, harms from animals are; To be killed, to become sick, to be injured, to be poisoned, and so on. Our agricultural products are damaged by them.</p> <p>For example, harms from human to other animals are; To deforest (damage the place for other animals live), to pollute environment (animal can not live), to capture too much, kill them for nothing or private business which is illegal. (tiger, elephant, other special animals)</p>	10		Students' outcome of discussions within group will be recorded.
<p>After mentioning examples, children in group select which topic they want to discuss. Then, we will discuss about the topic they selected. In the next lesson (1 period), children present the result of group discussion.</p>	15	Encourage children to use chalk and blackboard for the presentation.	Teacher better name the animals for each benefit and harm.
<p>Conclusion</p> <p>After presentation, teacher make sure with children the main point, that is It is important for children to realize that human greatly depended on other animals in many senses and also human and other animals occasionally harm each other.</p>	25		To think about the 3 rd topic is a little difficult but interesting.
	10		Try to cover 3 topics by groups.
			Teacher needs to write the main point on the blackboard.

Assessment

Point of Assessment

Interest/Attitude/ Motivation	Scientific thinking	Technique	Knowledge and understanding
Is s/he interested in animals?	Can s/he predict the answers?	Can s/he observe and compare the animals to find differences?	Does s/he understand that all animals can be categorized into vertebrate and invertebrate?
Is s/he motivated to think about characteristics of animals s/he knows?	Can s/he bring out the findings from experiment?	Can s/he use a magnifying lens?	Does s/he understand that animals are categorized with some commonalities?
Is s/he motivated to compare different groups of animals?	Can s/he find commonalities in animals in groups?	Can s/he draw what s/he observes?	Does s/he understand that human greatly benefits from other animals?
Is s/he interested in observing animals with a magnifying lens?	Can s/he think of close relation between human and other animals?	Can s/he find benefits from animals in her/his life?	
Does s/he realize that human can often harm other animals?		Does s/he have the ability to listen to what others present?	

Oral Assessment/Group Discussion

1. Describe the names of vertebrates and invertebrates.
2. Explain the difference of vertebrate and invertebrate.
3. Does any insect which has back bone exist?
4. Describe the main characters of mammals.
5. What is the commonality between birds and mammals?
6. Mention the main characteristics of fishes.
7. Why do you think animals are very important for human?

Written Assessment

1. Spider, Beetle, Butterfly, Newt, Mosquito, Octopus. Which is vertebrate among them? And explain why you think so.
2. There is animal named X, which hatches eggs, has feather, live in water and on land as well. What kind of animal can X be? Explain why you think so.
3. Mention 5 animals which you think very dangerous to human.
4. Why is a dog categorized as mammal? Explain
5. What is very special about amphibians compared to others?

Message to Teachers

1. Children are able to differentiate animal groups with the presence or absence of back bones.
2. Children are able to bring out the characteristics of amphibians and reptiles.
3. Help and direct the children to understand properly that mammals are included in warm blooded group.
4. Give questions for which children need to think and reflect to answer.

Topic 3: Plants

1. Key concept	There are cultivated plants and wild plants in our environment Plants have specific structure with particular function
2. Learning objective	
General Objectives	<ol style="list-style-type: none"> 1) To be able to know that there are both domestic and wild plants, for example: there are plants we grow for food and those that are not harvested. 2) To be able to acquire that plants have its own specific structure 3) To be able that particular parts of plants have its own function 4) To be able to know that plants can be used in our life
Specific Objectives	<ol style="list-style-type: none"> 1) To be able to identify plants either cultivated or wild have specific structure 2) To be able to acquire that plants store their food in their parts. 3) To be able to describe that plant contains edible parts. 4) To be able to describe that parts of some plants are useful for medicinal purpose. 5) To be able to describe that parts of some plants are used in the constructing shelter(building) 6) To be able to describe that some plants store their food in their parts.
3. Activities involved	Observation Record keeping Growing plants Discussion Presentation
4. Activity purpose	To let children find out function of the particular parts of variety of plants and growing plants in real

Before Getting Started

Self-check list for Teachers	<input type="checkbox"/> How many domestic plants do you know? <input type="checkbox"/> Am I clear about plants structure <input type="checkbox"/> Can I distinguish plants parts and its function?
Background information for teachers	
Roots	Roots hold the plant fast in the ground, like anchors. They absorb water and mineral salts from the soil through fine hairs. A cap protects the root as it pushes down through the soil in search of water.

Stem The stem supports the leaves and flowers. Inside are tubes which carry and store water and food. When these tubes are filled with water they are very strong; when they are dry, they become weak and the plant wilts. Tree wood is really a mass of stiffened tubes.

Leaves Leaves are the plant's food-making factories. Their cells contain chlorophyll, which uses the Sun's energy to make food from carbon dioxide gas in the air and water. Veins carry water from the roots and move food made in the leaves to the rest of the plant.

Flowers In many plants, flowers are the reproductive parts. Most flowers have male and female organs. The male part makes pollen, which pollinates the female part (usually on another flower). This pollination produces a seed, from which a new plant can grow. Some plants spread their pollen from plant to plant using the wind. Others use insects and other animal to carry it for them. Some flowers grow in form of clusters. Many have dazzling colors and strong scents but some are dull-colored and even do not smell.

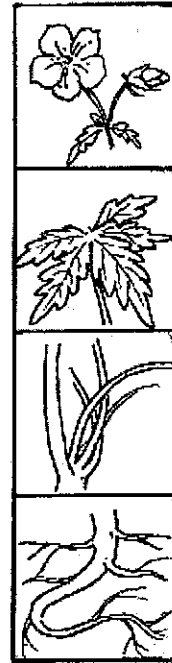
Parts of medicinal plants Cultivated plants and wild plants contain medicinal plants. Out of these plants, only the fruits or seeds, the root, the leaves, and the stem of some plants have medicinal properties whereas some have medicinal properties in all the five parts of the plant. The fruits, root, leaves and stems of medicinal plants contain in page 12 of Basic science text of grade four are supplemented by other medicinal plants and their medicinal properties are from and described in the following table.

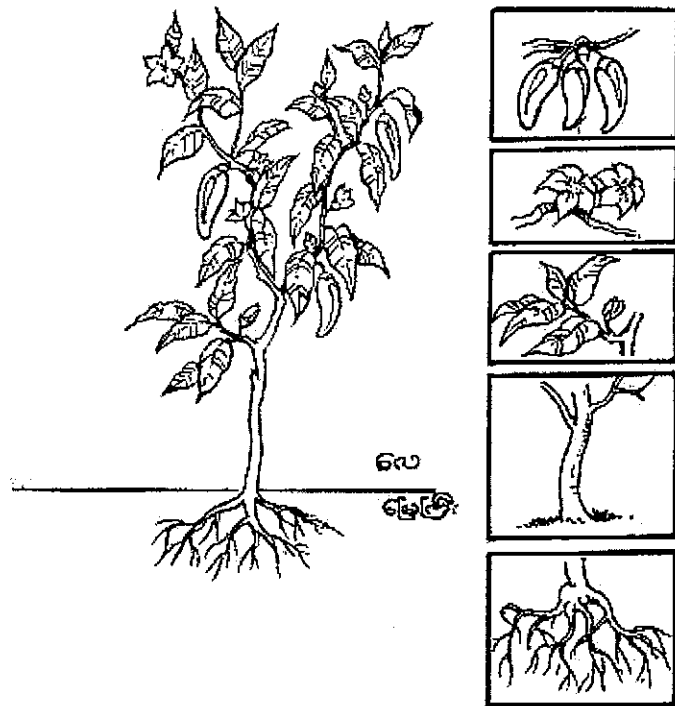
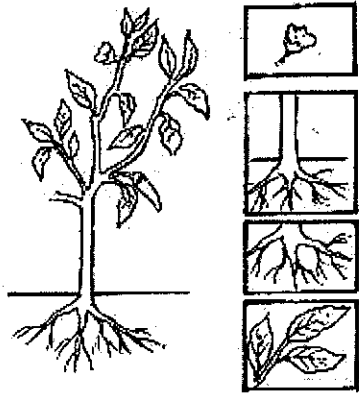
No.	Name of plant	Parts	Medicinal property
1	Bay tree	Fruit	It can cure diseases caused by blood, wind or gas in the body and phlegm such as cough.
2	Kalaw	Fruit	It can treat leprosy, diseases due to heat and vomiting. It can remove the abnormalities due to blood, wind or gas and phlegm
3	White pumpkin	Fruit	By drinking the juice, it can cure bleeding, vomiting of blood and distension of blood. It is also used in epilepsy, flatulence and mania.
4	Castor oil plant	Fruit	It has laxative effect when the oil is drunk.
5	Pepper	Fruit	When the powder is mixed with honey and lick it can cure cough and asthma. When it is put in the soup and drink it can cause lactation in mothers.
6	Aniseed	Fruit	If eaten phlegm and wind or gas are destroyed. It can cure cough and vomiting. If mixed with boiled water and have the child drink it can cure indigestion and gastritis.
7	Eastern goose-berry	Fruit	It can extend life if eaten. It can cure cough, asthma, and tympany. The juice after grinding when drink by mixing with limejuice can cure immediately the dysentery.
8	Nut meg	Fruit	If the seed is ground and apply on a pimple it will shrink if the pimple is earlier and the pimple is cured if it is older. It is an important item in making medicine for rheumatic complaints of male, and menstrual disorder.
9	Long pepper	Fruit	It can deworm when the powder is drunk with water. When ground and apply on the sites where poisonous creatures bite, it can remove the poison.

No.	Name of plant	Parts	Medicinal property
1	Indian nightshade	Root	If ground on stone slab and pasted on teeth, it can relieve toothache. If drunk after grinding with rice water, it can cure nose bleeding.
2	Himalayan gentian	Root	It can be used for deworming, digestion and strength. It can cure in case of becoming mentally unhinged.
3	Screw-pine	Root	It can relieve the bad odors of hair and body. It can extinguish the wind or gas, phlegm and defect in one of the essential humors of the body.
4	Toddy palm root (Germinated root of toddy palm seed)	Root	It can remove the abnormalities caused by blood and bile.
5	Turmeric	Root	It can cure various diseases. It can be used in formulating medicine for fever with attendant delirium, medicine for eye, medicine for diarrhea, various kinds of lotion. It can be free from disease and be healthy for women at the time of giving birth to a child, during or after the time of post-natal confinement in a sauna-like chamber by drinking or applying on the body the mixture of turmeric powder and water, or by inhalation of smoke of turmeric powder, or by taking a bath with boiling turmeric with water.
6	Rauwolfia	Root	It is very famous as anti-hypertensive drug. It is suitable for the person who has hypertension together with anxiety and rapid heart beating. It is used in formulating carminatives and detoxifiers.
7	Minkokar (Climber with bell-shaped flowers and betel-like leaves) <i>Argyreia barbegera</i>	Root	It is used in formulating medicine for loose bowels, tonics, medicine for menstrual disorder, Lay-myo-shit-sal (effective medicine for wind or gas) (carminatives)

No.	Name of plant	Parts	Medicinal property
1	Red Convolvulus (Lelkanzwaun that grows in paddy field)	Leaf	When drinking the extract, it can cure burns, disease of thirst, fever relating with urine. Drinking after boiling it water can cure surfeit and diarrhea.
2	Bay leaf	Leaf	Its powder is used in formulating medicine for digestion.
3	Kin boun <i>Coccinia indica</i>	Leaf	The person who is suffering from diabetes has to eat after cooking the leaves (fry first and then simmer in stock). It can also be used in formulating antihelmintics. By applying the extract of leaf on the herpes frequently, it can be cured.
4	Betel leaf	Leaf	By drinking the mixture of jaggery, ginger, and salt and betel leaf after boiling with water, fever due to excess of heat can be cured. When stick the toasted betel leaf with coconut palm oil on the fontanel of the baby, catching cold can be cured.
5	The chaste tree Vitex trifolia	Leaf	When drink boiled leaf, malaria and fever during the post-natal confinement in a sauna-like chamber can be cured. By applying mixture of the extract of leaf and sesame oil with a feather into the ears, shedding pus and earache can be cured.
6	Gwaydauk Dregea volubilis	Leaf	When stick the toasted leaf, boil or abscess can be shrunk in case of early stage and it can be ruptured and pus can flow out in case of ripening and will get healing.
7	Neem tre	Leaf	Brushing teeth with the mixture of salt and Neem leaf being roasted until burnt up can make to be free from toothache. Applying the ground leaf can cure scabies and abscess.
8	Senna	Leaf	Drinking powder can make free from constipation and it can make hungry.

No.	Name of plant	Parts	Medicinal property
1	Bastard sandalwood Masonia gagei	Stem (wood)	Applying the concentrate solution obtained from grinding it on the skin can make the body cool and relieve itching. Drinking this concentrate solution can cure the cardiac disease and urine disease.
2	Teak	Stem	Applying the concentrate solution obtained from grinding it relieves edema. Applying frequently the solution obtained from grinding teak –coal with rice liquid can relieve herpes.
3	Nalingyaw Cinnamomum obtusifolium	Stem	Applying the solution obtained from grinding it together with salt can relieve pain or swelling due to biting by centipede, scorpion or spider, body aches, itching and swelling with rashes. Drinking or applying it after grinding can cure delirium accompanying high fever resulting from fever, being exposed to smells of burning or frying, and septic sore.
4	Sandalwood	Stem	Applying by grinding it can relieve stiffness and aches, seborrhoeic dermatitis of the scalp and impetigo. Disorder due to excessive heat and hiccapping can be cured by drinking the mixture of concentrated solution obtained by grinding and sugar block.
5	Liquorices	Stem	Root can also be used. When chewing it, it is sweet and cold. It can make skin and hair good. It can affect on wind or gas in the body and bile. It can cure vomiting of blood and hypotension. Powder is used in various kinds of indigenous medicine.
6	Gum-Kino tree	Stem	When grind and apply it, injury, cut, pain and aches can be relieved.
7	Myrobalan tree	Stem	When boil the bark with water and drink, diarrhea and dysentery can be cured. When paste the bark after grinding, excessive bleeding can be stopped.
	Thanakha	Stem	When grind the bark and apply or drink it, body feels cool, skin is smooth and body odor is fragrant. When paste the concentrated lotion, pimple can be relieved.





Lesson Planner

Suggested period (11)	Period 1 and 2	Period 3	Period 5
Lesson topic	Cultivated Plants and Wild Plants	Food storage plants 1	Eatable Plants
Sample lesson plan		3-1	
Specific objective	To be able to identify plants either cultivated or wild have specific structure.	To be able to acquire that plants store their food in their parts.	To be able to describe that plant contains eatable parts.
Introduction <i>(Motivation/Create interest/Active knowledge)</i>	Activity (1) Let children observe the collected cultivated plants and wild plants, and then they have to identify which are cultivated plants and which are wild ones.	Activity (2) (a) Recall prior knowledge from the previous lesson by asking them the general parts of wild and cultivated plants. Showing ginger, potato, onion and sweet potato/radish and let them observe.	Activity (3) Recall the prior knowledge of plants parts and let them think which part of a certain plants is edible part.
Core/Development <i>(Active engagement with test/task)</i>	List cultivated plants they know, differentiate the parts, such as root, stem, leaves, branches, flower, seed, etc. List wild plants they know and differentiate the parts, such as root, stem, leaves, branches, flowers, fruit, seed, etc.	Let the children guess which parts of plants they are. (Keep totally) Put them all into the saucer and fill with water. Let them in this condition for a few days and observe until 2 weeks, to record the changes and fill in the table.	Ask the children to think the name of edible plants, and which parts of them are edible. Discuss with them. Have them fill in the table the edible parts of plants based on its parts such as Root (-) (-) (-) Leaf (-) (-) (-) Stem (-) (-) (-) etc.
Assessment points	Do they participate in learning process such as; Observing plants? Identifying plants, wild or cultivated? Plants have their own structure root, stem, leaf, flower, and fruit? Do they understand plants parts and their structure?	Do they participate in learning process such as; Observing ginger, potato, onion, and sweet potato/radish? Guessing which parts of them they are? Expressing their ideas which parts of plants they are? Can they handle the material well while doing the experiment?	Do they participate in learning process such as; Thinking on edible parts of a certain plants? Filling the edible parts in the given table based on its parts Do they understand what edible part of a plant is? Can they identify which part is edible of a plant?

Lesson Planner

Suggested period	Period 6	Period 8	Period 9	Period 4 7 10 11
Lesson topic	Medicinal Plants	Plants as construction material	Food storage plants 2	Assessment/ Review
Sample lesson plan		3-3	3-2	
Specific objective	To be able to describe that parts of some plants are useful for medicinal purpose.	To be able to describe that parts of some plants are used in the constructing shelter (building)	After two weeks from the first period, To be able to describe that some plants store their food in their parts.	
Introduction (Motivation/Create interest/Active prior knowledge)	Activity (5) Teacher gives message on some herbals and their medicinal properties mentioned in Background information.	Activity (6) Recall the prior knowledge from the previous lessons parts of some plants are edible, some are useful for medicinal purpose and anything else? Let them think	Activity (2) (b) Showing the experimental ginger, potato, onion, sweet potato/radish, asks children which parts of plants are they? Tell them what they want to amend they guessed 2 weeks ago.	
Core/Development (Active engagement with test/task)	Ask the children to think on the name of herbal medicine first. Let them acquire from which part of plants it is formulated and the medicinal properties they know. While thinking, let them discuss with each other and after getting consensus, let them fill in the table.	List cultivated plants they know, differentiate the parts, such as root, stem, leaves, branches, flower, seed, etc. List wild plants they know and differentiate the parts, such as root, stem, leaves, branches, flowers, fruit, seed, etc.	Ask children to present the recorded table of changes by group. Synthesizing the presented facts by teacher and students collectively.	
Assessment points	Do they participate in learning process such as; Thinking on the name of herbal medicine, how they are formulated and their properties? Do they discuss with each other and share their idea? Do they get consensus with others or are they doing alone? Do they understand parts of some plants are useful for medicinal purpose?	Do they participate in learning process such as; Observing plants? Identifying plants, wild or cultivated? Plants have their own structure root, stem, leaf, flower, and fruit? Do they understand plants parts and their structure?	Do they participate in learning process such as; Expressing their ideas, Synthesizing the facts and making conclusion. Do they understand plants store food in their parts?	
Adaptation of curriculum	Any activity, which is related to parts of plants or plant structure as activity 4, can be given as homework as much as possible.			

Activity 1 Observation on the parts of Cultivated plants and Wild plants

Teaching/learning material

Cultivated plants and wild plants in environment

Concept

Plants either cultivated plants or wild plants have specific structure of their own.

Have the children make a list of cultivated plants they know.

Then, ask them to differentiate the parts of these cultivated plants.

Have the children make a list of wild plants they know.

Then, ask them to differentiate the parts of these wild plants.

Activity 2 (a) Parts for Food Storage of Plants

Teaching/learning material:

Ginger, potato, onion, sweet potato or radish, saucer or beaker, glass, water

Concept Plants store their food in their parts.

By showing ginger, potato, onion, and sweet potato or radish, ask the children to tell what parts of a plant they are. (Guessing)

Name	Which Parts of the Plant				
	Stem	Leaf	Fruit	Flower	Seed/grain
Potato	?				
Ginger	?				
Onion	?				
Sweet potato/Radish	?				

Keep tally of the guessing of the children. Do not tell whether it is right or wrong.

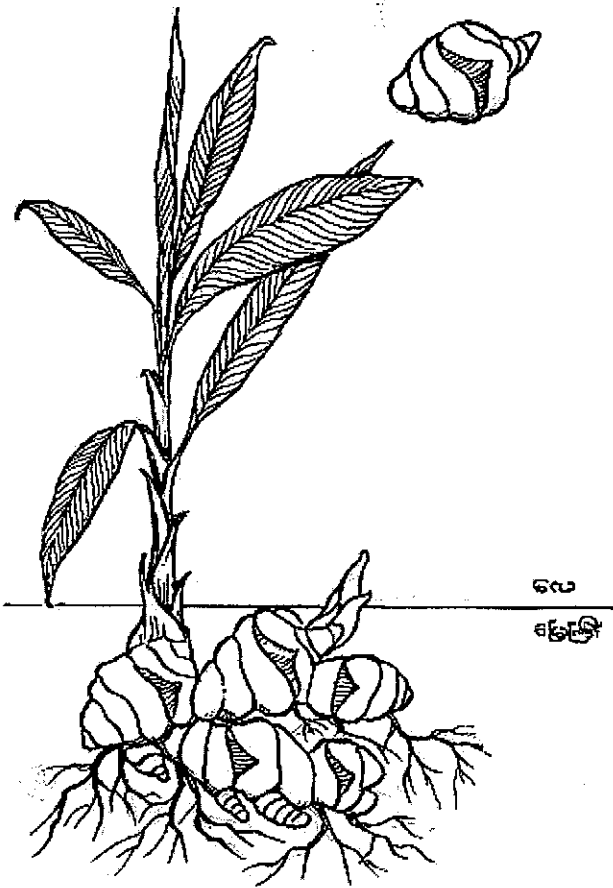
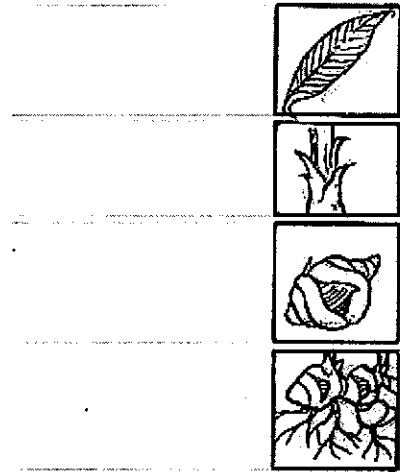
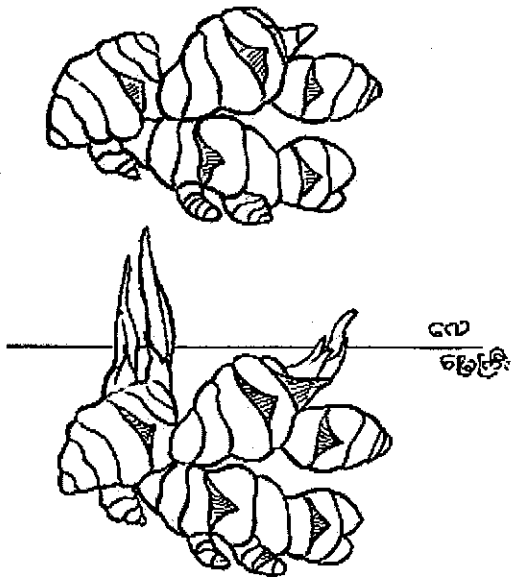
Put the ginger, potato, and sweet potato or radish into the saucer and fill with water as shown in the figure.

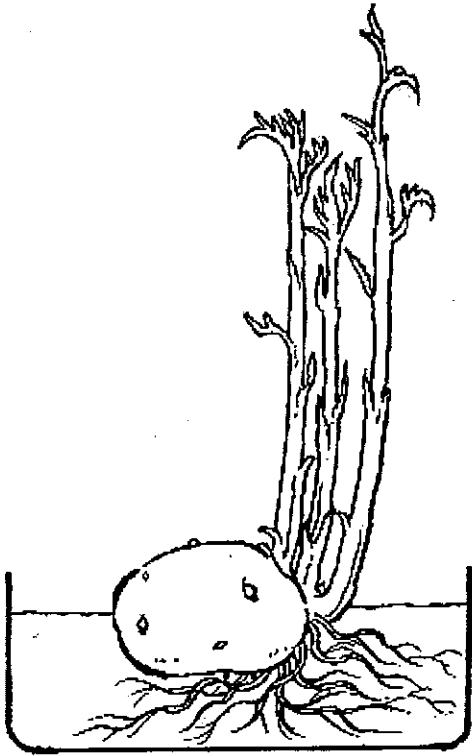
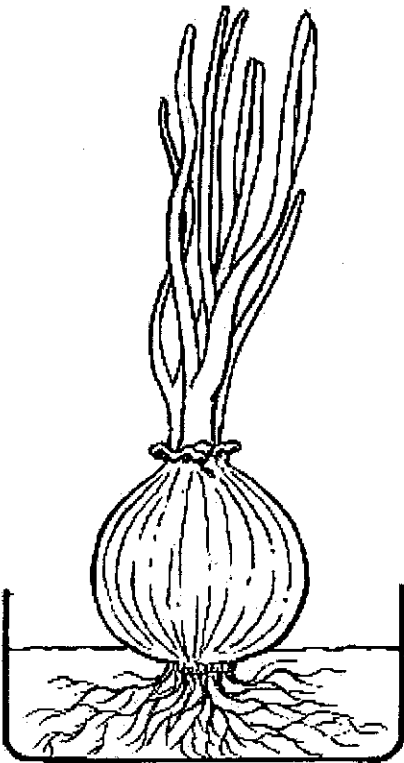
Put the onion into the glass and fill with water as shown in the figure.

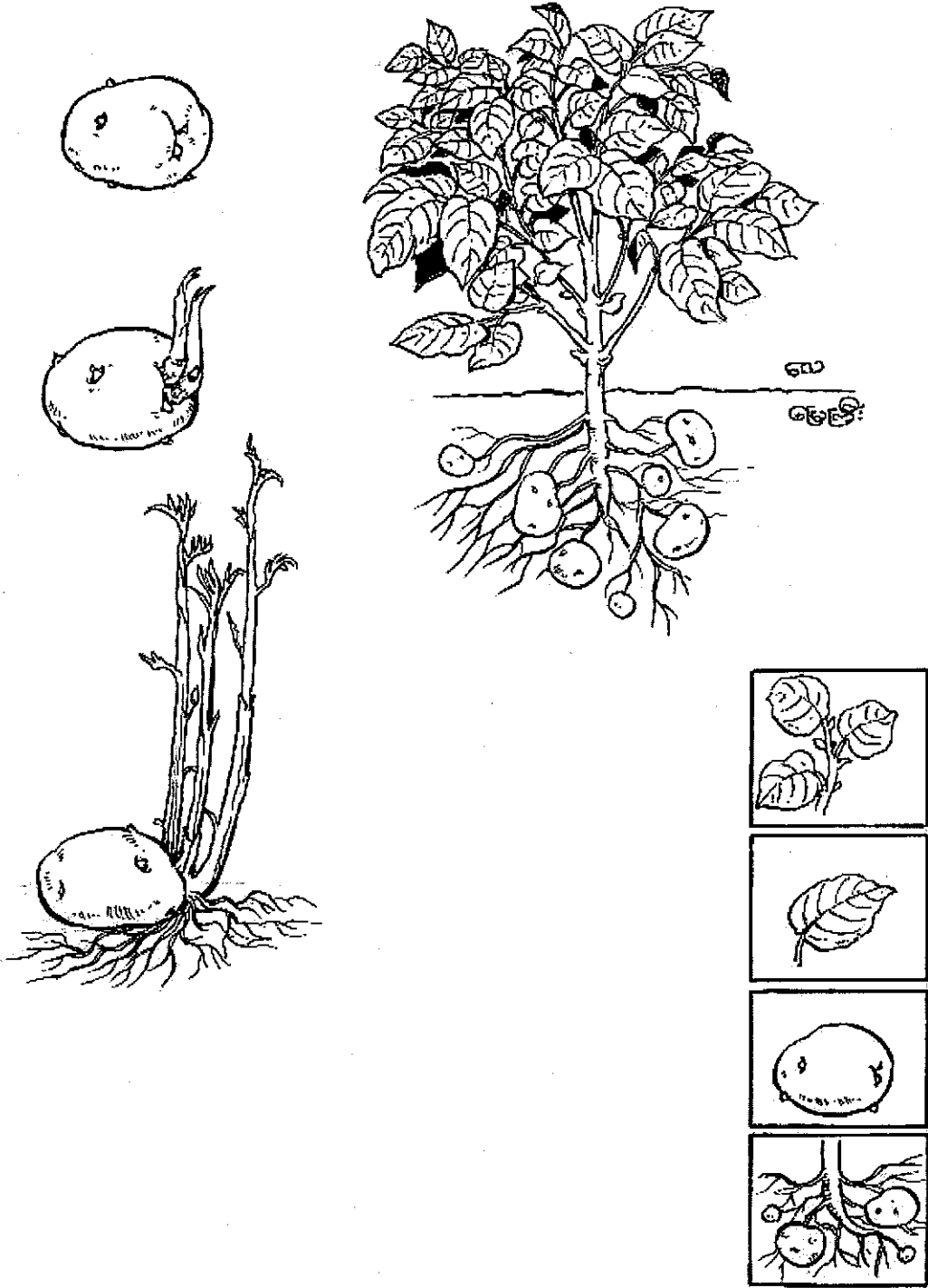
Let it in this condition for a few days. Fill water if necessary. Ask them to record the changes in the following table. Observe what will happen until two weeks long.

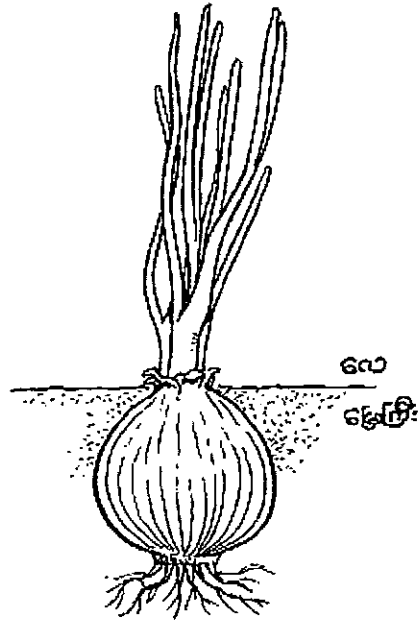
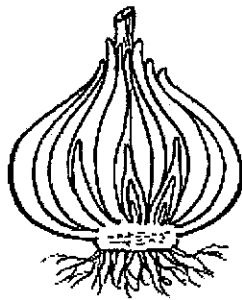
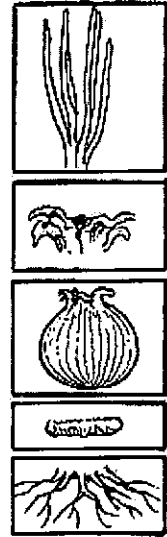
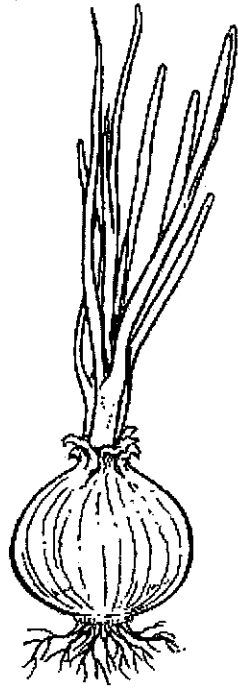
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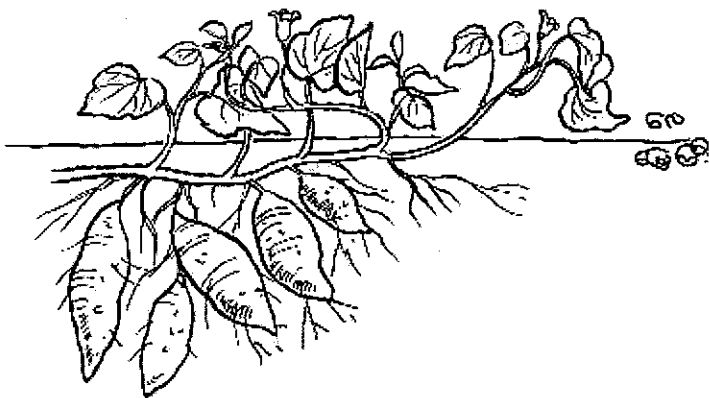
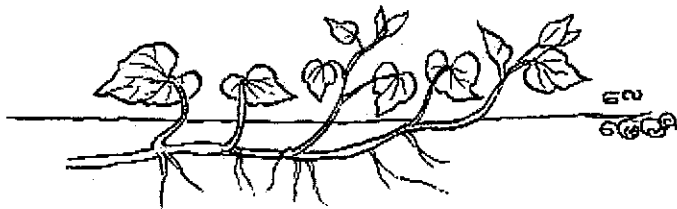
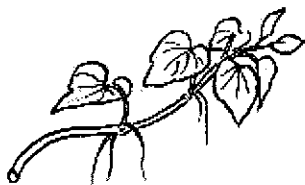
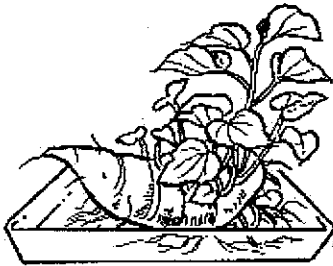
Name	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Ginger							
Potato							
Onion							
Sweet potato /Radish							

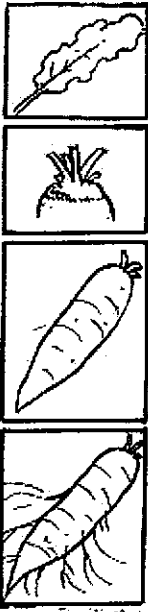
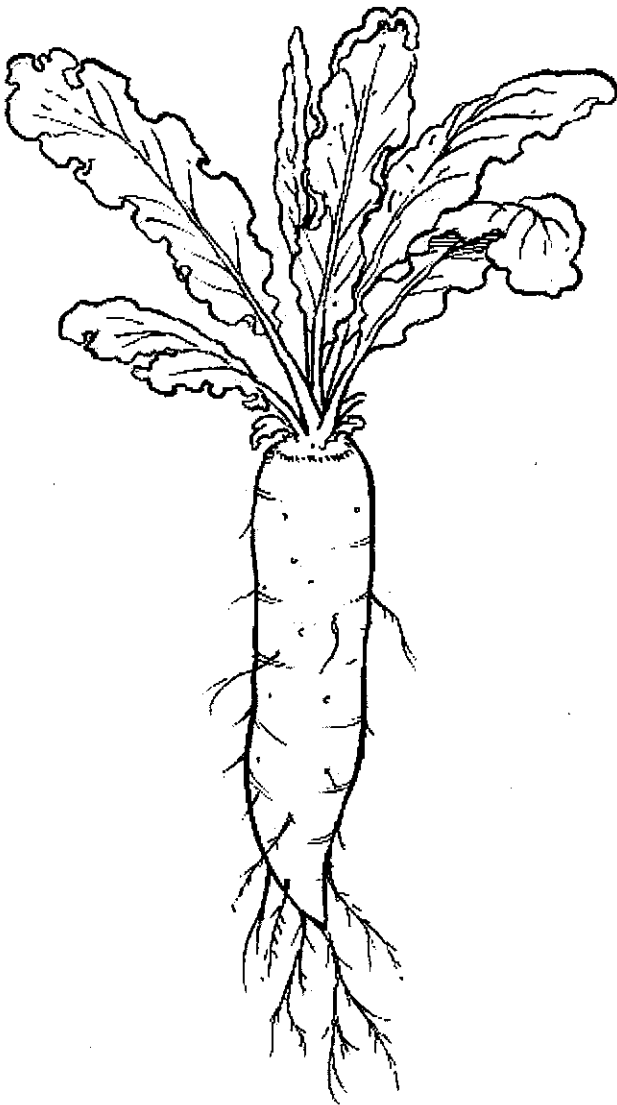


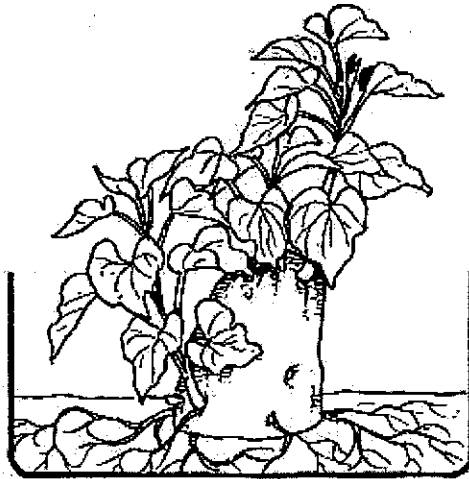












Activity 2 (b) Parts for Food Storage of Plants

Teaching/learning material:

Ginger, potato, onion, sweet potato or radish, saucer or beaker, glass, water

Concept Plants store their food in their parts.

Two weeks later

Presentation of changes record table (Student)

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Synthesizing the presentations (Teacher-Students)

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Ask the students to fill in the following table again according to synthesizing.

Name	Which part it is	Reason of why it is this part
Ginger		
Potato		
Onion		
Sweet potato /Radish		

According to the table,

Conclusion

Different plants store their food in their various parts.

Activity 3 Parts of a edible plant

Teaching/learning material

- Edible grains such as grains of groundnut, sunflower, etc.
 - Edible fruit such as guava and mango etc.
 - Edible flower such as cauliflower and Malarfu (aromatic flowering herb used as a vegetable (*Hitchenia glauca*) etc.
 - Edible leaves such as water convolvulus, Roselle leaf, etc.
 - Edible stems such as sugar cane, stem of water lily etc.
 - Edible roots such as radish, sweet potato etc.
- (Two kinds of samples have to be prepared for the children to start thinking)

Concept Plants contain edible plants.

Have the children think about the edible parts of plants and fill in the following table.

Seed/grain	Groundnut	Sunflower			
Fruit	Guava	Mango			
Flower	Cauliflower	<u>Malarfu</u> (<i>Hitchenia glauca</i>)			
Leaf	Water convolvulus	Roselle			
Stem	Sugar cane	Stem of water lily			
Root	Radish	Sweet potato			

According to the table,

Conclusion

Plants contain edible parts.

Activity 4 Making a list through observing different edible parts of plants. (Homework)**Teaching/learning material :**

Market in ward, attached table and pencil

Concept Plants contain different edible parts

Go to the market in your ward and observe the vegetable –stall. Fill in the table according to the edible part. (Ask the owner if you are not sure which part it is.)

Sample table

Name of plant	Edible part	Name of plant	Edible part	Name of plant	Edible part
Tomato	Tomato (Fruit)	Radish	Radish (root)	Mahlwa	Flower of Mahlwa
Egg plant	Egg plant (Fruit)	Indian leek <i>Allium tuberosum</i>	Root of Indian leek	Trumpet flower <i>(Dolichandrone spathacea)</i>	Trumpet flower
Bean	Long bean (Fruit)	Bean	Edible tuber of winged bean	Pumpkin	Flower of Pumpkin
Water convolvulus	Water convolvulus (Leaf)	Bamboo	Bamboo shoot (Stem)	Groundnut	Groundnut grain
Acacia	Acacia leaf	Water lily	Stem of Water lily	Lablab bean	Lablab bean grain
Gourd	Tendrill of gourd (Leaf)	Taro	Taro (Stem)	Corn	Corn grain

According to the table,

Conclusion

Plants contain different edible parts.

Activity 5 Parts of the Herbs

Teaching/learning material :

Nutmeg, Kalaw fruit, Long pepper, Pepper, Screw-pine, Gentian, Bay leaf, Toddy palm root, Rauwolfia root, Senna leaf, Bay leaf, Betel leaf, Thanakhar, Licorice, Nalinyaw ((*Sinnamomum obtusifolium*), Bastard sandal wood, Sandal wood, Table of parts of some herbage their medicinal properties presented by Sayagi U Tha Nyunt in *Pyinnyadazaung Magazine*

Concept Parts of some plants are useful for medicinal purpose.

Teacher has to explain the parts of the herbs contained in the page 12. (Sayagi U Tha Nyunt’s table of parts of some herbal plants and their medicinal properties mentioned in the Background Information can be used as a reference for explanation)

Then, ask the children to think about and fill the name of herbal medicine one has ever used before; it is formulated from the parts of which plant; it has what medicinal property etc. in the table.

Name of the herbal medicine	Which parts	Medicinal properties
Kuam Ywet Pone	Betel leaf	For relieving cough
Na lin Gyaw (<i>Sinnamomum obtusifolium</i>)	Stem	For relieving pain and aches

In accordance with the table,

Conclusion

Parts of some plants are useful for the medicinal purpose.

Activity 6. How else can parts of plants be used?

Teaching/learning material:

Building and houses in environment

Concept Parts of some plants are used in the constructing shelter (building).

It has been already known that parts of plants are edible and have medicinal properties. Have the children think where else parts of plants are used and fill in the following table.

Name of plant	Parts	Usage
Toddy Palm	Leaf	Roof
Teak	Stem	Pole

According to the table,

Conclusion

**Parts of some plants are used in constructing shelters
(Building)**

Lesson Plan 3-1

Lesson topic: Food storage plants 1
 Learning objectives: Be able to acquire that some plants store food in their parts
 Teaching/learning materials: Ginger, potato, onion, sweet potato or radish, saucer or beaker, glass and water
 Teaching period: 1 period
 Teaching/Learning procedure

Learning Activities	T	Teaching/Learning Materials	Points to be noticed																																																																												
<p style="text-align: center;">Introduction</p> <p>Introduce the lesson by asking the general parts of wild plants and cultivated plants learned in the previous lesson already.</p> <p style="text-align: center;">Development Activity (2A)</p> <p>Distribute ginger, potato, onion, and sweet potato (or) radish to the children. Ask them to observe carefully.</p> <p>Have the children guess which part of plant the things in their hands are.</p> <table border="1" data-bbox="248 1249 773 1515"> <thead> <tr> <th rowspan="2">Name of plant</th> <th colspan="6">Which parts of plant</th> </tr> <tr> <th>Stem</th> <th>Root</th> <th>Leaf</th> <th>Flowe</th> <th>Fruit</th> <th>Seed</th> </tr> </thead> <tbody> <tr> <td>Ginger</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Potato</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Onion</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Sweet potato</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>Keep tally. Do not tell if whether it is correct or not. Tell them they will have to do practically in order to check if their guesses are correct or not.</p>	Name of plant	Which parts of plant						Stem	Root	Leaf	Flowe	Fruit	Seed	Ginger							Potato							Onion							Sweet potato							<p>5</p> <p>2</p> <p>3</p> <p>10</p>	<p>Lists complied with the previous lesson</p> <table border="1" data-bbox="915 807 1495 1109"> <thead> <tr> <th>Name of plant</th> <th>Stem</th> <th>Root</th> <th>Leaf</th> <th>Flower</th> <th>Fruit</th> <th>Seed</th> </tr> </thead> <tbody> <tr> <td>4 months plant</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Wild coffee</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>Ginger, Potato, Onion, Sweet potato/radish</p>	Name of plant	Stem	Root	Leaf	Flower	Fruit	Seed	4 months plant							Wild coffee																					
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Learning Activities	T	Teaching/Learning Materials	Points to be noticed
<p>Put ginger, potato, sweet potato or radish in the saucer and fill with water as shown in figure. Put the onion in the glass and fill with water as shown in figure. Tell them this experiment will have to be observed till 2 weeks long. Ask them to fill in the record of changes daily. Remind them to fill up the water if necessary.</p>	12	Ginger, potato, sweet potato or radish, onion, saucer, water, glass	

Name	Date		Date		Date		Date		Date		Date	
	text	fig.	text	fig.	text	fig.	text	fig.	text	fig.	text	fig.
Ginger												
Potato												
Onion												
Water convolvulus												

<p>Ask the children to put the experimented materials orderly in the corner.</p> <p style="text-align: center;">Conclusion</p> <p>Teacher tells, "In today lesson, you have already guessed which part of plant ginger, potato, onion and sweet potato are and experiments have been carried out to verify the guesses as well. It is necessary to observe continuously. This lesson will have to be discussed again two weeks later.</p>	3		
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Lesson Plan 3-2

Lesson topic: Food storage plants 2
 Learning objectives: Be able to describe some plants store food in their parts
 Teaching/learning materials: Experimented ginger, potato, onion, sweet potato (or) radish, and table of changes record
 Teaching period: (1) period
 Teaching/Learning procedure

Learning Activities	T	Teaching/ Learning Materials	Points to be noticed																																																																											
<p>Introduction</p> <p>Ask the students, "Which parts of plants are the gingers, onion, sweet potato or radish that has been experimented last two weeks ago. Tell them to amend what they guessed if they wish after the experiment for the time being.</p> <p>Making amendment on what they guessed</p> <p>Development</p> <p>Have the children present the recorded table of changes by group.</p> <div style="border: 1px solid black; width: 200px; height: 60px; margin: 10px 0;"> <p style="text-align: center;">-</p> <p style="text-align: center;">-</p> <p style="text-align: center;">-</p> </div> <p>Synthesizing the presentations by teacher and students collectively</p>	5 10 15	<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th rowspan="2">Name of plant</th> <th colspan="6">Which parts of plant</th> </tr> <tr> <th>Stem</th> <th>Root</th> <th>Leaf</th> <th>Flower</th> <th>Fruit</th> <th>Seed</th> </tr> </thead> <tbody> <tr> <td>Ginger</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Potato</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Onion</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Sweet potato</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>Spouted ginger, potato, onion, sweet potato and record tables</p> <p>record tables</p>	Name of plant	Which parts of plant						Stem	Root	Leaf	Flower	Fruit	Seed	Ginger							Potato							Onion							Sweet potato							<p>Ginger</p> <ul style="list-style-type: none"> ● Yellow sprout comes out after one week approximately. White newly adventitious root comes out after around 10 days. ■ About two weeks later, yellow sprout changes into green shoot. <p>Remark</p> <p>It is necessary to tell ginger is underground-modified stem where food is stored.</p> <p>Potato</p> <ul style="list-style-type: none"> ● One week later, yellow sprout rises. White root comes out about 12 days. ■ After around 14 days, green leaves come out. <p>Remark</p> <p>Explain it is an underground-modified branch where foods are stored.</p>																																		
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Learning Activities	T	Teaching/ Learning Materials	Points to be noticed
<p>Conclusion Review the Synthesized facts as follows: Ginger is the underground stem, which stores food. Potato is the branch that stores food underground in spite of having other parts. Onion has other parts, however, it stores food in leaf. Although sweet potato has other parts, it stores their food in the underground-modified root. Therefore,</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p>Plants store their food in their parts.</p> </div>	<p>5</p>		<p>Onion</p> <ul style="list-style-type: none"> ● One week later, white root comes out. ■ Green shoot rises after two weeks approximately. Ask them to observe the base part carefully. The part of stem will be seen. It is necessary to explain it is a modified leaf. <p>Sweet potato</p> <ul style="list-style-type: none"> ■ Reddish brown sprout comes out and brown root branches rise. Leaf and stem are also seen well. Explain it is a modified root.

Lesson Plan 3-3

Lesson topic: Plants as construction material
 Learning objectives: Be able to describe that parts of plants can be used in buildings
 Teaching/learning materials: Building and houses surrounding
 Teaching period: 35 Minutes
 Teaching/Learning procedure

Learning Activities	Time	Teaching/ Learning Materials	Points to be Noticed																					
<p style="text-align: center;">Introduction (refer to Activity 1)</p> <p>Ask the children to tell about the parts of plants that can be eaten and medicinal plants from the previous lesson.</p> <p style="text-align: center;">Development</p> <p>Let the children tell among one another with what materials the houses and buildings in the environment are built.</p> <p>Then let the children fill in their experiences in the following table according to groups based on the discussions.</p> <table border="1" data-bbox="332 1224 852 1462"> <thead> <tr> <th>Name of plant</th> <th>Which part</th> <th>Uses</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table> <p>Then the facts filled in the table according to groups have to be explained by a group leader. The remaining groups have to listen while the leader of one group is explaining.</p> <p style="text-align: center;">Conclusion.</p> <p>It is to review that the parts of some trees are used in houses and buildings. Ask the children to write the above table in the notebook.</p>	Name of plant	Which part	Uses																			<p>5</p> <p>10</p> <p>15</p> <p>5</p>		<p>They will recall the lessons taught by making them retell.</p> <p>Record the children's saying on the blackboard. It is necessary to ask leading questions to contain in the children's saying the building materials made from bamboo and wood.</p> <p>The remaining groups have to supplement and discuss on the presentation of the first group.</p>
Name of plant	Which part	Uses																						

Assessment

Point of Assessment

Interest/Attitude/ Motivation	Scientific thinking	Technique	Knowledge and understanding
Does s/he take interest in the study of plants?	Does s/he able to relate the separate organization of the organs and parts of wild plants and cultivated plants?	Is s/he able to carry out the activities? (Recording the record of study of plants)	Is s/he able to understand the separate organization of the organs and parts of wild plants and cultivated plants?
Is s/he motivated to learn in relation with plants?	Does s/he able to relate and think the separate organization of the organs and parts of wild plants and cultivated plants?		Is s/he able to understand the relationship of the separate organization of the organs and parts between the wild plants and cultivated plants?
Does s/he like to study about plants?			

This lesson contains many observations.

Achievement can be assessed by the skills of children in observation.

- test the attitude of children.
- test the activity of children

- List and record the cultivated plants.
- Record the separate organs and parts of cultivated plants.
- Observing the nature.
- Observing the cultivated plant.
- Observing the organization of parts of cultivated plant.
- Observing the wild plant
- Observing the organization of parts of wild plant.

Oral assessment/Group discussion

- Can you tell the wild plants?
- Can you tell the cultivated plants?
- Can you tell the separate organization of the parts of a wild plant?
- Can you tell the separate organization of the parts of a cultivated plant?

Written assessment

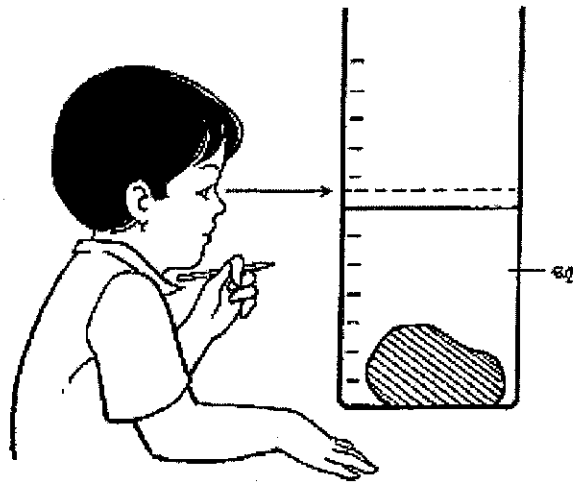
- What difference is found between cultivated plant and wild plant?
(Children can use their studying records)
- Can you explain the separate organization of the organ and parts of wild plant and cultivated plant?
(Children can use their studying records)

Message to Teachers

1. Interested in observing wild plants and cultivated plants.
2. Observing correctly the various facts by using the five senses.
For example, (the size of wild and cultivated plants), the regions grown, the separate organization of plant parts, their color, size, shape, touch etc.

Grade 4

Chapter 2 Matters



Topic 4 : Matters in environment

1. Key concept	Matter can be weighed and its volume can be measured.
2. Learning objective	
General	To be able to measure the weight and volume of solids and liquid
Specific	<ol style="list-style-type: none"> 1) To be able to explain that liquid takes some space in the empty glass. 2) To be able to explain that volume of liquid can be measured by measuring cylinder 3) To be able to explain how to measure irregular shape of solid. 4) To be able to describe that the weights of the different solids, which are the same in size, are different. 5) To be able to explain that the volumes of the different solids, which are different in weight, can be the same.
3. Activities involved	<ol style="list-style-type: none"> 1) Find out that liquid takes some space in the glass. 2) Find out that volume of liquid can be measured by measuring cup or cylinder. 3) Listen to the story and think how to measure the irregular shape of solid. 4) Measuring weight by hands. 5) Calculate the volume of metal and wooden blocks. 6) Acquire that the rising of water levels are same because they have same volume.
4. Activity purpose	To let the children understand how to measure weight and volume of solid.

Before Getting Started

Self-check list for Teachers	<input type="checkbox"/> Do I understand how to measure weight and volume of solids with regular and irregular shape? <input type="checkbox"/> Can I explain clearly, how to measure weight and volume of solids with regular and irregular shape?
Background information for teachers	
Solid	There are two kinds of solids, regular and irregular shape.
Weighing solid	By using balance and weight box, we can measure the weight of solid.
Measuring the volume of solid with regular shape.	Solids with regular shape have definite length, width, height and diameter.
Measuring the volume of solid with irregular shape.	Solids with irregular shape have no definite length, width, height and diameter.

Calculating the volume of solid with regular shape

The volume of solid with regular shape can be calculated through measuring length, width and height with ruler.

$$\text{Volume} = \text{length} \times \text{width} \times \text{height}$$

Unit is cubic inch

Calculating the volume of solid with irregular shape.

Take a bottle and make the marks for measuring volume on it.

Fill the half of bottle with water. Mark the level of water.

If a stone tied with a string of thread is put into the bottle slowly, the water level will elevate.

Mark the elevated water level.

The difference between the two measurements of water level is the volume of stone.

Lesson Planner

Suggested 9 period	Period 1	Period 2 and 3	Period 6 and 7	Period 4 5 8 9
Lesson Topic	Measuring volume of liquid	Measuring volume of solid	Same volume and different weight	Assessment/ Review
Sample lesson	4-1	4-2	4-3	
Specific objective	To be able to explain that liquid takes some space in the empty glass. To be able to explain that volume of liquid can be measured by measuring cylinder	To be able to explain how to measure the volume of regular and irregular shape of solid	To be able to describe that the weights of the different solids, which are the same in size, are different. To be able to explain that the volumes of the different solids, which are different in weight, can be the same.	
Introduction (Motivation/ Create interest/ Active prior knowledge)	<u>Activity 1</u> Let them guess if we pour water (liquid) into the empty glass, what will happen to the water (liquid)? <u>Activity 2</u> Let them guess if we pour water (liquid) into several cups, bottles, bowls etc, what will happen to the water (liquid)?	Ask them whether they would like to listen to a story or not? If they want to listen to a story, listen carefully and after that they have to answer some questions from teacher.	Let the children look at the two same sized of iron and wooden blocks and find out or guess what are they? Which is heavier?	
Core/ Development (Active engagement with test/task)	Activity 1,2	<u>Activity 3</u> <u>Activity 4</u> <u>Activity 5</u>	<u>Activity 3</u> <u>Activity 6</u> <u>Activity 7</u>	
Assessment points	Do they participate in the learning process such as guessing and doing experiments on pouring water into the empty glass and into several cups, bottles, bowls etc? Do they understand liquid takes some space called volume?	Do they participate in the learning process such as measuring solids and calculating the volume? Do they listen to the story carefully? Do they understand how to measure the volume of regular and irregular shaped solids?	Do they participate in the learning process such as measuring the solid and calculating its volume? Reading the volume of solids (regular and irregular shaped) by looking at the rising water level Thinking why the rising water levels are same? Do they understand how to measure weight, volume of regular and irregular shape?	

Activity 1 Volume of Liquid 1

Teaching/learning material

Glass (unit should be at least smaller than 10 cc each) or Measuring cylinder, water, cooking oil

Concept Liquid takes some space in the glass

Pour water into an empty glass. Let children see water takes up some space in the glass.

Pour cooking oil into empty glass. Let children see cooking oil takes up some space in the glass.

Let children find out, liquid takes some space called 'volume'.

Activity 2 Volume of Liquid 2

Teaching/learning material

Measuring cup or baby bottle (unit should be at least smaller than 10 cc each) or measuring cylinder, several cups, bottles, bowls, etc

Concept

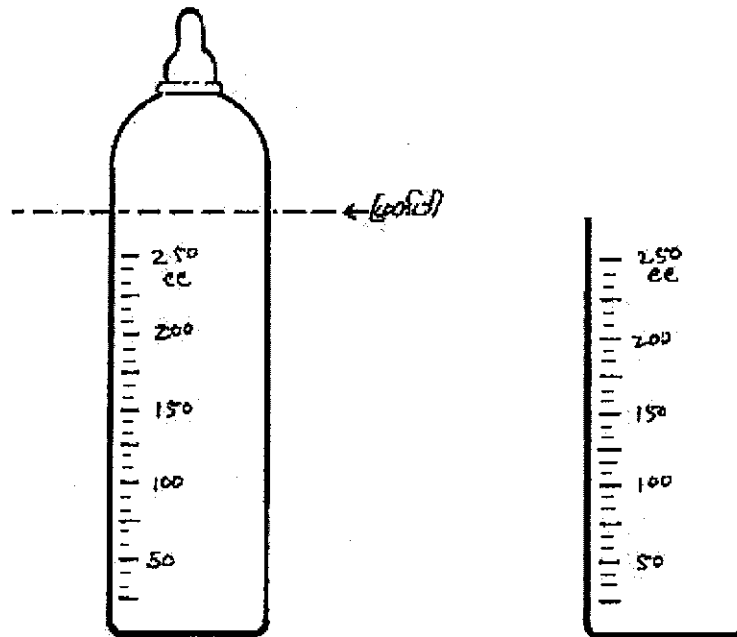
Volume of liquid can be measured by measuring cup or baby bottle (unit should be at least smaller than 10 cc each) or measuring cylinder

Teacher pours water into several cups, bottles, bowls, etc.

Teacher distributes these and measuring cups or baby bottles (unit should be at least smaller than 10 cc each) or measuring cylinders.

Ask children to measure volume of water in several cups.

Children write down the result as follows.



Activity 3 Calculate the volume of cubes

Teaching/learning material

Metal cubes (one for each group), wooden cube (one for each group), rulers (at least one for each group)

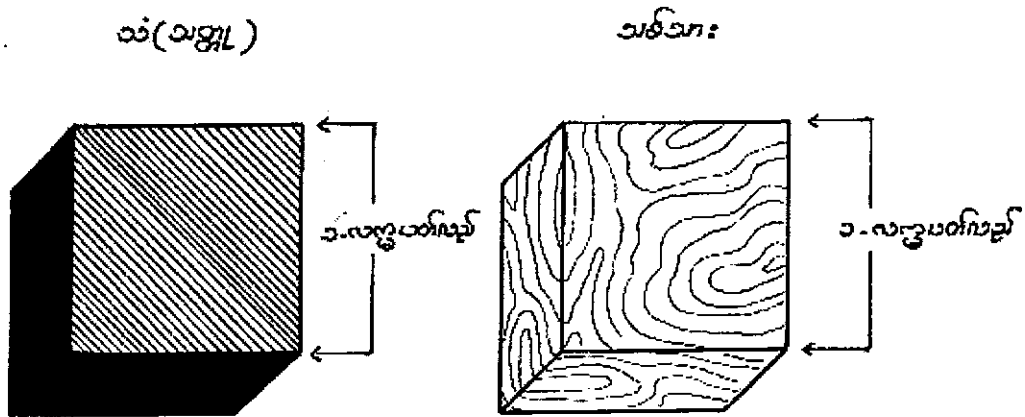
Concept The volume of cubes can be calculated

Teacher tells children to measure the height, length and width of the metal cube and the wooden cube.

Fill the following table.

	H	L	W	Volume
Wooden				
Metal				

Calculate the volume of cubes.



Activity 4 Story telling (Archimedes and gold crown)

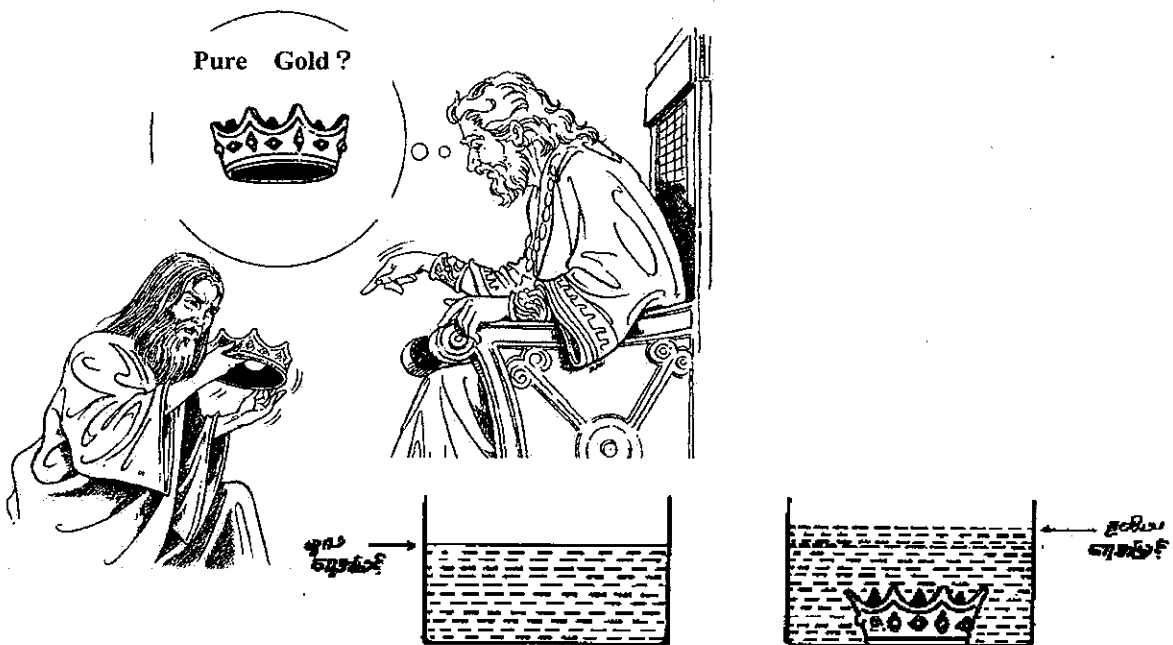
Teaching/learning material

Concept Measuring irregular shape of solid

Archimedes was a very famous scientist in Greek times. Archimedes was in his bath when he had his insight into how to measure the volume of irregularly shaped objects.

One day, he was asked by the king to come up with a way of finding out whether he was being cheated by the royal jeweler. The king had asked the royal jeweler to make a gold crown by giving him certain amount of gold. The jeweler made the crown and gave it to the king, but he felt that the crown was 'too light for its size' and it could be done so by adding base metal to his gold crown. He could not prove any wrongdoing of jeweler.

Archimedes was in his bath. He saw water spilling out as he was getting into water in the bath tub. A thought struck him that he could find the volume of a crown by seeing how much water it displaces. Once the volume and weight of the crown can be measured, the density of the crown can be known. Then, he can compare the density of the crown and the density of gold. He can find that the jeweler is cheating the king if densities are different.

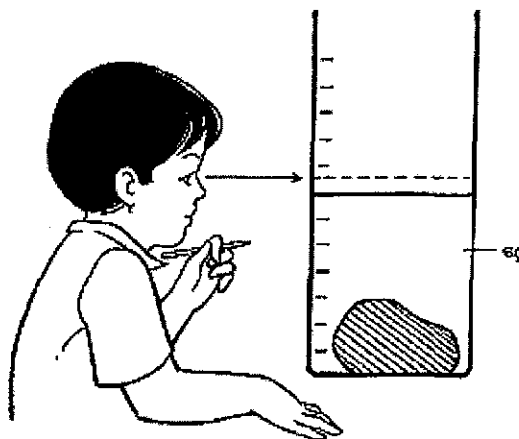


Activity 5 Measuring irregular shape of solids

Teaching/learning material

Stone or something irregular shape, Measuring Cup or Baby bottle (unit should be at least smaller than 10cc each) or Measuring cylinder

Concept Volume of irregular shape of solid can be measured by Archimedes theory



Teacher shows a stone or something irregular shaped and asks children, 'You listened the story of Archimedes and how do you think either possible to measure the volume of this shape?'

Children answer and discuss why they think it is possible.

Teacher distributes these and measuring cups or baby bottles (unit should be at least smaller than 10 cc each) or measuring cylinders 1/3 to 1/2 filled with water.

Teacher asks children to measure the volume of water (the water level) and to write down the result (Result A).

Teacher draws following picture on the white board and asks children if they think water raise higher or not, and teacher asks what will happen if we put a stone or something irregular shaped into water.

Teacher asks also
Why water is raised up?

Teacher distributes a stone or something irregular shaped to children and children put it into water.

Teacher asks children to measure the water level and to write down the result (Result B).
Teacher asks children what will be the volume of the stone or something irregular shaped.
After children answer, teacher explain that

$$\text{Result B} - \text{Result A} = \text{Volume of Stone} \\ (\text{Archimedes Theory})$$

Activity 6 Measuring Weight by Hand

Teaching/learning material

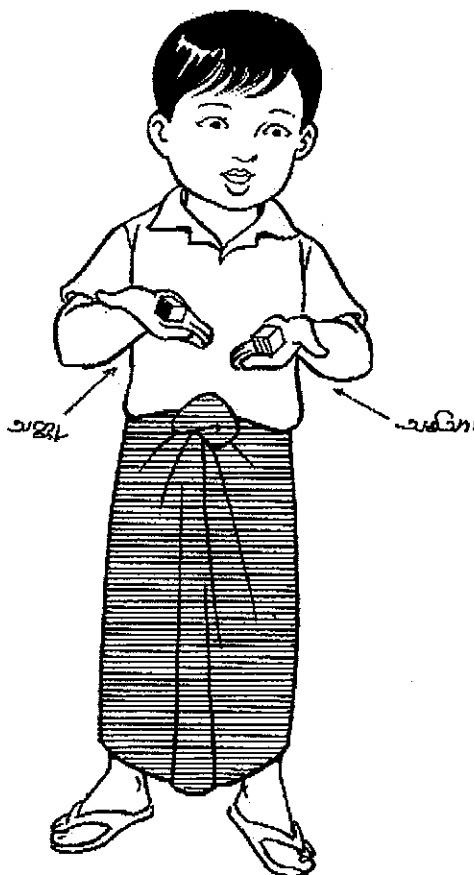
Metal cubes (one for each group), wooden cube (one for each group)

Concept Children feel difference of weight of metal cube and wooden cube

Teacher distributes metal and wooden cubes.

Teacher tells children to put the metal cube on one hand and wooden cube on the other hand, and judge which is heavier with the sense of the hands. At that time it is better children judge closing eyes.

Next exchange the cubes held with the right and left hands. Is the result same as one judged first time? All children must try the procedure.



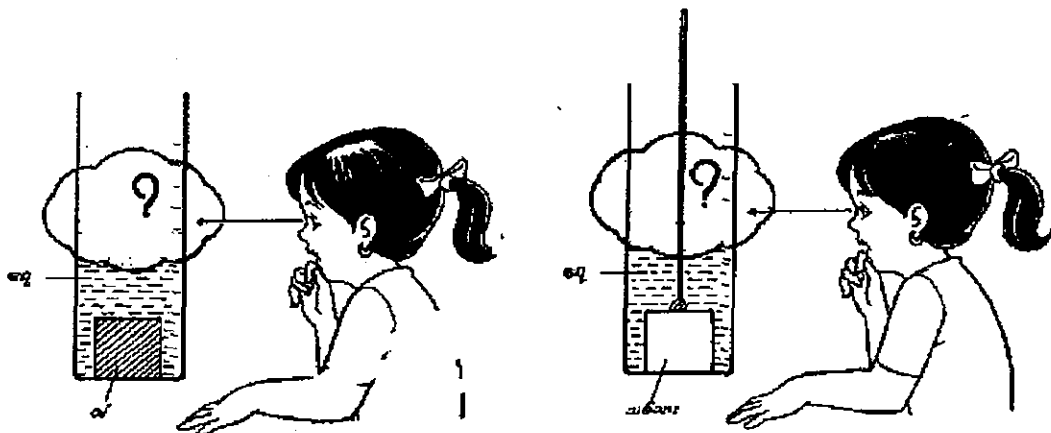
Activity 7 Volume and Weight

Teaching/learning material

Metal cubes (one for each group), wooden cube (one for each group), wire to push wooden cube down, measuring cup or baby bottle (unit should be at least smaller than 10 cc each) or measuring cylinder

Concept Archimedes theory is related to volume not weight

Teacher draws following picture on the white board and asks children if they put the metal cube and the wooden cube, which water level will be higher.



Teacher asks children to raise hands for the answer they predict.

1. The wooden cube replaces water higher
2. Almost the same
3. The metal cube replaces water higher.

Teacher writes down the number of children.
 Teacher asks the reason why they think so, individually.
 After that teacher asks again about children's prediction.
 Teacher writes down the number of children.

Teacher asks children to carry the experiment. Find the result.
 After experiment, teacher asks the result.

Teacher can conclude 'if the volume is same whatever weight, it replaces the same amount of water'

Lesson Plan 4-1

Lesson topic: Measuring volume of liquid
 Learning objectives: Be able to describe that liquid can take space and its volume can be measured.
 Teaching/learning materials: Water, oil, glasses, bottles, measuring cylinder
 Teaching period: 35 minutes

Teaching/Learning procedure

Learning Activities	T	Teaching/ Learning Materials	Points to be Noticed
<p>Introduction (refer to Activity 1) Since the three states of matter have been taught in grade three, ask again the 3 states. Ask the children to think and describe what is liquid together with examples.</p> <p>Development</p> <p>Activity (1) Teacher distributes children materials according to group. Pour water into an empty glass. Then put oil into another empty glass. Ask, in which place does the water and oil exist? According to the children's answer let them review that water and oil take space in the glass. After they have known that water and oil are taken space in the glass, let them experiment and study that the amount of water and oil in the glass is the volume of water and oil.</p> <p>Activity (2) Different sized cups and bottles will be distributed to children according to groups. Let them put water into those cups and bottles and let them review that water can take space in different cups and different bottles. Then let the children think how the amount of water taken space in the cups and bottles can be measured. Let the children tell their opinions. If the children do not know clearly teacher will explain that the amount of water can be measured by using a measuring cylinder for volume. In measuring, tell the children that it is to measure by putting the surface of water on a level with the marks on the cylinder and let them measure practically. Ask the children to tell the water volume measured according to group.</p> <p>Conclusion. It will review that liquid can take space in empty cups and the amount of liquid taken space is called the volume of liquid and that the volume of liquids can also be measured.</p>	<p>5</p> <p>10</p> <p>15</p> <p>5</p>	<p>Blackboard</p> <p>Water, oil, two glasses</p> <p>Different sized cups and bottles, measuring cylinder</p>	<p>Have each child tell and the teacher has to accept the various answers.</p> <p>Record the children's answer on the blackboard.</p> <p>If there is no measuring cylinder for volume measuring cup for volume (or) feeding bottle can be changed and used as appropriate.</p> <p>Record the presented facts according to group on the blackboard.</p>

Lesson Plan 4-2

Lesson topic: Measuring volume of solid.
 Learning objectives: Be able to explain on how the volumes of irregular shaped solids are measured.
 Teaching/learning materials: Transparent glass on which volume marks are written (or) measuring cylinder for volume, stone, zinc wire.
 Teaching period: 70 minutes
 Teaching/Learning procedure

Learning Activities	Time	Teaching/ Learning Materials	Points to be Noticed
<p align="center">Introduction</p> <p>Prior knowledge about 'Solid' from their study in Grade 3 about 3 states of material Ask the children to think and describe what is solid together with examples.</p>	5		Teacher lets the children discuss among one another and records the answer.
<p align="center">Development</p> <p>It will begin with question. - How many kinds of solids are there? - How can regular-shaped solids be measured?</p> <p>1. Let us measure the volume of an irregular shaped solid. - Teacher will tell the experimental procedure. - Take the transparent glass on which the volume marks are registered. - Put some water into that glass and note down the level of water. - Tie the stone with a zinc wire - When the stone is put into the glass note down the water level that rises. - Tell children that the difference between the two water levels is the volume of the stone.</p>	15	Transparent glass on which the volume marks are registered (or) measuring cylinder for volume , stone, zinc wire, water,	In reading the water level the eye must be on a straight line with the surface of water. Give notice not to see obliquely from above or below.
<p>2. Have the children carry out experiment. - Teacher will distribute the materials for experiment to children. - Teacher will urge children to carry out according to group. - Teacher will tell children to note down the marks of water levels carefully. - Teacher will ask children to carry out the experiment systematically. - After the experiment let the children put away the things systematically. - The question, 'how much is the volume of stone', will be asked. - Children's answer will be recorded on the blackboard.</p>	25		Teacher will urge children to carry out carefully according to group. Let the children note down the marks of water level inside the notebook carefully. Have them calculate the volume of stone. The findings from experiment have to answer by each representative of the group.
<p>3. Story telling about "Archimedes and gold crown" (Activity 4) and teacher leads discussion how Archimedes found the gold crown was pure or not.</p>	20		
<p align="center">Conclusion.</p> <p>The volume of an irregular shaped solid can be measured with a measuring cylinder for volume (or) with a transparent glass on which the volume marks are registered.</p>	5		

Lesson Plan 4-3

Lesson topic: Same volume and different weight.
 Learning objectives: To be able to describe that the weights of the different solids, which are the same in size, are different.
 To be able to explain that the volumes of the different solids, which are different in weight, can be the same
 Teaching/learning materials: Iron blocks and wooden blocks which have similar measurements of length, width, and height, transparent glass with mark for measuring volume on it, string of zinc with a loop at its end, water bowl, water cup.
 Teaching period: 70 minutes (2 periods)
 Teaching/Learning procedure

Learning Activity	Time	Teaching/ Learning materials	Points to be noticed															
<p>Introduction Teacher reminds previous lessons about how to measure volume of liquid and solid</p> <p>Core/Development Have the children look at the two similar sized-blocks of iron and wood, and ask, "What kind of materials are those blocks?" If they answer "This is iron/wood", - Find out these are solids. - Tell the children that experiments on solids will be carried out and write the topic on the blackboard.</p> <p>1. Which is much heavier between iron block and wooden block? Have the children guess by putting the blocks on their right and left palm. Have them guess again after shifting the blocks vice versa. Have them draw a chart and fill the answer in it.</p> <p>2. Distribute each iron block and each wooden block to each group. - Have the children measure the length, width and height of the iron block and wooden block in inch. - Have them calculate the volumes of the two blocks. - Let them tell the noticeable point in the result of calculation. (It was found that the volumes are the same)</p>	<p>5</p> <p>5</p>	<p>One iron block and wooden block with similar size.</p> <p>Teacher draws a sample of chart on the blackboard</p>	<p>To let the children touch the blocks to identify the kind if not possible to do so through looking at those.</p> <p>To draw a weight chart</p>															
<p>1. Weights of iron block and wooden block (Light/heavy)</p> <table border="1"> <tr> <td>Wooden block</td> <td></td> </tr> <tr> <td>Iron block</td> <td></td> </tr> </table>				Wooden block		Iron block												
Wooden block																		
Iron block																		
		<p>Iron blocks and wooden blocks in similar measurement</p>	<p>Have the children draw a chart to fill calculation of volume, length, width, and height.</p>															
<p>2.measuring the volume of two blocks</p> <table border="1"> <thead> <tr> <th></th> <th>Length</th> <th>Width</th> <th>Height</th> <th>Volume(cm³)</th> </tr> </thead> <tbody> <tr> <td>Wooden block</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Iron block</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>					Length	Width	Height	Volume(cm ³)	Wooden block					Iron block				
	Length	Width	Height	Volume(cm ³)														
Wooden block																		
Iron block																		

Learning Activity	Time	Teaching/ Learning materials	Points to be noticed				
3. Distribute the transparent glasses with marks for measuring volume. - Have the children read the water level on the cup and note down.	5	Transparent glasses with marks for measuring volume 1. <u>Water volume</u> (.....) CC	Have the children note down on paper or book. - To keep the glass and water in its original position				
4. Have the children guess the water level. - Ask, "What will happen to the water level if the blocks of iron and wood are put into the transparent glass alternately?" - Give them three answers and have them raise their hands for the answer they choose and count the numbers. (1) The water level when iron block is put into the glass is much higher. (2) The water levels are the same. (3) The water level when wooden block is put into the glass is much higher.	15		- To draw the following picture - To put the wooden block first.				
- Tell the procedure of experiment for the children's guesses. - At first, put the wooden block into the glass in which water has already been poured and its volume has been noted in the beginning of the lesson. - Press the wooden block in order to make the block immerse into the water by using a string of zinc with a loop at its end. - Read the water level and note it down in the chart. - Take out the wooden block and put the iron block into the water in glass slowly. - Read and note down the water level in the chart while iron block is dipped in the water. - It was found that rising water levels are the same according to the chart. Then ask, why?	20	Transparent glass with mark for measuring volume. Wooden blocks and iron blocks for every group, a string of zinc with a loop at its end	Have the children do the experiment only after the teacher's demonstration. The water level has to be noted down in the chart.				
<p style="text-align: center;">Conclusion</p> Even when different materials (solids) have the same volume, their weights can be different. The levels of water will be equally raised when two solids have the same volume. The degree of level rising is subject to the volume but not to the weight.		4. Rising water level <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 2px;">Wooden block</td> <td style="width: 50%;"></td> </tr> <tr> <td style="padding: 2px;">Iron block</td> <td></td> </tr> </table>	Wooden block		Iron block		- The answer of each child has to be noted down on the blackboard.
Wooden block							
Iron block							

Assessment

Point of Assessment

Interest/Attitude/ Motivation	Scientific thinking	Technique	Knowledge and understanding
Is s/he interested in the study of measuring the volume and weight of matter?	Is s/he able to relate the volume and the liquid takes place, the volume and the rising water level?	Is s/he able to carry out activity?	Is s/he able to understand that how the volume and the weight of matter can be measured?
Is s/he motivated to learn in relation with the volume and the weight of matter can be measured?	Is s/he able to relate and think the volume and the liquid takes place, the volume and the rising water level?		Is s/he able to understand the relationship of the volume and the liquid takes place, the volume and the rising water level?
Does s/he like to study about measuring volume and weight of matter?			

This lesson contains many observation

Achievement can be assessed by the skills of children in observation

- test the attitude of children
- test the ability of children
- test the understanding of children
- observing children pour water into the empty glass and realize that water takes some places in the glass called volume.
- observing children learn how to read the measuring cylinder.
- observing children whether they can feel difference of weight of different things by using their hands.
- observing children how they calculate the volume of the cubes.
- observing children learning if the volume is same whatever weight, it replaces the same amount of water.
- observing whether children getting idea on measuring irregular shape of solid.

Oral Assessment

- Encourage them to read the measuring cylinder and tell the volume of matter.
- Encourage them to weigh the different things by hands and tell how they feel the differences.
- How can we measure the irregular shaped solid?

Written Assessment

- Explain how we can know the two different things but same size has the same volume.
- Explain how we can measure the volume of the liquid.
- Explain how we can measure the volume of regular shaped solid/irregular shaped solid.

Message to teacher

Teacher observes while children are doing the activities.

Teacher encourages children to express their findings.