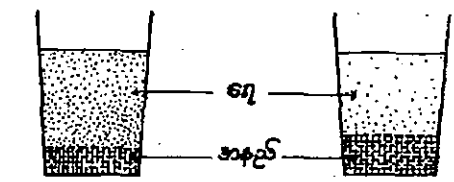


Topic 12: Water and Soil

<u>1. Key concept</u>	Water and soil influence our environment
<u>2. Learning objective</u>	
General Objectives	<ol style="list-style-type: none"> 1) To be able to acquire that soil from different places has different characteristics. 2) To be able to describe character of water surrounding.
Specific Objectives	<ol style="list-style-type: none"> 1) To be able to identify that soil from different places has different features in the field 2) To be able to tell their finding from observation 3) To be able to conduct experiment with soil collected in the field 4) To be able to tell their finding in observation in the field and in classroom 5) To be able to tell their prediction what will happen after experiment 6) To be able to tell their finding after experiment 7) To be able to describe that all the water sources are related to each other 8) Be able to acquire that water can evaporate into the air as well as can diffuse into the ground. 9) Be able to describe that water can evaporate into the air as well as can diffuse into the ground
<u>3. Activities involved</u>	Field Trip Observation Experiment Discussion
<u>4. Activity purpose</u>	To let children find soil from different places where they are familiar has different character.

Before Getting Started

Self-check list for Teachers	<input type="checkbox"/> Am I clear to distinguish different types of soil? <input type="checkbox"/> Am I clear about what all kind of source of water and circulation of water?
Background information for teachers	
Muddy colored water	If muddy water (yellow, red or brown color) is noticed in a stream or in a river, this indicates that soil is being carried along with the
	 <p style="text-align: center;">ရှမ်းနစ်အကြာ ရွှံ့ရှိတဲ့အနည်ထိုင်ခဲ</p> <p style="text-align: center;">၁ နာရီအကြာ အနည်ထိုင်ခဲ</p>

water. Show this by taking a sample of the water in a glass from different places in the stream and leave it to stand. It can then roughly be seen how much sediment has been transported. Especially the finer particles in the sediment have absorbed nutrients and the water should be left to stand for a while before these particles settle.

Lesson Planner (Water)

Suggested period (8)	Period 1	Period 2	Period 4	Period 5	Period 6
Topic lesson	Water Sources1	Water sources2	Water Evaporation 1	Water Evaporation2	Water Diffusion
Sample lesson plan	12-1		12-2		
Specific Objectives	To be able to describe that all the water sources are related to each other		Be able to acquire that water can evaporate into the air as well as can diffuse into the ground.		Be able to describe that water can evaporate into the air as well as can diffuse into the ground.
Introduction (Motivation/Create interest/Active prior knowledge)	Recall the prior knowledge from KG and G1. Q&A What are the different water sources? What are the different water sources and their distinction?		Recall the prior knowledge form the previous lesson. Then link it with the practical work. It is necessary to work on "Where water goes instead of running from one place to another?"		Recall the prior knowledge form the previous lesson.
Core/ Development	Watching the picture and listening to the story as well. Q&A.	Express their ideas or thoughts through filling the table. Q&A	Prediction: What will happen to the water? Which will be left inside the cups if you leave it for two days? Prediction: What will happen to the wet and dry sand inside the cups in case of leaving them for two days? Doing experiment	Prediction: What will happen to the water if you wipe out with a towel or a sponge? Doing experiment Prediction: What will happen to the water if you pour onto the ground? Doing experiment	Observing the four cups, which filled with water, dry and wet sand. Discussion on where the lost water inside the cups goes. Finding out the results form observation and discussion
Evaluation	Do they participate in learning processes such as watching the pictures carefully, listening to the story carefully, asking questions and responding the questions?	Do they participate in learning processes such as expressing their ideas, filling the tables, asking questions and responding questions? Do they understand there are different water sources and they are related to each other?	Do they participate in learning processes such as predicting and doing experiments? Can they handle the experiment?	Do they participate in learning processes such as predicting and doing experiments? Do they understand water can sink or diffuse into the ground?	Do they participate in learning processes such as observing the cups carefully, discussing, finding out the result? Do they understand water can go into the air by evaporation as well as into the ground by diffusing?
Adaptation of curriculum	Any other activities or experiments in which evaporating into the air and sinking or diffusing into the ground of the water can be obviously seen can be replaced in the lesson plans.				

Lesson Planner (Different soils)

Suggested periods (17)	Period 9 10 11	Period 12 13 14
Lesson title	Different Soil 1	Different Soil 2
Sample lesson plan)		12-3
Specific objective	<p>To be able to identify that soil from different places has different features in the field</p> <p>To be able to tell their finding from observation</p>	<p>To be able to conduct experiment with soil collected in the field</p> <p>To be able to tell their finding in observation in the field and in classroom</p> <p>To be able to tell their prediction what will happen after experiment</p>
Introduction (Motivation/Create interest/Active prior knowledge)	Giving important points to be noticed for this trip.	Recall the prior knowledge from the trip then link it with the experiment “ what will happen to the soil mixture after 2 days?”
Core/Development (Active engagement with test/task)	Observe and collect soil from different places. Fill up the opinions in the given table.	Doing experiment. Predict what will happen to the soil mixture inside the cups after two days, and then give the reason why?
Assessment points	<p>Do they participate in the learning process such as observing and collecting soil, sharing their ideas, filling up their thoughts in the table?</p> <p>Do they get the idea that different soil from different places has different features?</p>	<p>Do they participate in the learning process such as doing the experiment, predicting what will happen to the soil mixture after two days, giving reason why?</p> <p>Do they understand how to handle the materials while doing the experiments?</p>
Adaptation of curriculum	The activity of whole day trip or half-day trip can be arranged by local teachers. In case of difficulty for teachers to manage, it is possible that teachers can collect the different soil ahead before teaching the lesson plans, 8 and 9.	

Lesson Planner (Different soils)

Suggested periods	Period 15	Period 3 Water Sources Period 7 8 Water Evaporation Period 16 17 Different Soil
Lesson title	Different Soil 3	
Sample lesson plan	12-4	
Specific objective	To be able to tell their finding after experiment	
Introduction (Motivation/Create interest/Active prior knowledge)	Ask them to observe, “what has happened to the soil mixture?”	Assessment/Review
Core/Development (Active engagement with test/task)	Observing the experimented cups. Presenting their findings. Differentiate the type of soil. Fill up the table according to their findings.	
Assessment points	Do they participate in the learning process such as observing the experimented cups, presenting their findings, differentiating the type of soil, filling up the findings in the table. Do they understand different soil from different places has different characteristics?	
Adaptation of curriculum	The activity of whole day trip or half-day trip can be arranged by local teachers. In case of difficulty for teachers to manage, it is possible that teachers can collect the different soil ahead before teaching the lesson plans, 8 and 9.	

Activity 1 Flowing Water (story telling)**Teaching/learning material**

Chart, Story

Concept Water flows connected to our life

Almost three-quarters of the Earth's surface are covered with water, making the planet look blue from Space. Water is essential to life on Earth. Without it, all animals and plants would die. Oceans and seas make up most of the world's water. But there is also water in the sky, in the form of clouds. Rain or snow falls from the clouds and collects in lakes, rivers and glaciers (rivers of ice). Water and ice have the power to change the shape of the land. About 97% of the world's water is salty and is found in our oceans and seas. The other 3% is fresh water, from ice (in glaciers and ice sheets), rivers and lakes, or clouds.

The biggest and deepest ocean in the world is the Pacific Ocean and the longest river in the world is the Nile.

The source or beginning of most rivers is rain water which collects in small hollows or gullies and trickles over the surface of the land. This water does not soak into the soil or the rocks below because the rocks are either already full of water or will not let water pass through them. The trickles of water join up into a stream and several streams flow together to make a river. Other rivers start as mountain springs or flow from lakes, marshes or glaciers. For example, Irrawaddy Rier is from the glaciers in high mountain Hkakabo Razi and part of Salween River is from Inle Lake.

Where the land is less steep, the river begins to flow more slowly, cutting sideways into the land rather than downwards. The river

now contains more water because other rivers and streams - called tributaries - have joined it, and it carries a greater load. The slower moving water does not have enough power to carry all its load away, so some of the material drops to the river bed and settles there.

When a river flows slowly, the water takes the easy route around small humps or hill rocks rather than rushing over them. This makes the river swing or meander from side to side.

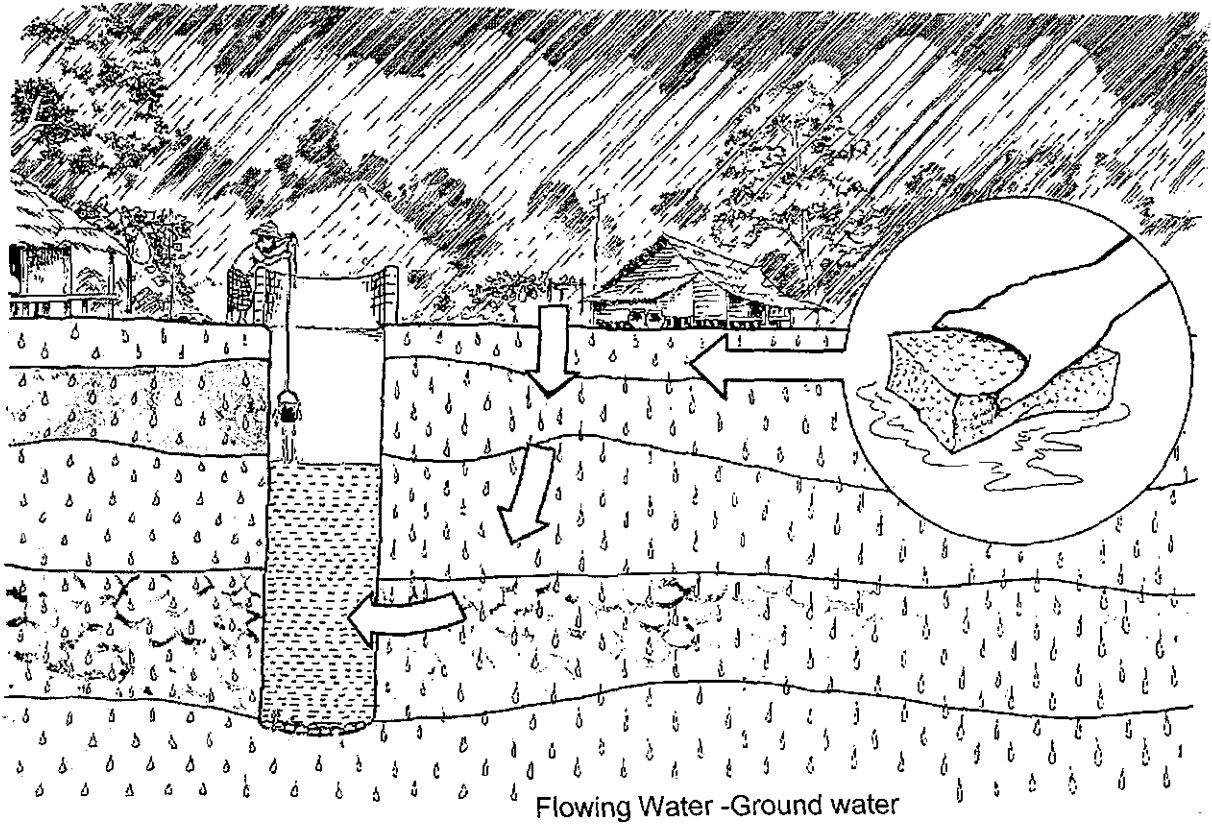
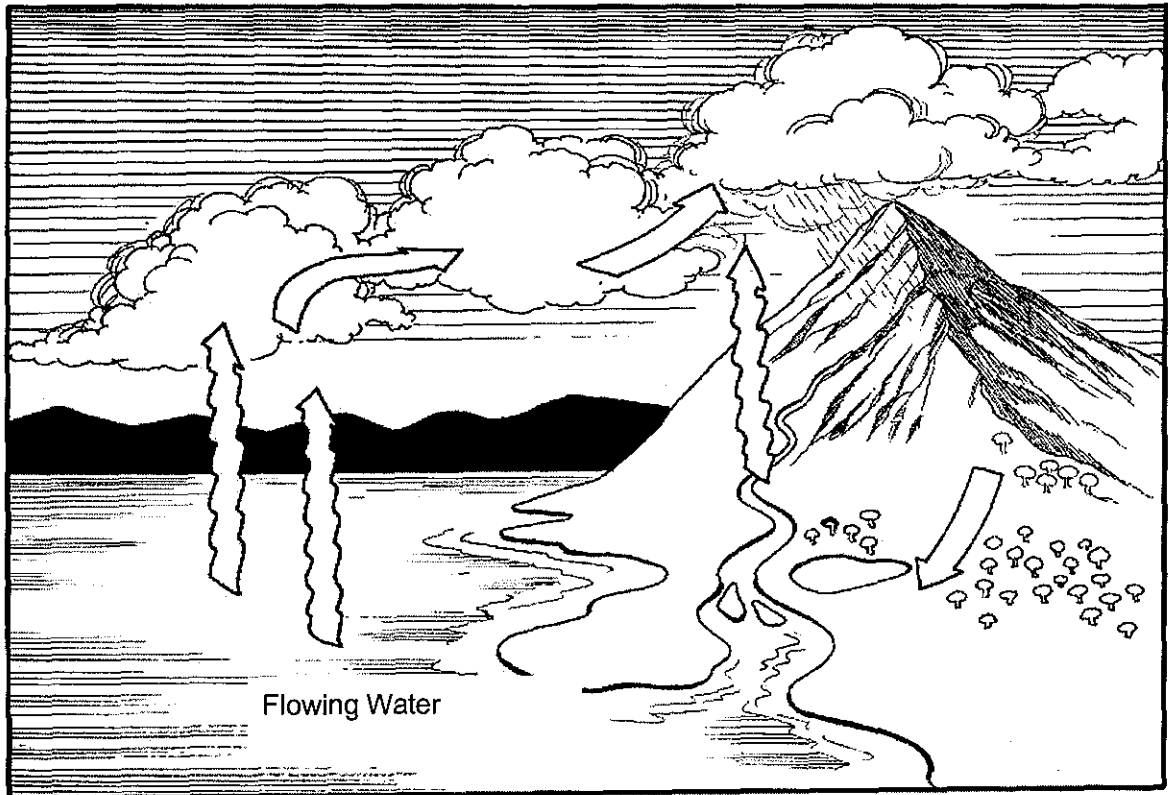
The point where a river meets the sea is called the river's mouth. Here, the river slows down even further, dropping more and more of its load. Deltas often form at river mouths when the material dropped by the river builds up a fan-shaped area of flat, marshy land.

The river splits into smaller channels, flowing around islands of new land to the sea. Deltas got their name because most of them are triangular in shape, like the Greek letter 'delta'. The new land made around a delta is almost flat. So when there is a lot of rain, rivers on deltas often break out of their channels and flood the land.



Delta Area of Myanmar formed by River, Check where it is in your map

Rainwater may go under the ground, above impermeable rock layers through which it cannot pass. Where the rock layers reach the surface, the water comes out as a mountain spring.



Activity 2 Water in Nature

Teaching/learning material

Concept Where is water from in nature

Teacher draw the table below and asks children
 'Where is this water from ?

Type of water	Where is water from	Where is water going?
Puddle		
Well		
Pond		
River		
Lake		
Sea		
Flood water		

Children can answer and teacher can fill the second column of table.

It is important for children

1. to be aware water has sources
2. to know natural water can be linked to rain and other sources of water (if they can not find, it is too necessary to tell them. Following activities will let them find out).

Teacher asks again

'Where is water going?'

Children can answer and teacher can fill the third column of table.

It is important for children

3. to be aware how water related to their life
4. to know water evaporate from everywhere (if they can not find, it is not necessary to tell them. Following activities will let them find out).

Activity 3 Puddle water

Teaching/learning material

Concept Where are puddle water comes from and where is it going

Teacher asks children,
'After the rain, what can you observe on the ground?'

Children can answer 'Puddle' or 'wet ground' or something like this.

Teacher can ask children,
'After rain stops, where is this water going?'

'Puddle on the soil?'

1. into the ground
2. evaporate to air
3. go to river/ canal /sewage
4. other (then where?)

'Puddle on the concrete place?'

5. into the ground
6. evaporate to air
7. go to river/canal /sewage
8. other (then where?)

'Puddle on the street?'

9. into the ground
10. evaporate to air
11. go to river/canal /sewage
12. other (then where?)

'Puddle on the sand?'

13. into the ground
14. evaporate to air
15. go to river/canal/ sewage
16. other (then where?)

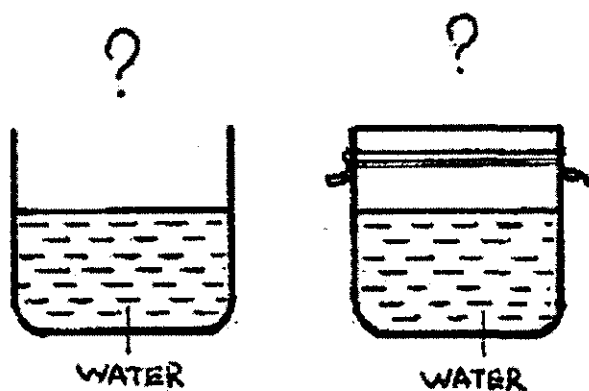
It is easier for children to guess, water 'goes into ground' and flows to somewhere, because it is visible. If possible, aware children also to mention the idea, 'water might go to air (evaporation). Somehow, following activities will show this fact, therefore it should not be TAUGHT!

Activity 4 Where water goes? - 1

Teaching/learning material

Two identical cups, plastic

Concept Natural water evaporates



Teachers tell children,
 'even puddle water does not go into ground or anywhere, for example puddle water on the plastic sheet, after some time, water disappears.
 Where water goes?'

Children can discuss.
 Teacher gives material as follows.

Children can prepare for observation. Let it stay for 1-2days.

After 1-2days
 Teacher asks
 'What do you observe?'
 'Where is water drips on the plastic cover from?'
 Children can choose from following answer.

1. from plastic cover
2. from water below
3. somebody put water on plastic
4. other

'Why do you see water is less than 1-2days ago?'

1. plastic cup absorbed water
2. somebody drank water
3. water goes to air.
4. other

Teacher tells that drips come from water, it goes to air and stopped by plastic cover.

Activity 5 where water goes? 2

Teaching/learning material

Two identical cups, plastic sheet, wet sand, dry sand

Concept Natural water evaporates

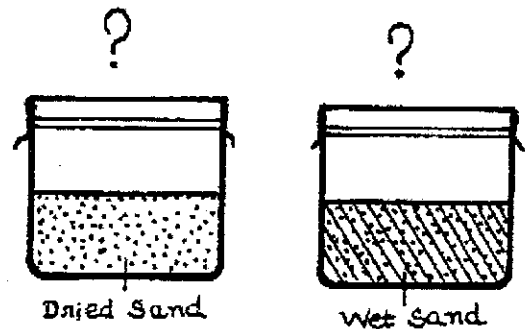
This is an application activity, you can use wet sand(after rain) and dry sand (no rain) instead of water.

Teacher tell children,
 'even puddle water does not go into ground or anywhere, for example puddle water on the plastic sheet, after some time, water disappear.

Where water goes?'

Children can discuss.

Teacher gives material as follows (use this time



Children can prepare for observation. Let it stay for 1-2days.

After 1-2days

Teacher asks

'What do you observe?'

'Where is water drip on the plastic cover from?'

Children can choose from following answer.

5. from plastic cover
6. from water below
7. somebody put water on plastic
8. other

'Why do you see water is less than 1-2days ago?'

5. plastic cup absorbed water
6. somebody drank water
7. water goes to air.
8. other

Teacher tells that drips come from water, water goes to air and stopped by plastic cover.

Activity 6 Water in the ground goes to air?

Teaching/learning material

Plastic pack

Concept Water absorbed into ground also goes to air.

Teacher tell children

'use this type of plastic and cover the ground. Wait some times. What will happen?'

Children can chose

1. Plastic pack will get wet
2. ground will get wet
3. nothing will happen.
4. other

Children raise hands what they think answer.

Children can tell the reason why they think so.

After that, teachers take children outside. Children can find some place to cover ground with plastic pack.

After sometimes, observe plastic pack, if possible with magnifying lenses.

Teacher asks children

'Where is water drip from'

1. from plastic
2. from ground
3. from sunshine
4. other

Teacher explains

'Water absorbed into ground can also go to air.'

'Water goes to air, this is not visible, called evaporation'.

Teacher can tell other type of evaporation. As drying clothes etc.

Activity 7 Soil and sand; excursion

Teaching/learning material

Plastic bags, soil, sand

Concept

Different types of soil is found different places

Teacher tells children

'We are going out for collecting soil and sand'

Teacher asks children

'where can we find clay soil?'

(agricultural field, around pond, around lake etc)

Teacher asks children

'Where can we find sand?'

(riverside, beach etc)

If possible, teacher takes children to collect soil and sand from different places.

Children have to record where they get soil or sand

Teacher can ask children to collect around their home.

Plastic bag No.	Where to get
1	
2	
3	

NOTE: It is very difficult to get 'pure clay soil' or 'pure sand soil'. Therefore teacher should focus on 'more sandy soil' or 'more muddy soil'.

Activity 8 Different types of Soil

Teaching/learning material

Different types soil, Magnifying lenses

Concept

Different types soil has different characteristics

Teacher asks children to check the characteristics of soils and fill the table below.
 Teacher let children to observe soil with magnifying lenses.

Bag No.	Color	Texture	Grain size	Grain shape	Smell	Presence or absence of plants/animal
1						
2						
3						
4						
5						
6						

Activity 9 Separating components of soil

Teaching/learning material

Different types soil, Glasses or transparent cup/bottle, Water

Concept Soil component can be separated into layer in water

Teacher tells children to fill the glasses (or plastic cups/bottles) with water and place handful of one type of soil to one glass (cup/bottle).

Then teacher asks children

‘What will happen, if you shake glasses (or plastic cups/bottles) with mixture of water and soil?’

For Sandy soil?

For Muddy soil?

Then Teacher asks children to shake the glasses (or plastic cups/bottles) and observe what happens.

After that Teacher asks children

‘What happened, what did you observe?’

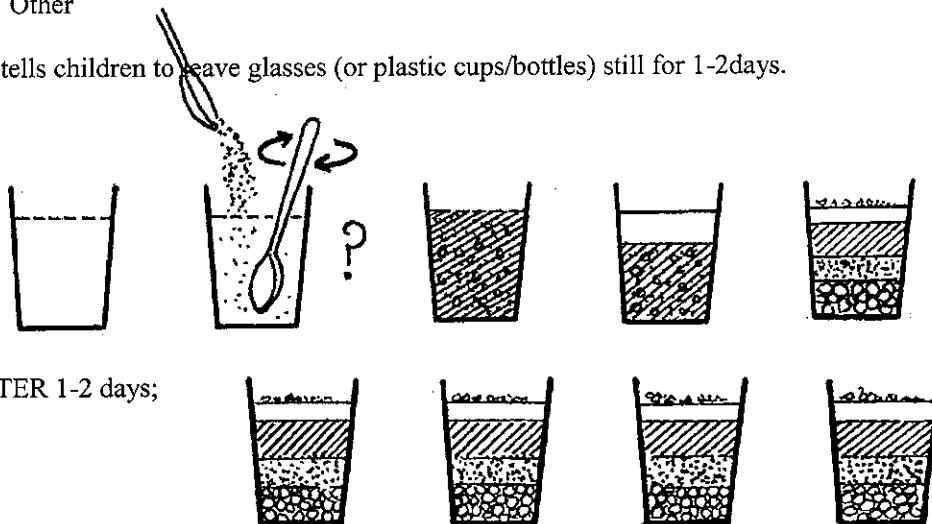
After children answer, teacher asks again,

‘If you keep these glasses (or plastic cups/bottles) for 1-2 days still, what will happen?’

Children can answer from following answer (teacher writes down on blackboard).

1. Soil will separate and sink as mixture
2. Soil will make layer on the bottom
3. Nothing will change, water will be still muddy water.
4. Other

Teacher tells children to leave glasses (or plastic cups/bottles) still for 1-2days.



Teacher asks children to observe the glasses (or plastic cups/bottles).

(Teacher writes down answer 1-4 on blackboard).

Teacher asks children ‘What happened, what did you observe?’

Lesson Plan 12-1

Lesson topic: Water sources
 Learning objectives: To be able to describe all the water sources are related to each other
 Teaching/learning materials: The story and picture attached
 Teaching period: 70 minutes (2 periods)
 Teaching/Learning procedure

Learning Activity		Time	Teaching /Learning Materials	Points to be noticed																																			
<p align="center">Introduction</p> <p>Remind the children what they have learned in KG about water. Ask them, 'What are the different water sources?' Remind them what they have learned in Grade I about water. Ask them, 'What are different water sources and their distinctions?'</p> <p align="center">Core/development</p> <p>1. The teacher will tell the students that we have already known what are different water sources. Let's observe how they are relating to each other or where water comes from or where it goes to etc. ... The teacher shows them the picture attached and tells them about the story. Let them listen the story carefully and observe the picture carefully too.</p> <p>After listening to the story, ask the children what ideas they learn from the story and the picture. Ask the children to fill the following table.</p>		10	Story and picture attached	Record their responses on the blackboard.																																			
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>No.</th> <th>Water Sources</th> <th>Where it comes from</th> <th>By which way</th> <th>Where it goes to</th> <th>By which way</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Stream</td> <td>Rain</td> <td>Rain</td> <td>Lake</td> <td>Moving</td> </tr> <tr> <td>2.</td> <td>Stream</td> <td>Rain</td> <td>Rain</td> <td>Sky</td> <td>Evaporating</td> </tr> <tr> <td>3.</td> <td>Stream</td> <td>Rain</td> <td>Rain</td> <td>Ground</td> <td>Sinking</td> </tr> <tr> <td>4.</td> <td>Stream</td> <td>Rain</td> <td>Rain</td> <td>River</td> <td>Moving</td> </tr> <tr> <td>5.</td> <td>River</td> <td>Stream</td> <td>Moving</td> <td>Sea</td> <td>Moving</td> </tr> </tbody> </table>		No.		Water Sources	Where it comes from	By which way	Where it goes to	By which way	1.	Stream	Rain	Rain	Lake	Moving	2.	Stream	Rain	Rain	Sky	Evaporating	3.	Stream	Rain	Rain	Ground	Sinking	4.	Stream	Rain	Rain	River	Moving	5.	River	Stream	Moving	Sea	Moving	15
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<p>After filling the above table, ask them what ideas they learn from the table. (Water is moving from stream to lake, river, sea and finally to ocean etc. and it also evaporates to the air to become clouds then it rains. In addition, it sinks into the ground to become underground water.)</p> <p>Conclusion From the above learning it can be concluded that 'All water sources are related to each other by moving, evaporating and sinking.</p>				Record their responses on the blackboard																																			

Lesson Plan 12-2

Lesson topic: Evaporation and Diffusion of Water
 Learning objectives: Be able to describe that water can evaporate into the air and can diffuse into the ground
 Teaching/learning materials: Same-sized cups, plastic bags, wet sand, dried sand, water, towel, sponges, rubber bands.
 Teaching period: 3 periods
 Teaching/Learning procedure

Learning Activities	Time	Teaching/learning materials	Points to be noticed.															
<p style="text-align: center;">Introduction:</p> <p>In the previous it has already been described that different water sources relate one another by flowing, evaporation and diffusion. Though water flowing from one place to another is visible to the eyes, the fact that water evaporates (or) diffuses into the ground will not be visible to the naked eye. Therefore, it is necessary to study practically the fact that water evaporates into the air and the fact that water diffuses into the ground.</p> <p style="text-align: center;">Core / development:</p> <p>Teacher shows first the two same sized cups and fills the cups with equal volume of water. Keep one cup as it is and cover the remaining cup with a plastic bag. After about (2) days what will happen to the water inside those two cups. Let the children think and let them discuss. Then, ask them to choose from the following answers:</p> <ol style="list-style-type: none"> 1. will increase 2. will decrease 3. as it was before 4. water drops will hang on the plastic bag. <p>Ask them to give reasons why they have chosen.</p> <div style="border: 1px solid black; height: 50px; width: 100%; margin: 10px 0;"></div> <p>Do not tell either right or wrong to the children's answers. Distribute the practical materials. Let them fill the two same sized cups with equal volume of water. Ask one cup to cover with a plastic bag. Tell them to place in a row the stated cups at the corner of the room according to groups. Tell them that after leaving the cups for about two days it will be observed what will happen.</p> <p>Children's practical activities. Then tell them that it will continue to think about the next experiment.</p>	<p style="text-align: center;">5</p> <p style="text-align: center;">10</p> <p style="text-align: center;">5</p>	<p style="text-align: center;">Same sized cups, plastic bags, water, rubber band.</p>	<p style="text-align: center;">Take tally to record.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th style="writing-mode: vertical-rl; transform: rotate(180deg);">Increase</th> <th style="writing-mode: vertical-rl; transform: rotate(180deg);">Decrease</th> <th style="writing-mode: vertical-rl; transform: rotate(180deg);">as before</th> <th style="writing-mode: vertical-rl; transform: rotate(180deg);">on plastic bag</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">W/O</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">W</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>Water evaporates into the air. However, as it is covered with a plastic bag, the water vapor does not reach to the air and as a result, condensation occurs on the plastic bag.</p>		Increase	Decrease	as before	on plastic bag	W/O					W				
	Increase	Decrease	as before	on plastic bag														
W/O																		
W																		

Learning Activities	Time	Teaching/ learning materials	Points to be noticed.												
<p>If wet sand and dried sand are put separately into the same sized cups. Then, the two cups will be covered with plastic bags. After about two days, what significance will be found? Let the children think and let them discuss. After that let them choose from the following answers.</p> <ol style="list-style-type: none"> 1. as it was before 2. dried out 3. water hangs on the plastic bag. <p>Tell them to give reasons why they have chosen like that.</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>-</p> <p>-</p> <p>-</p> </div> <p>Do not tell either right or wrong to the children's opinions. Tell them to put equal volume wet sand and dried sand to the same sized cups. Then, ask them to cover the cups with plastic bags. Tell them to place in a row the stated cups at the corner of the room. Tell them that they will be observed after about two days. Have the children do the experiment. Then, if a little water is poured down and let it wipe with a towel or a sponge, ask children what will happen? Let them think and discuss. Note down the children's answers.</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p> </p> </div> <p>Ask why do they think it would happen like that</p> <p>Reason</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p> </p> </div> <p>Ask children to do experiment</p> <p>Finding.</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>Sponge or towel absorbs water. In other words, water diffuses into the sponge or towel.</p> </div>	<p>10</p> <p>5</p> <p>10</p> <p>5</p>	<p>Same sized cups, plastic bags, wet sand, dried sand, rubber band</p> <p>Water, sponge towel.</p>	<p>Take tally to record.</p> <table border="1" style="margin: 10px auto;"> <thead> <tr> <th></th> <th style="writing-mode: vertical-rl; transform: rotate(180deg);">as before</th> <th style="writing-mode: vertical-rl; transform: rotate(180deg);">Dried</th> <th style="writing-mode: vertical-rl; transform: rotate(180deg);">Water</th> </tr> </thead> <tbody> <tr> <td>Wet</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Dried</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>Water from the wet sand evaporates into the air. However, as it is covered with a plastic bag it does not reach to the air and as a result, condensation occurs on the plastic bag.</p> <p>The water reaches inside the sponge. The sponge absorbs water.</p> <p>Since the sponge is spongy, it has spaces for air to hide. Because, the water can replace in that spaces.</p>		as before	Dried	Water	Wet				Dried			
	as before	Dried	Water												
Wet															
Dried															

Learning Activities	Time	Teaching/ learning materials	Points to be noticed.
<p>According to the experiment, cup 3 containing dried sand has no changes. Why?</p> <div data-bbox="404 455 776 508" style="border: 1px solid black; height: 23px; width: 229px; margin: 5px 0;"></div> <p>According to the experiment, in studying the cup 4 containing wet sand the water drops are found hanging on the plastic bag. Why?</p> <div data-bbox="404 614 776 666" style="border: 1px solid black; height: 23px; width: 229px; margin: 5px 0;"></div> <p>According to the stated experiments let them review;</p> <ol style="list-style-type: none"> 1. The water losses/reduces is due to evaporation into the air. 2. When the plastic bag prevents to evaporate into the air, condensation occurs and the water remains on the plastic bag. 3. When the water diffuses into the ground, it takes up the spaces where the air hides. <p style="text-align: center;">Conclusion:</p> <p>Let them review that water can evaporate into the air as well as it can diffuse into the ground.</p> <p>Let them write the stated concept inside the notebook.</p>	<p>10</p> <p>5</p> <p>5</p>		<p>Let the children review first, if the children cannot review the teacher has to lead.</p>

Lesson Plan 12-3

Lesson topic: Different soil 1
 Learning objectives: Be able to acquire that soil from different places has different features.
 Teaching/learning materials: Different soils collected from the study trip. (In case of inability to go study trip, teacher has to collect different soils in advance.) Clear cups
 Teaching period: Inside the class (1) period
 Teaching/Learning procedure

Learning activities	Time	Teaching/learning Materials	Points to be noticed																				
<p style="text-align: center;">Introduction</p> <p>In Grade I, it have been already learnt that state, texture, color and odor are different between mud and sand. Again, the properties of mud and sand have been already learnt in Grade II. Therefore, it will be find out that there are other various soils besides mud and sand and their characteristics through doing experiments in Grade III.</p> <p style="text-align: center;">Development/Core</p> <p>The soil bags 1,2,3,4 will be all on the table. As it has been known that the soils in the bag are collected from the different places, it has to experiment on what the characteristics they have. Distribute about four clear cups to each group. Let fill the water to half of the cup. Then put about two spoonful of soil into the cup and stir with the steel spoon. - Mark (1), (2), (3), (4) etc. on the cup with the marker. -What will happen to the soil mixture in these cups next two days?</p>	5																						
<p>-Have the children think and choose one of the answers shown below.</p> <p>(1) There will be no changes (2) Soil will deposit at the bottom and water will be on the soil. (3) The different soil will be deposit layer by layer.</p> <p>Ask them why they choose these answers.</p>	10	<p>Record by taking tally</p> <table border="1" data-bbox="1068 1242 1455 1410"> <thead> <tr> <th>Cup</th> <th>Ans.:1</th> <th>Ans.: 2</th> <th>Ans.: 3</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Cup	Ans.:1	Ans.: 2	Ans.: 3	1				2				3				4				
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Lesson Plan 12-4

Lesson topic: Different soil 2
 Learning objectives: Be able to describe that soil from different places has different characteristics.
 Teaching/learning materials: Cups containing mixture of different soils
 Teaching period: 1 period
 Teaching/Learning procedure

Learning activities	Time	Teaching/Learning Materials	Points to be noticed																																			
<p>Introduction Teacher tells the students to bring the experimented cups containing mixture of different soils and they will have to observe what will happen to the soils in the cups.</p> <p>Development/core Observation on the conditions of the cups 1,2,3, and 4 after two days</p> <p>Sharing outlooks and discussion</p> <p>Presenting the findings</p> <p>Cup (1) <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td> </td></tr><tr><td> </td></tr><tr><td> </td></tr><tr><td> </td></tr></table> Cup (2) <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td> </td></tr><tr><td> </td></tr><tr><td> </td></tr><tr><td> </td></tr></table> Cup (3) <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td> </td></tr><tr><td> </td></tr><tr><td> </td></tr><tr><td> </td></tr></table> Cup (4) <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td> </td></tr><tr><td> </td></tr><tr><td> </td></tr><tr><td> </td></tr></table></p>																	<p>5</p> <p>10</p> <p>5</p>		<p>Record the findings on the blackboard</p> <p>(1) Gravels (2) Sand (3) Mud (4) Plants/animal</p>																			
<p>Differentiating the type of soil according to the findings on the similarities and dissimilarities of all cups.</p> <p>(1) (2) (3) (4)</p> <p>Have the children fill up the characteristics of the different type of soils in the following table.(10mins)</p> <p>Conclusion (5mins) By looking at the table, various soils are different in color, texture, size, shape, odor, containing of plant and animals. Therefore, have the children review that various soils have different characteristics. Have the children write the above concept in the notebook</p>	<p>Example of the table</p> <table border="1"> <thead> <tr> <th>Type of the soil</th> <th>Color</th> <th>Texture</th> <th>Size</th> <th>Shape</th> <th>Odor</th> <th>plants and animals</th> </tr> </thead> <tbody> <tr> <td>Gravels</td> <td>Whitish gray</td> <td>rough</td> <td>about rice grain</td> <td>various</td> <td>none</td> <td>none</td> </tr> <tr> <td>Sand</td> <td>Whitish gray</td> <td>rough</td> <td>about broken rice</td> <td>Sand granule</td> <td>none</td> <td>none</td> </tr> <tr> <td>Mud</td> <td>Yellow</td> <td>fine</td> <td>rice flour</td> <td>dirt</td> <td>mud odor</td> <td>none</td> </tr> <tr> <td>Plants/ dead animals</td> <td>Polluted</td> <td>fine</td> <td>various</td> <td>various</td> <td>putrid smell</td> <td>none</td> </tr> </tbody> </table>			Type of the soil	Color	Texture	Size	Shape	Odor	plants and animals	Gravels	Whitish gray	rough	about rice grain	various	none	none	Sand	Whitish gray	rough	about broken rice	Sand granule	none	none	Mud	Yellow	fine	rice flour	dirt	mud odor	none	Plants/ dead animals	Polluted	fine	various	various	putrid smell	none
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Assessment (water)

Point of Assessment

Interest/Attitude/ Motivation	Scientific thinking	Technique	Knowledge and understanding
Is she/he interested in the facts about water sources are related to each other and where does water go instead of running one place to another?	Is she/he able to imagine how water sources are related to each other?	Is she/he able to fill the table which is showing how water sources are related to each other?	Is she/he able to understand where a certain water sources comes from and where it goes or by which way it disappears?
Is she/he interested in the experiments on water evaporates into the air as well as diffuses into the ground?	Is she/he able to predict before the experiments and find out some ideas from the activities?	Is she/he able to conduct the experiment?	Is she/he able to understand water evaporates into the air as well as diffuses into the ground?
Is she/he motivated to learn the facts that water sources are related to each other?	Is she/he able to imagine where does water go?	Is she/he able to communicate with the teacher and other students such as expressing their ideas, listening to the teacher and the other students and asking questions to the teacher etc..?	Is she/he able to understand how water sources are related to each other?
Is she/he motivated to participate in the experiments?	Is she/he able to imagine water evaporates (if you cover the cup with plastic, the evaporated water can't go into the air and it condenses on the plastic) and diffuses into the ground?	Is she/he able to conduct all the experiments and activities?	Is she/he able to identify water evaporates into the air as well as diffuses into the ground?
Is she/he positively carrying out all the activities?			

1. What are the different water sources?
2. How does water from a well get full in rainy season?
3. How does water from a stream get less in summer?
4. In which ways water in a stream can be filled?
5. In which ways water in a steam can be lost?
6. How can you test water from wet sand evaporates?
7. How does water from the table diffuses into the sponge or towel?
8. Why does the ground absorb water?

1-5: To test children understanding, how water sources are related to each other through their own experiences.

6-8: To test children understanding through their experiments.

Written Test

1. Draw a diagram on how water sources are related to each other. (not to take from the showed picture, but from their own experiences)
2. How can they know water evaporates into the air, give some other examples with brief explanation.
3. How can they know water diffuses into the ground, give some other examples with brief explanation.

Assessment (Soil)

Point of Assessment

Interest/Attitude/ Motivation	Scientific thinking	Technique	Knowledge and understanding
Is s/he interested in relation with the characteristics of different soils from different places?	Is s/he able to relate the changes of condition of different soils and different places?	Is s/he able to carry out the activity? (Recording the records of the observation of soils and experimenting with the glass.)	Is s/he able to understand the changes of condition of different soils depending on different places?
Is s/he motivated to learn in relation with soil?	Is s/he able to think the relationship of different soils and different places?		Is s/he able to understand the relationship between different soils and different places?
Does s/he like to study the different soils?			

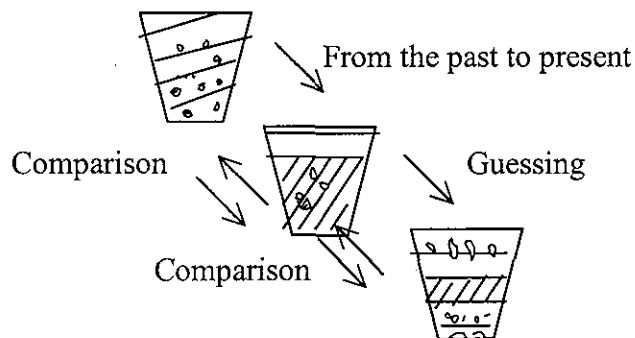
This lesson contains many observations. Achievement can be assessed by the skills of children in observation.

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

Test the activity of children

The table to observe the:

- 1. the cultivated soil and the soil from livestock farm in one's school, ward or village.
 - 2. the soils near the banks of river and streams.
 - 3. the soils near the hills or mountain sides.
 - 4. the soils of school.
- Exchanging what one has noted down through consultation the presence of small animals or trees in the soil, smell, shape, size, touch and color of soil on every trip.
 - Put the soil from the soil bags into three cups and keep each answer with each reason.
 - To differentiate the types of soil after about two days



1. Observing nature
2. Observing the soils from different places
3. Observing different soils have different characteristics.

Message to Teachers.

1. Interested in observing the types of soil
2. Observing correctly the different basic facts by using the five senses. For example the presence of trees and animals in the different observable soils, types of soil, color, texture, size, shape and smell etc.
3. Observation by relative thinking
 - What happened in the past and what happens now?(Comparison with the past experience and observation)
4. Observation by relative thinking. (Thinking the process)
5. Exploration by relative thinking? - What will happen? (Guessing ability)

Important points.

- After putting the soils into the glass there were no changes
- The water is on the upper layer and the soil will settle down below.
- Let them find out the dissimilar facts that different soils settle in different layers.
- Conclude by filling in the table the findings from experiment that different soils have different characteristics.

Test the children's understanding that different places have different soils and have different characteristics.

Oral assessment/Group discussion.

- What materials have to take in collecting and studying different soils?
- What activities have to carry out collectively when going?
- What characteristics do the different soils have?

Writing evaluation.

Experimenting that different soils have different characteristics and fill in the table below.

Types of soil	Color	Texture	Size	Shape	Smell	Presence of trees and animals
Pebbles						
Sand						
Mud						
Leaves and animals						

- How will you find after two days if the soil is put into three glasses?

- There will be no changes.
- The upper layer has water and the soil will settle down
- Different soils will settle down in different layers

Epilogue

This **Teacher's Guide for Basic Science** was created in March 2004 with the cooperation of the Department of Educational Planning and Training (DEPT), Ministry of Education, the Union of Myanmar, and the Japan International Cooperation Agency (JICA). This cooperation project, called Myanmar Basic Education Sector Study (MBESS), started in April 2001 until March 2004. During this period, MBESS has targeted three subjects: General Studies, Basic Science and Social Studies. It has also tried to introduce the Child-Centered Approach (CCA) into Myanmar's basic education sector. This Teacher's Guide has been produced from a CCA point of view and includes many information with interesting lesson plans.

To produce this Teacher's Guide, MBESS has established a working group which held many meetings and trials. The following are the members of the Basic Science Working Group. Their efforts are very much appreciated.

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We all hope that this Teacher's Guide will be used nationwide and help improve Myanmar's basic education.

March 2004

