

WORKING PAPER 48

**Resource Pack
for environmental educators**

**Activities to encourage environmental awareness for
Forest Reserves**

(English and Kiswahili versions)



**Frontier Tanzania
2002**

East Usambara Conservation Area Management Programme

Working Paper 48

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(English and Kiswahili versions)

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East Usambara Conservation Area Management Programme (EUCAMP)

The East Usambara rain forests are one of the most valuable conservation areas in Africa. Several plant and animals are found only in the East Usambara mountains. The rain forests secure the water supply of 200,000 people and the local people in the mountains depend on these forests. The East Usambara Catchment Forest Project has established the Amani Nature Reserve and aims at; protecting water sources, establishing and protecting forest reserves, sustaining villager's benefits from the forest, and rehabilitating the Amani Botanical Garden. The project is implemented by the Forestry and Beekeeping Division of the Ministry of Natural Resources and Tourism with financial support from the Government of Finland, and implementation support from the Finnish Forest and Park Service. To monitor the impact of the project, both baseline biodiversity assessments and development of a monitoring system are needed. The present activity is aimed at establishing baseline information on biological diversity in selected East Usambara forests.

The University of Dar es Salaam (UDSM)

The University of Dar es Salaam was established in July 1970 as a centre for learning and research in the arts and the physical, natural, earth, marine, medical and human sciences. The University is surveying and mapping the flora and fauna of Tanzania and is conducting research into the maintenance and improvement of the environment and the sustainable exploitation of Tanzania's natural resources.

The Society for Environmental Exploration (SEE)

The Society is a non-profit making company limited by guarantee and was formed in 1989. The Society's objectives are to advance field research into environmental issues and implement practical projects contributing to the conservation of natural resources. Projects organised by The Society are joint initiatives developed in collaboration with national research agencies in co-operating countries.

Frontier Tanzania Forest Research Programme (FT FRP)

The Society for Environmental Exploration and the University of Dar es Salaam have been conducting collaborative research into environmental issues since July 1989 under the title of the Frontier Tanzania Forest Research Programme (FT FRP). Since July 1994, the FT FRP has been working in the forests of the East Usambara

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FOREWORD

The East Usambara forests in northeastern Tanzania are part of the Eastern Arc mountains. More than one hundred years of biological interest and research have shown that these forests have a unique diversity of flora and fauna, and an exceptionally high degree of endemism. They have gained global recognition as being part of a Biodiversity Hotspot (Conservation International), an Endemic Bird Area (BirdLife), a Centre of Plant Diversity (WWF and IUCN) and a Globally Important Ecoregion (WWF). Since 1990, the East Usambara Conservation Area Management Programme (EUCAMP) (formerly known as the East Usambara Catchment Forest Project (EUCFP)) has worked in the East Usambara Mountains with the mission to protect these natural forests. The project is implemented by the Forestry and Beekeeping Division (FBD) of the Ministry of Natural Resources and Tourism (MNRT) with financial support from the Government of Finland, and technical support from Indufor / Metsähallitus Group.

Although a considerable amount of biological information exists from the East Usambara Mountains much of this is restricted to the Amani area and systematic surveys elsewhere are few. In order to get more comprehensive information on the forests, biodiversity surveys were initiated and contracted in July 1995. The surveys are conducted by Frontier Tanzania, a joint venture between the University of Dar es Salaam and the Society for Environmental Exploration, together with EUCAMP. The aim of the surveys is to provide systematic baseline information on the biological values of different forests as a basis for management planning and long-term monitoring, as well as training forestry staff in the use of biological inventory techniques. They will also help setting priorities in the conservation of this valuable area.

The programme involves locally employed field assistants, permanent EUCAMP, Frontier-Tanzania, University of Dar es Salaam, and Tanzania Forestry Research Institute staff, as well as an international network of taxonomists and other experts. The surveys have become progressively more systematic and quantitative, and have already resulted in the discovery of several previously unknown taxa. This will further raise awareness of the unique conservation values of the East Usambara Mountains. EUCAMP has also commissioned the development of a biodiversity database, a work which also contributed the maps to these reports. All data collected during the surveys is entered into this database, which is linked to the Tanzanian national biodiversity database held at the Department of Zoology and Marine Biology, University of Dar es Salaam.

The reports are the result of the work of many people – too many to be listed here. We would like to thank all of them for their invaluable effort. We hope that the surveys will make yet another contribution to the long historic chain of efforts to study and understand these unique forests. Perhaps even more than that we hope that this information will contribute to better management and conservation of the East Usambara Mountains so that the beauty of the area will continue to amaze coming generations and that the light in the tunnel will become the bright future.

Mathias Lema
Project Manager

Veli Pohjonen
Chief Technical Adviser

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This report is culmination of the hard work and enthusiasm in which the Frontier-Tanzania field staff, forestry officers, research assistants, local field staff and the teachers and pupils of Misozwe Primary school participated in environmental education activities. In particular acknowledgements are due to the following:

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Many thanks to the staff and pupils of Misozwe Primary School for their participation and energy during our visits, which inspired the writing of this report. The report documents lessons that Frontier-Tanzania conducted with the help of Tanga Catchment Forest Officers and it is hoped that the activities may be used by other primary school teachers in furthering their students' interest in Forest Reserves and for the natural environment.

All of the illustrations in this Pack were drawn by Sophie Oliver, except some of the factsheet sketches which were drawn by Frontier-Tanzania volunteers.

BACKGROUND

Since July 1995 Frontier-Tanzania (a collaboration between the University of Dar es Salaam and the Society for Environmental Exploration) has worked with the East Usambara Conservation Area Management Programme (EUCAMP) to survey the biodiversity of all East Usambara Mountain Forest Reserves. The East Usambara Biodiversity Surveys Project (EUBS) is implemented by the Forestry and Beekeeping Division (FBD) of the Ministry of Natural Resources and Tourism (MNRT) with financial support from the Government of Finland, and technical support from Metsähallitus Consulting.

Local community involvement in forest management and conservation is being encouraged by the Tanzanian Government, through the implementation of the most recent Forest Policy (1998). Within the 'Ecosystem Conservation and Management' section, this policy document discusses various 'visions for the future', three of which include a greater appreciation and awareness of biodiversity values, the involvement of private sector and local communities in biodiversity conservation, and to deliver extension education to local communities.

During previous EUBS work, it was clear that local communities were very interested to be involved with, and learn more about the biodiversity within their forest reserves. Throughout Tanzania and the rest of the developing world, past knowledge gained from such scientific research has often been inaccessible to local villagers and schools.

In October 2001 a new Terms of Reference was signed by Frontier-Tanzania and EUCAMP to complete biodiversity surveys of the remaining five Forest Reserves, Mlinga, Mgambo, Bombo East I and II and Derema (proposed). An additional objective was added to the Terms of Reference that would tackle this issue. The objective stated that the EUBS team would 'provide small scale feedback with regard to the survey findings through environmental education activities within school and village committee networks, in co-operation with the EUCAMP Village Forestry Programme.'

This objective was first implemented within Mlinga Forest Reserve. The experiences gained in Mlinga have been documented as a EUCAMP Technical Paper. This 'Resource Pack for Schools' is the product of the hard work and dedication of a small group of Frontier-Tanzania staff, research assistants, field staff, Forestry Officers and Forestry Assistants. We hope that this document can be used as a resource by school teachers, to help increase awareness about their surrounding environment.

Susannah Hall
Research Coordinator

PURPOSE OF RESOURCE PACK

- | | |
|---------------------------|--|
| <u>Mission:</u> | To increase interest, respect and the sense of responsibility for Forest Reserves within the East Usambara Mountains . |
| <u>Aims:</u> | <ol style="list-style-type: none">1. To promote self-responsibility for protecting and utilising Forest Reserves.2. To encourage respect and interest for the natural forest habitat.3. To increase awareness of the role of a Catchment Officer. |
| <u>Objectives:</u> | <ol style="list-style-type: none">1. To promote an understanding that Forest Reserves are special.2. To promote an understanding that Forest Reserves need looking after.3. To promote an understanding that the Forest Reserves are ‘yours’ to cherish. |

1. INTRODUCTION TO THE EAST USAMBARA MOUNTAINS

Author: Oliver, S.A. Pp. 1-2

The East Usambara Mountains are part of the Eastern Arc Mountain Range. The Eastern Arc is largely in Tanzania and a little in southern Kenya. Areas included in it are, Taita Hills (Kenya), Pare, Usambara, Nguru, Uluguru, Ukaguru, Rubeko, Udzungwa, Mahenge and Matengo mountains.

The East Usambara Mountains are important as they are high ground attracting rain to fall from clouds forming over the Indian Ocean; usually the rainfall is around 2000mm per year. Often people imagine that Kilimanjaro would form part of this range but, in fact, Kilimanjaro is very 'young' in comparison with the Eastern Arc Mountain Range. The Eastern Arc was formed over 30 million years ago, whereas Mt. Kilimanjaro was only formed 1 million years ago.

The East Usambara Mountains, and other Eastern Arc mountain ranges are very fragmented patches of forest. They contain a very large proportion of rare and unusual plants and animals not found anywhere else in the world (animals and plants that are only found in one place like this are referred to as 'endemic').

Some special species of plants and animals only found in the Eastern Arc are written below:

African violet	Usambara eagle owl
Blackwood	Swynnerton's robin
Zanzibar galago	Usambara three-horned chameleon
Red colobus monkey	Usambara dwarf gecko
Zanj elephant shrew	Usambara torrent frog
Eastern tree hyrax	Dead-leaf toad

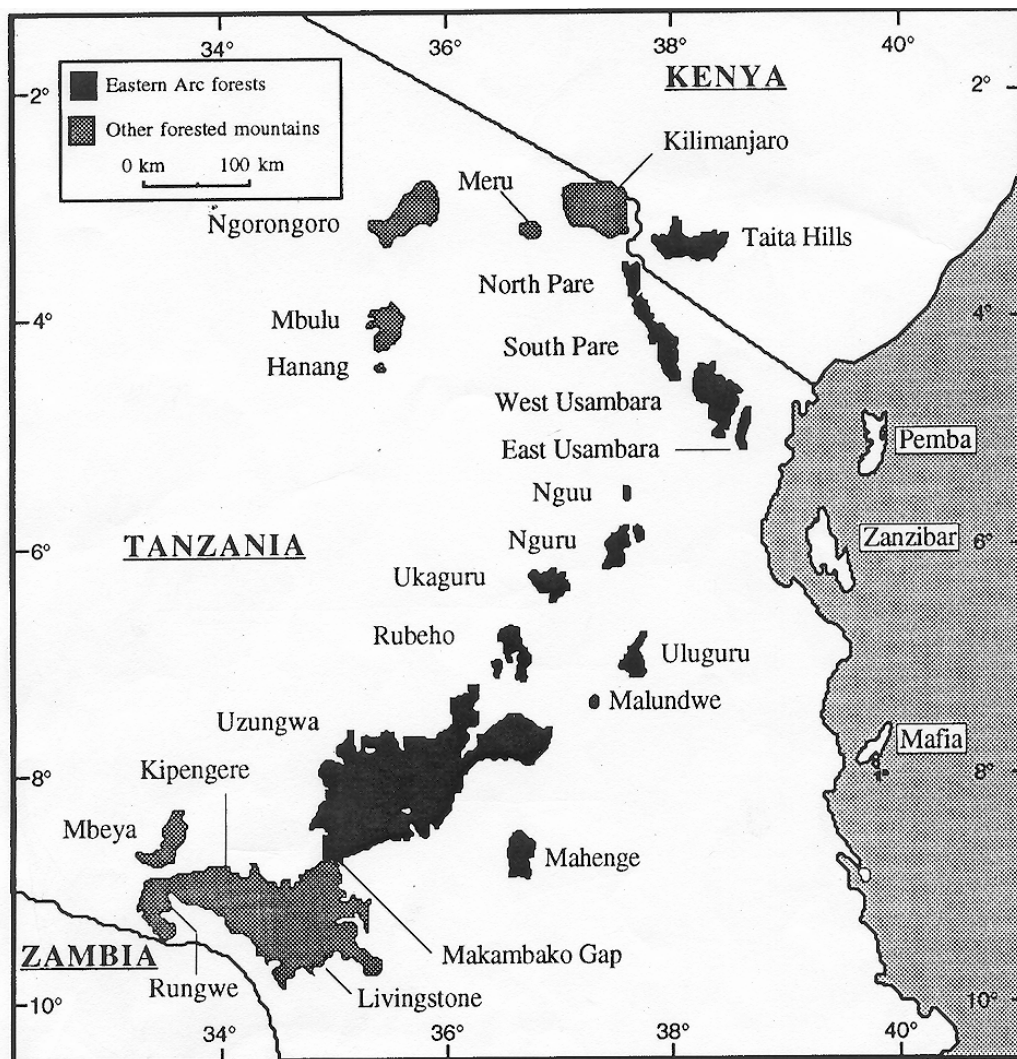
Organisations such as World-wide Fund for Nature (WWF), Birdlife International and the International Union for the Conservation of Nature and Natural Resources (IUCN) have all prioritised this area for conservation attention.

The area has suffered in the past from widescale logging and forest clearance for tea, sisal, pine and teak plantations (many set up by the British and German prior to independence). This led to soil erosion as deforested areas were often given over to crop cultivation.

The East Usambara Mountains is threatened because it has lost 70% of its original expanse in the last 50 years. There is a very high population density (figures?) (for an agriculture-based economy). There is protection from the Forestry Division and the scheme for community-based conservation for local forest reserves is being initiated.

(Information adapted from: Mittermeier R.A. *et al* (1999), Hotspots, Earth's Biologically Richest and Most Endangered Terrestrial Ecoregions. Toppan Printing Co. Japan.)

Map of the East Usambaras, within the Eastern Arc Mountains



The forest areas of the Eastern Arc Mountains

Map taken from: J.A. Isango (2001), A Partially Annotated Bibliography of Biodiversity Studies in the Eastern Arc Mountains, Tanzania Forestry Research Institute (TAFORI).

2. LESSON PLANS

Author: Oliver, S.A., Hall, S., Wheeler, J., Ntemi, A.S & Mtango, J. Pp. 3-14.

1. The Role of a Forest Catchment Officer

Emphasis: Environmental Awareness

Age group: 6+

Lesson length: 30 min

Aim: To increase awareness of the way a Catchment Officer is working to help conserve 'their' forest.

Objectives: The Talk should enable children to answer the following questions:

1. What is a Forest Reserve?
2. Why are they important?
3. Who do they belong to?
4. Why do we need to look after them?

Resources: Blackboard and chalk
Map of East Usambara Mountains, showing Forest Reserves*
Poster of East Usambara endemic species*
(*Optional)

Setting: School grounds or Classroom

Methodology:

1. Introduction: Start with a number of questions to ascertain the level of comprehension already within the class. For example: "What is a Catchment Officer?", "Where does he/she work?", "Does anyone know why Forest Reserves are important?". Draw out ideas and expand on these using the 'Suggested Content' pages that follow as a guideline. (10 min)
2. Explain any missing information and ask "What groups of people might a Catchment Officer work with?" Discuss and expand upon. (10 min)
3. Give time to encourage a questions and answer session. Try to eliminate any misconceptions the children may have. (10 min)

Suggested Content for Catchment Officer Talk

Goal

To increase the children's interest, respect and sense of responsibility for local Forest Reserves.

Key questions to address during visits:

- What is a Forest Reserve?
- Why are they important?
- Who do they belong to?
- Who looks after them?
- Where would we be without them?

What is a Catchment Officer?

A Catchment Officer works with local village people to help them make use of Forest Reserves in a way that doesn't damage them. There are Catchment Officers in charge of all of the Forest Reserves in the East Usambara Mountains. The Government has created these jobs because they know how important the forests are to the local people.

What is a Forest Reserve?

These are important areas of land because they contain:

- the water source for surrounding villages
- a fuel-wood source
- rare animals and plants not found anywhere else in the world
- other useful resources (like timber, medicinal plants and honey)

The Government knows how important these areas are for the local villages and so it has protected them.

What does a Catchment Officer do?

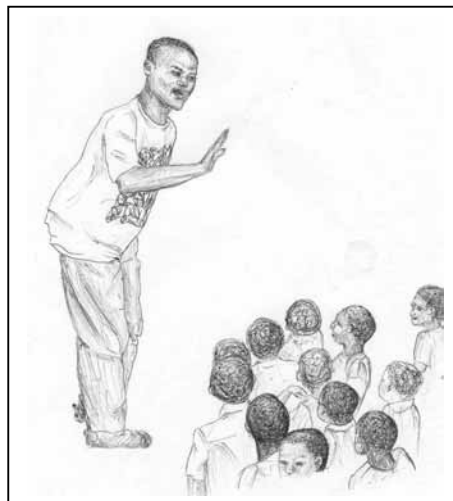
A Catchment Officer encourages villagers who live close to Forest Reserves to look after them properly. He/she talks to village Environmental Committees and other groups to improve the way we use our forests.

The Forest Reserves are a 'resource' - which means that they are ours to use, but we must use them carefully if we are to enjoy them for years to come.

Some of the things a Catchment Officer is involved with are:

1. **Creating tree nurseries.** These are important to stop people illegally cutting down trees in the Forest Reserves to use for building materials. We can plant tree nurseries in our schools to teach us how to grow and care for our trees, and we can then use or sell the trees to raise money.

2. **Creating wild vegetable nurseries** in villages. This is to stop people illegally harvesting wild plants from the forests and so that they have nice things to eat and to sell in town.
3. **Teaching people how to light safe fires** that do not burn down the forest by mistake. People must tell the village Environmental Committee before they light fires, otherwise they will be fined. Catchment Officers teach them how to clear vegetation around their farms and keep watch on fires so that they do not spread beyond their fields and into the Forest Reserve.
4. **Trying to stop illegal hunting.** Any form of hunting or harvesting (except for collecting dead wood) is against the law in Tanzania in Forest Reserves. People caught hunting are punished by the Government. Hunters often start fires by mistake that burn off large areas of forest. It is a real problem as the forest burns very quickly in the dry weather. Lots of plants and animals die in the fires and it destroys the reserve.
5. **Improving cooking stoves.** We all use a lot of firewood to cook our food. Catchment Officers help to promote new clay stoves that use much less firewood than open fires. This is great, as it means less wood needs to be gathered each day and it means less damage to our Forest Reserves. It is a stove that we can make in our villages. Do you have one at home?
6. **Encouraging beekeeping groups** in villages. Villages can keep bees and then share the honey and sell any they have left over. This is good because everyone likes honey and it stops people going into the Forest Reserve and illegally harvesting wild honey.
7. **Encouraging fishkeeping** in pools to help stop people illegally hunting in the forest. This is possible in villages that get a lot of rain.



Forest officer teaching pupils about Forest Reserves

2. Environmental Trail

Emphasis: 1. Science
2. Geography (Extension/follow-up lesson)

Age group: 6+

Lesson length: 30 min

Aim : To increase awareness of the “immediate” environment.

Objectives: 1. To explore biodiversity in school grounds, e.g. (signs of) animals, plants,
trees, insects/butterflies, through observation of the grounds.
2. To be able to geographically represent features of the environment.

Resources: Plain paper
Wax crayons
Writing pencils
Binoculars, butterfly sweepnets, magnifying glasses, specimen pots, compasses, sound-recording/playing equipment*
(*non-essential, suitable for lesson extension ideas. May be safety issue with magnifying glasses in dry grass)

Methodology:

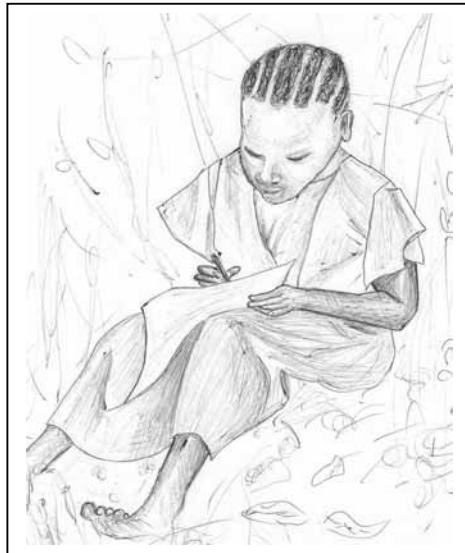
1. Choose a location in the school grounds and ask the children what they understand the word “environment” to mean (this can be done as an introduction or as a reminder at the end of the lesson if children are already familiar with the word). (5 min)
2. After establishing that it is “the world around us” (or other similar definition), say that we are looking for living things within the school environment and/or signs of things that have been there. Will need to consider how to go about this without damaging grounds etc. (5 min)
3. Distribute drawing apparatus and show any other resources.
4. Split into smaller groups to look for signs, such as bird nests, bark/leaf rubbings, flowers, birds/butterflies/insects. Find as much as possible within 20 min.
5. Reassemble to discuss what was found. Look at good examples. Comment on findings.

Lesson Extension:

6. After returning to classroom, draw a map of the school and where living things were found. This can be extended further for more able/older children by increasing the area to include village, rivers, Forest Reserve, catchment areas.
7. A sound environmental trail, listening for evidence, recording and identifying sounds.
8. Use more technical equipment. Measuring trees, collecting insects etc.
9. Introduce more technical scientific terms to the environmental trail, e.g. invertebrates/vertebrates.
10. Change the emphasis of the trail from natural signs to looking for signs of man's uses of/impacts on the environment. Examples of impact may include: burning, cultivation, water taps, brick furnaces, grazing, medicinal uses of trees. This could lead onto discussions on environmental concerns back in the classroom.

Evaluation:

Evaluate how the lesson went by using feedback from children, general comprehension of the term “environment” and the interpretation of children's work sheets.



Pupil recording items encountered on her Environmental Trail

3. What's in the bag?

Emphasis: 1. Science
2. Language

Age group: 6+

Lesson length: 30 min

Aim: To increase awareness of the variety of living things found in the Forest Reserve.

Objectives: 1. To aid recognition of living things.
2. To increase use of descriptive language.

Resources: Cloth drawstring bags (at least 2 per group of 10 children).
Assorted objects found in forest, for example:

- Shells
 - Seeds/seedpods
 - Feathers
 - Birds' nests
 - Fur
 - Bark
 - Dry grass/fresh grass (reference to fire risk)
 - Teak leaves (reference to border marker trees)
- Cassette player and blackboard*

(*Required for lesson extension idea)

Methodology:

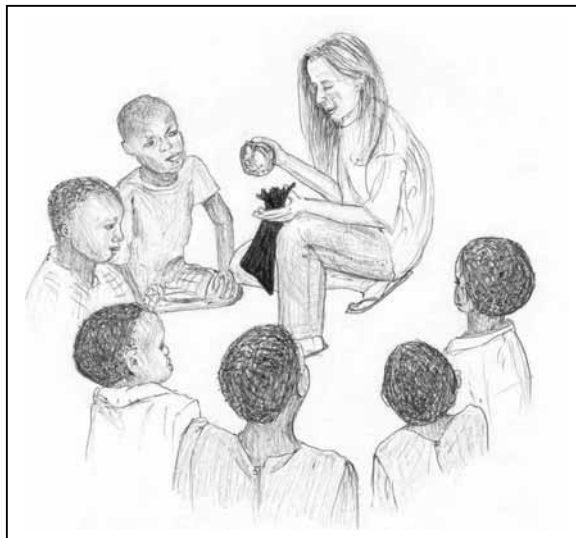
1. Sit the children down into groups of approximately 10 in a circle with one teacher/Kiswahili speaker per group and other helpers.
2. Explain that there are natural things from the Forest Reserve inside the bag.
3. Pass the bag around and, without them looking inside, ask the children to put a hand into the bag to carefully feel what's inside and for them to use one word to describe how it feels. Each must be a different word from the previous one. They must not say what is in the bag at this stage.
4. After the last child has had a go, ask each child in turn what they think it might be. Reveal the object to show if they were right and pass it round again if required.
5. Repeat this process until the end of the session (about 5 objects). Exchange bags with other groups as required.

Lesson extension:

6. Play sounds on a tape so the children draw what animals they can hear within a 5 min (or given) period. Then go through the tape again commenting when sounds are heard (writing/drawing on board to illustrate).

Evaluation:

The children's ability to guess the objects correctly and skill improvement.



Volunteer revealing 'what's in the bag' to group of children

4. Writing a Group Story

“One day I went to the forest and I saw...”

Emphasis: 1. Environment Awareness
2. Language
3. Drawing*

Age group: 7+

Lesson length: 30 min

Aims: To highlight the diversity of life in the Forest Reserve and to emphasise its importance and the need for local people to help conserve it.

Objectives: 1. To discuss problems affecting forests.
2. To discuss how to conserve them.
3. To think of a well-constructed story with distinct beginning/middle/end.
4. To use descriptive vocabulary and punctuation.

Resources: Blackboard and chalk
A4 book made of white card and pen (at least 8 pages)
Forest Reserve endemic species poster/map of East Usambaras (optional)
Wax crayons/colour pencils*

(*For illustrating the story, as a lesson extension)

Methodology:

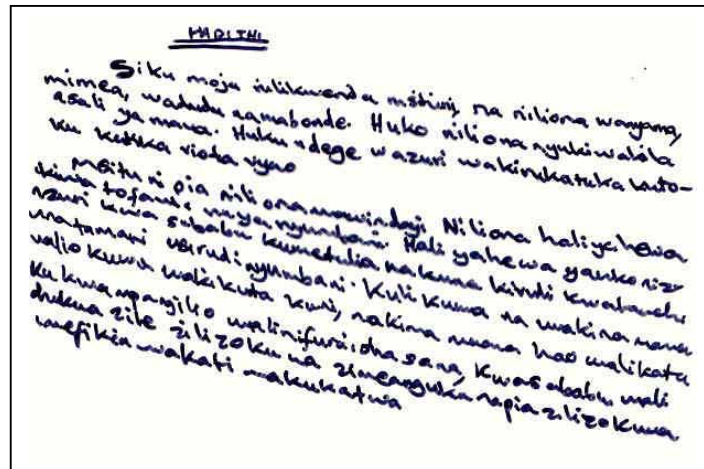
1. Ask the children what animals they might expect to see in the Forest Reserve, how people might use the forest and what might harm the forest. List ideas on the blackboard.
2. Explain that they are going to write a joint story. Start the story off by writing on the board: “One day I went to the forest and I saw...” and ask a child to suggest the next line, using an animal, for example. Suggest scenarios (where necessary) to make the story flow.
3. Write the sentences on the blackboard (and a scribe should record the story as it is constructed into a class book). Ideally, after the start, there should be a couple of descriptive sentences to set the scene. Then, as the ‘walk’ goes further, activities in the middle of the story will be resolved (for good or bad) at the end.
4. For older children, the middle part of the story should be about 10 sentences and finishing at least a couple of these with a ‘message’.

Lesson extension:

5. This concept could be also used with younger children. An example story should be read out in class to illustrate what is required.
6. Individual stories made up by the children.
7. Illustrating the class book..

Evaluation:

This activity can act as a summarising exercise to consolidate what has been learnt during the school visit. This activity (or the Poster Drawing activity) should be used as a concluding lesson to a session. Evaluation can be made from quality of story content etc.



One pupil's own environmental story

5. Design a Poster

Emphasis: 1. Environmental Awareness
2. Drawing/Design

Age group: 5+

Lesson length: 30min

Aim: To demonstrate an understanding that the Forest Reserves belong to all of us and we need to work together to conserve them for the future.

Objectives: 1. To concisely plan a message on how to look after the Forest Reserve.
2. To be able to illustrate the message in a relevant way.

Resources: A4 paper for each child
Assorted drawing and colouring pencils/crayons
Poster of East Usambara endemic species*
Map of East Usambaras*
(*optional)

Methodology:

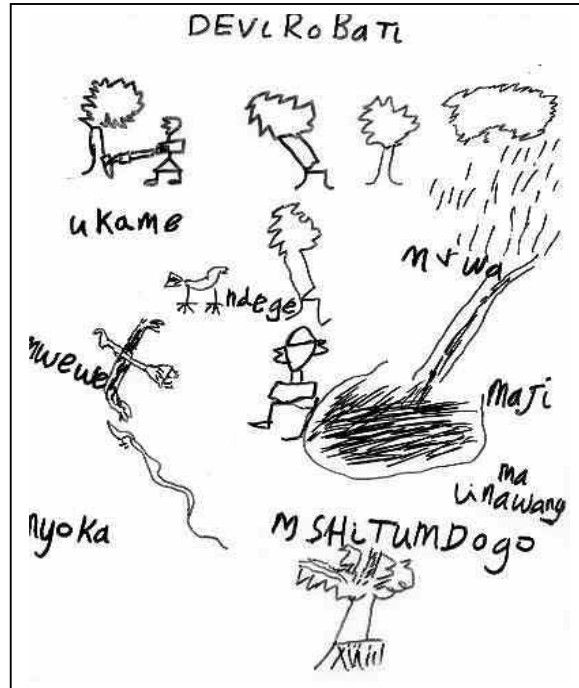
1. In a question/answer session, ask the children why the Forest Reserves are important and what might harm them (e.g. hunting, water pollution, timber-felling). Then, discuss with them ways of looking after the forest. Write ideas on the blackboard.
2. Ask the children to design a poster that will persuade people to conserve their Forest for the future.

Lesson extension:

3. For older children (8 yrs+), poster content and drawing detail can be more complicated, and posters could contain more text.

Evaluation:

This activity can act as a summarising exercise to consolidate what has been learnt from previous lessons.. The posters can be used as evidence of the level of comprehension the children have on the importance of the Forest Reserves and they can be displayed in the classroom.



A pupil's environmental poster

6. Discovery Table

Emphasis: 1. Diversity of Nature's design

Age group: 5+

Lesson length: 30min

Aim: To encourage knowledge of natural items by making a game of deciding what each item is.

Objectives: 1. To increase children's awareness of nature that surrounds them.

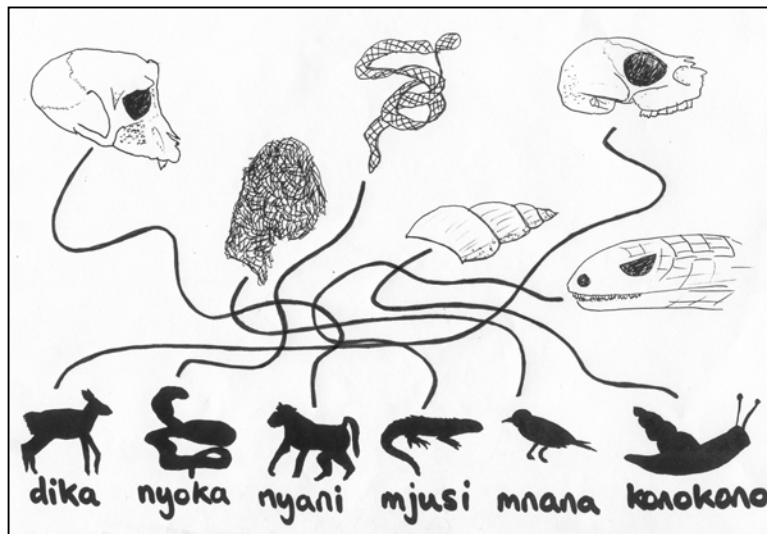
Resources: Assorted natural items from the forest, for example: skull, snake skin, fur, shell, seedpod, bark.

Methodology:

1. Arrange a number of interesting forest items on a table and ask children to say what animals/plants the items come from.

Lesson extension:

2. Children could collect their own items to make their own discovery tables. They could draw pictures of the animals/plants that the items came from and think about characteristics of those items.



A picture linking forest items with their corresponding animals

3. ACTIVITY SHEETS

Authors: Oliver, S.A. Pp. 15-53.

1. Crosswords

Aims:

1. To increase awareness of Forest Reserve biodiversity, and its importance.
2. To develop language skills.

Objectives: To improve reading and spelling and crossword problem-solving skills.

Resources: Crossword sheets
Writing pencils

Methodology:

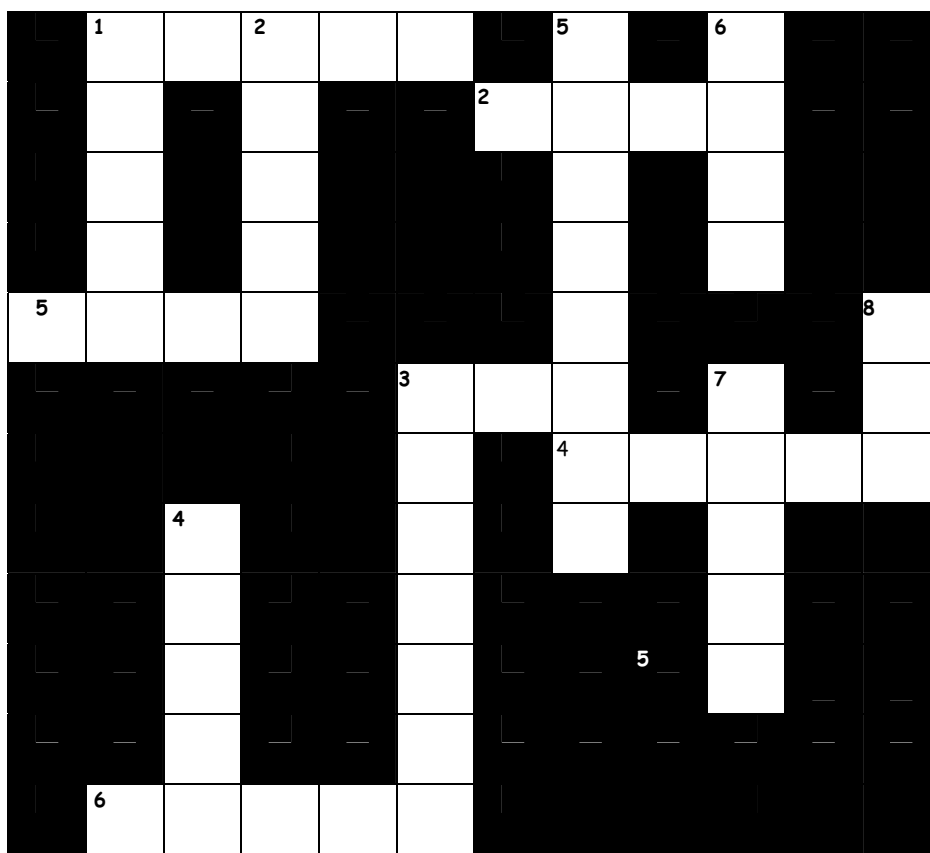
1. Explain what a crossword is (or ask older children to explain), i.e. that the words fit together and that the answers are hidden in the clues.
2. Read the first clue as an example, and fill in the answer. Then show that any letters that go across another word must be in that word too and in the correct position. Complete a second clue if necessary. Distribute the sheets.

Evaluation: Outcome/completion of crosswords.

Extension: By the number and complexity of clues/words.

Example Crosswords

CROSSWORD 1



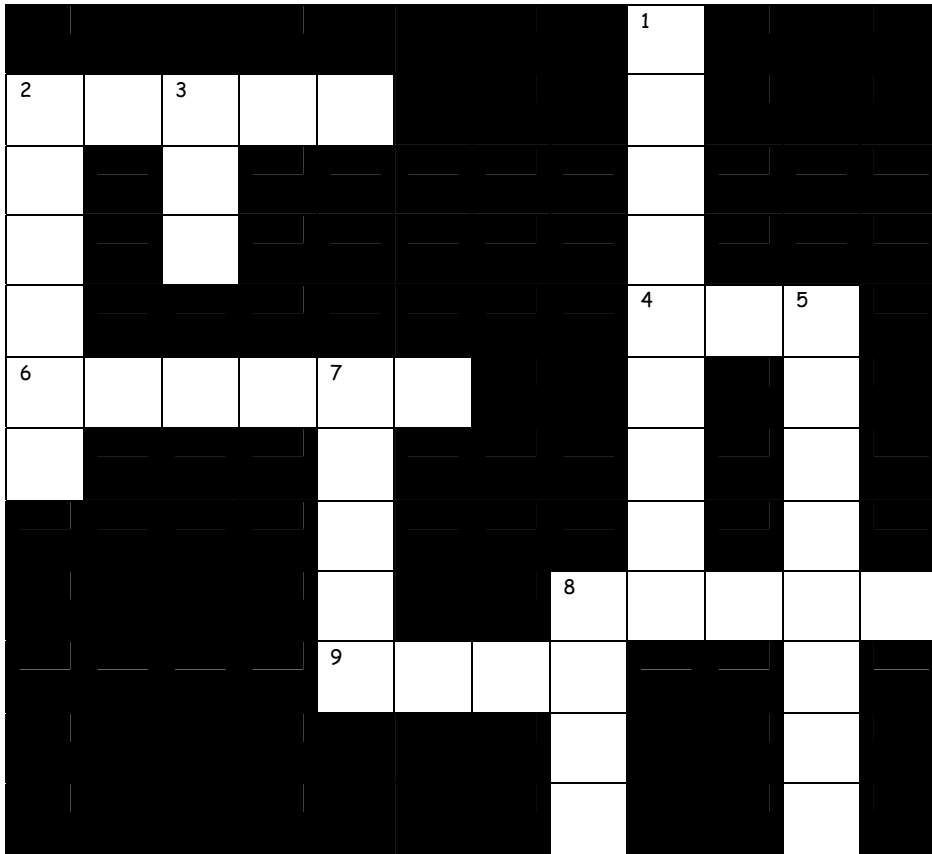
Across: (correct answers to crossword are in Kiswahili)

1. An animal in trees and caves making loud noises at night. (Hyrax)
2. This is necessary to cook with. (Fire)
3. You can get water from it. (River)
4. A bit like a human being, this animal lives in the forest. (Baboon)
5. A tree often planted to mark out forest boundaries. (Teak tree)
6. A bird that flies at night making a 'whooo' noise at night. (Owl)

Down:

1. A flying, hopping insect that birds like to eat. (Grasshopper)
2. A bit like a snake, but this animal has legs. (Lizard)
3. A tree type with very large smelly fruits we like to eat (Jackfruit)
4. The place where trees, plants and animals live. (Forest)
5. This animal moves slowly with its house on the back. (Snail)
6. This animal flies at night and likes to hang upside down. (Bat)
7. A small animal with whiskers and a tail. (Rat)
8. A large bird, that likes to swoop and catch live animals. (eagle)

CROSSWORD 2

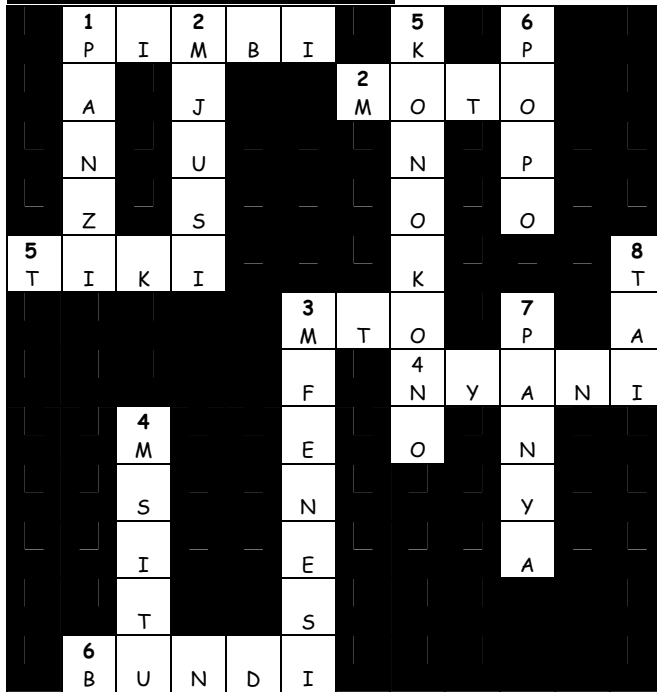
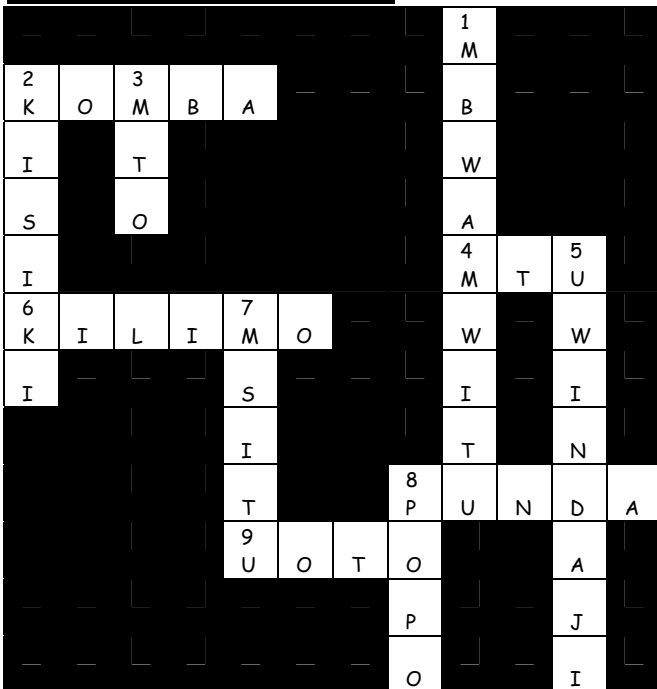


Across: (correct answers to crossword are in Kiswahili)

2. A small animal, known to like liquor! (Bushbaby)
4. A human being. (Person)
6. The practice of people growing food and cash crops. (Agriculture)
8. Animal used by people to carry things. (Donkey)
9. When a plant is small and gets bigger. (Regeneration)

Down:

1. A type of dog that lives in the forest. (Wild-dog)
2. What is left of a tree after it is cut down. (Stump)
3. Water flowing in a definite channel. (River)
5. An activity that involves killing of animals. (Hunting)
7. The place where trees, grasses and animals all live. (Forest)
8. An animal that flies at night and hangs upside down. (Bat)

Crossword 1 (Answers)**Crossword 2 (Answers)**

2. Dot-to-dots

Aims: To aid visual perception of the forest environment.
To encourage confidence with numbers

Objectives: To facilitate the sequencing of numbers

Resources: Dot-to-dot sheets
Writing and colouring pencils

Methodology:

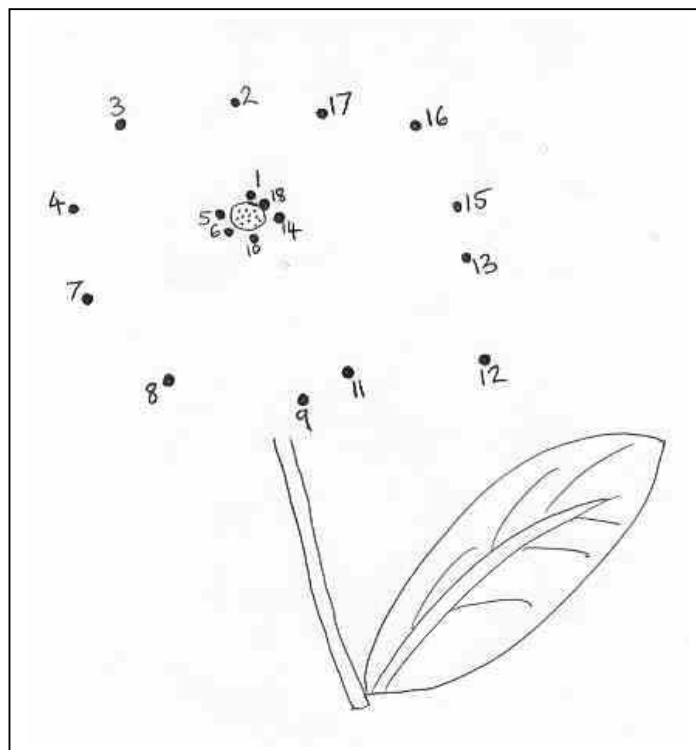
1. With younger children, direct one child to call out “one” and then the child sitting next to them to call out “two”, and so on to visualize the path from one number to the next.
2. Alternatively, simply explain that the activity requires the dots to be joined in (numerical) order and ask one child to explain what that means before giving out the sheets. The pictures formed should be of natural items found in the forest.

Evaluation: Correct pictures will be drawn.

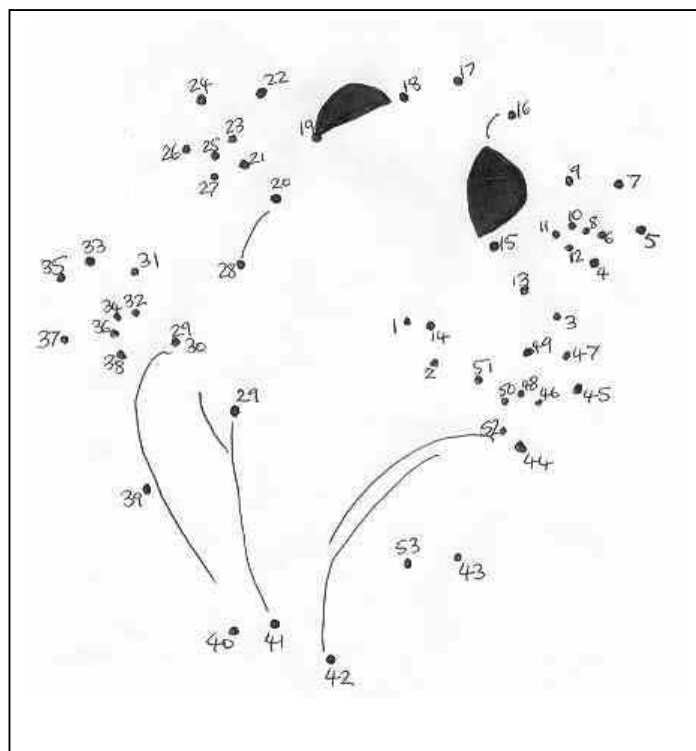
Extension: The difficulty of the exercise can be adjusted according to the number of ‘dots’ and the subject-matter of the picture. Pictures can be coloured in after completion.

Example Dot-to-dot Pictures

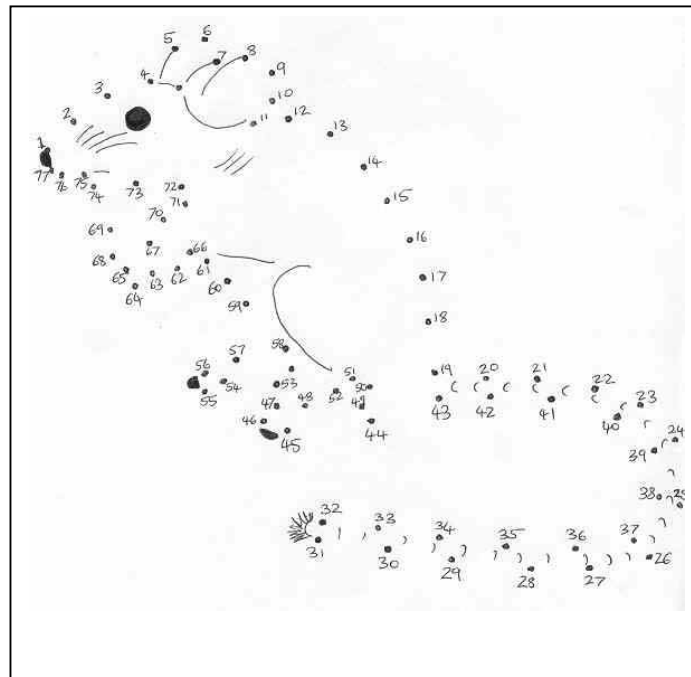
Picture 1:



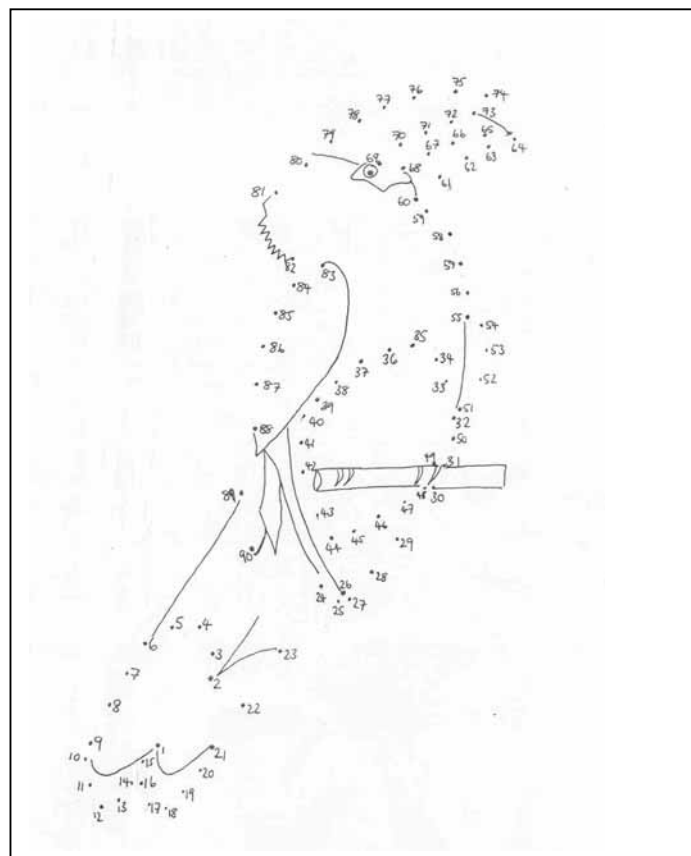
Picture 2:

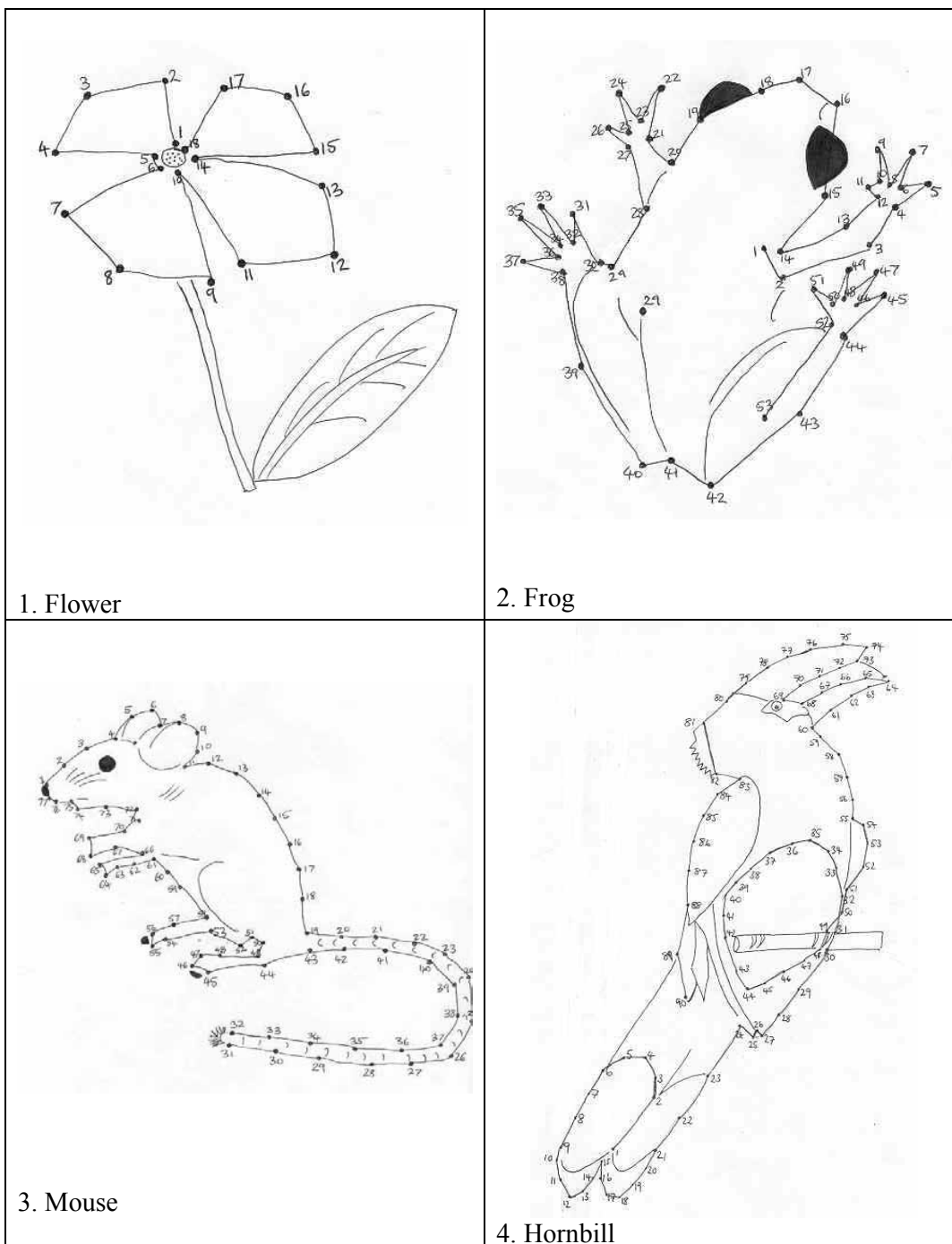


Picture 3:



Picture 4:





3. Wordsearch

Aims: To increase awareness of Forest Reserve biodiversity.
To develop spelling skills.

Objectives: To be able to transfer knowledge of a word from the bottom of the page to a grid - word-recognition and memory skills.

Resources: Wordsearch sheets
Writing pencils

Methodology:

1. Show the children the sheet and explain that the words on the bottom are hidden in the grid. Ask how can the words can be found. Look for beginning letter. Explain what happens if more than one begins with that letter?
2. Show example done and look for next word on list. Give out sheets.

Evaluation: How many words found.

Extension: More complex words/bigger grid.

Example Wordsearches

Wordsearch 1

Find the Kiswahili words from the list below in the grid.
When you find a word, circle it with a pencil,
as shown for 'popo'.

p	o	p	o	m	m
a	j	u	a	o	l
n	a	m	i	t	i
y	n	t	a	o	m
a	i	o	n	j	a

popo (bat)

moto (fire)

miti (trees)

jua (sun)

mlima (mountain)

jani (leaf)

panya (rat)

mto (river)

Wordsearch 2

Find the Kiswahili words from the list below in the grid.
When you find a word, circle it with a pencil,
as shown for 'bonde'.

b	u	n	d	i	o	d	r	a	t	k	l	m	m	n	b
o	v	w	u	e	h	u	n	i	m	a	w	i	n	g	u
n	l	l	o	u	j	e	r	j	k	i	m	a	g	u	n
d	k	j	r	m	a	j	a	n	i	w	p	l	t	a	y
e	o	a	u	i	o	d	k	v	n	a	l	s	i	u	v
j	k	t	m	t	o	t	i	l	y	d	f	k	y	m	m
t	u	m	b	i	l	i	o	a	o	n	e	b	m	l	a
s	p	a	t	s	s	l	w	k	n	s	h	g	m	l	u
h	e	n	k	n	y	n	b	e	g	a	h	y	e	l	w
y	p	f	w	y	p	a	n	y	a	v	u	a	a	u	a
b	o	h	k	a	n	o	u	g	n	b	t	g	m	m	u
k	o	r	o	n	g	o	s	n	y	u	k	i	f	b	h
m	s	y	k	i	p	e	p	e	o	a	h	k	y	e	a
s	b	a	a	u	o	a	b	v	k	i	p	a	n	g	a
i	w	s	h	y	p	y	f	y	a	o	g	m	v	u	a
t	h	o	n	d	o	h	o	n	d	o	m	g	u	h	o
u	k	i	l	e	l	e	t	p	c	h	u	r	a	l	i

bonde (valley)	kilele(noise)	korongo (crane)	mlima (mt.)	mbega (colobus)	panya (rat)
bundi (owl)	kima (blue mky)	majani (leaves)	mmea (plant)	ndege (bird)	popo (bat)
chura (frog)	kinyonga(chamln)	mauwa (flowers)	moto (fire)	njia (footpath)	shamba(frm)
hondohondo(bird)	kipanga (eagle)	mawingu (clouds)	msitu (forest)	nyani (baboon)	tumbili(vervet)
jabali(rocky)	kipepeo(but.fly)	mbegu (seeds)	mta(river)	nyoka (snake)	upepo (wind)
jua(sun)	komba (bushbaby)	miti (trees)	mvua (rain)	nyuki (bee)	watu (people)

Answers 1

p	o	p	o	m	m
a	j	u	a	o	l
n	a	m	i	t	i
y	n	t	a	o	m
a	i	o	n	j	a

Answers 2

b	u	n	d	i	o	d	r	a	t	k	l	m	m	n	b
o	v	w	u	e	h	u	n	i	m	a	w	i	n	g	u
n	l	l	o	u	j	e	r	j	k	i	m	a	g	u	n
d	k	j	r	m	a	j	a	n	i	w	p	l	t	a	y
e	o	a	u	i	o	d	k	v	n	a	l	s	i	u	v
j	k	t	m	t	o	t	i	l	y	d	f	k	y	m	m
t	u	m	b	i	l	i	o	a	o	n	e	b	m	l	a
s	p	a	t	s	s	l	w	k	n	s	h	g	m	l	u
h	e	n	k	n	y	n	b	e	g	a	h	y	e	l	w
y	p	f	w	y	p	a	n	y	a	v	u	a	a	u	a
b	o	h	k	a	n	o	u	g	n	b	t	g	m	m	u
k	o	r	o	n	g	o	s	n	y	u	k	i	f	b	h
m	s	y	k	i	p	e	p	e	o	a	h	k	y	e	a
s	b	a	a	u	o	a	b	v	k	i	p	a	n	g	a
i	w	s	h	y	p	y	f	y	a	o	g	m	v	u	a
t	h	o	n	d	o	h	o	n	d	o	m	g	u	h	o
u	k	i	l	e	l	e	t	p	c	h	u	r	a	l	i

4. Animal Footprints

Aims: To demonstrate that animals leave many clues to their existence.
To encourage future observational skills.

Objectives: To match animals with their corresponding footprints.

Resources: Track sheets:
(Track-print poster with corresponding animal picture/name underneath)*
*Optional

Methodology:

The following are suggested uses for the sheets:

1. A simple class game holding up the prints and asking which of the (pictures of) animals would be likely to make those prints.
2. As an aid on display, e.g. with title “What makes me” with tracks and flip-up effect revealing correct animal’s identification.
3. The track sheets could be used to mark environmental trails around school.
4. If put on one A4 sheet (or board) the tracks could be used as simple matching activity for the youngest children.
5. As a springboard for story-writing.

Animal Footprints Sheet

1. Baboon



2. Civet



3. Mongoose



4. Hyrax



5. Duiker



6. Squirrel

5. Animals and their Habitats

Aims: To increase awareness of animals and their natural requirements.

Resources: Cut-out pictures of animals
Sellotape®
Black board and chalk

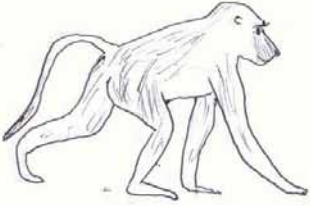
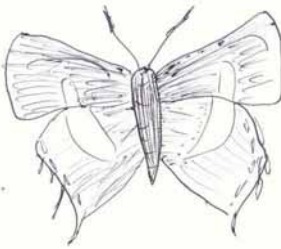
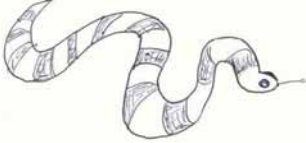
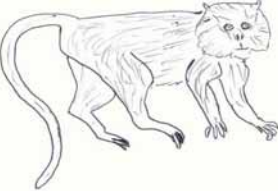
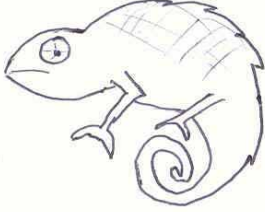
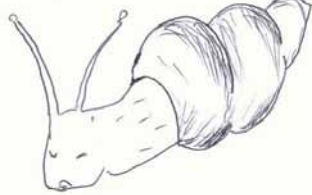
Methodology:

1. Explain the term 'habitat'. Discuss where we live and what we eat.
2. Then ask the children to think of an animal that needs the forest to live in.
3. Take a cut-out of that animal and show it to the class. Ask them to determine whether this animal is awake in the daytime or whether it is awake at night time (diurnal or nocturnal).
4. Divide the blackboard into two halves with a sun drawn on one half and a moon on the other. For each animal discussed, fix the cut-out on either side of the board using Sellotape® depending on whether the animal is diurnal or nocturnal.

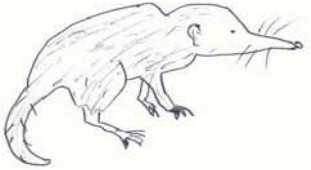
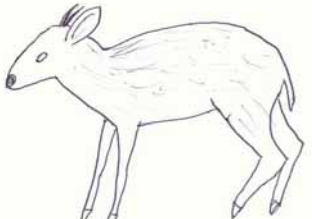
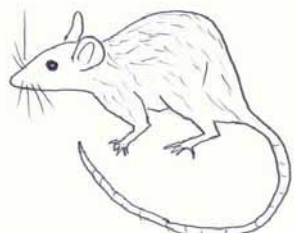
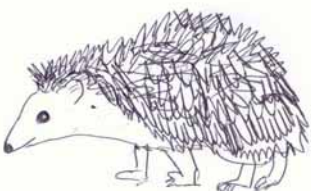
Extension:

5. Repeat exercise, but place animals according to habitat, e.g. in forest habitat or shamba habitat but writing these headings on the board.
6. Teach children about food chains by asking the children what an animal might eat and what might eat it. Arrange the cut-outs on the board in the form of a food web.
7. Encourage the children to imitate the noise of an animal or mimic the way that it moves etc. Ask the children to arrange the cut-outs themselves.

Pictures of Daytime Animals (diurnal)

		
Baboon	Butterfly	Cricket
		
Eagle	Snake	Frog
		
Colobus monkey	Hornbill	Person
		
Squirrel	Weaver bird	Skink
		
Blue monkey	Chameleon	Snail

Pictures of Nighttime Animals (nocturnal)

 Bat	 Shrew	 Honey badger
 Duiker	 Genet	 Tree hyrax
 Owl	 Mouse	 Bushbaby
 Bushpig	 Civet	 Hedgehog

6. Environmental Quiz

Read the following questions.

There are TWO wrong answers but only ONE correct one.

Decide which answer is the right one and circle either a, b or c using a pencil.

1. Why should we not wash our clothes directly into the rivers and streams?

- a) Because we like our clothes dirty.
- b) Because the soap we use will pollute the water.
- c) Because we don't like getting our hands wet.

2. What happens to a plastic bottle or bag if it is thrown on the ground?

- a) It turns into soil.
- b) It helps the plants to grow.
- c) It stays there forever.

3. What should we do with food waste?

- a) Bury it to make compost.
- b) Burn it to make a big bonfire.
- c) Throw it on the ground around the house.

4. How can we get wood for building without illegally destroying our forest reserves?

- a) By buying wood taken from another forest reserve further away.
- b) By planting tree nurseries in our village.
- c) By only taking wood from the middle of the forest reserve.

5. How do forest reserves regulate the weather?

- a) Without trees, the sun wouldn't shine.
- b) Trees stop it from snowing.
- c) Trees enable clouds to form, so that rain can fall.

6. What is bad about old batteries in the soil?

- a) Worms might trip over them.
- b) They make plants grow quicker than normal.
- c) They leak dangerous chemicals into the soil, poisoning crops and water supplies.

7. Why is it important to watch over fire in our farms carefully?

- a) Because it might burn out of control.
- b) Because it's nice to look at.
- c) Because we don't do it very often.

Which of the following answers is INCORRECT?
Out of the following answers FOUR are correct and just ONE is incorrect.
Circle the INCORRECT answer (either a, b, c, d or e) using a pencil.

8. Forest Reserves are important because:

- a) They are the source of most of our available water that we need every day.
- b) They are a home for unique plants and animals not found anywhere else in the world.
- c) They contain rare plants that we sometimes use for medicines and for traditional customs.
- d) They can be used by us to collect dead wood to use for our cooking.
- e) They can be used by us to cut down trees for carving and building and for hunting animals.

9. Why should we keep our homes and villages tidy and litter-free?

- a) To help prevent the spread of diseases.
- b) To make our village better at football.
- c) To reduce the number of rats and other vermin around our homes.
- d) To make us proud of our well-kept village.
- e) To improve the quality of our soils and streets.

10. Why is it important for us to protect our water systems?

- a) So that we have enough water to drink all year round.
- b) So that our cattle and goats have water to drink.
- c) So that other villages don't have any.
- d) So that we have clean water that makes us healthy.
- e) So that we can water our crops when it's dry.

A few questions that you could talk about at school...

• **How could you make your village litter-free?**

Perhaps you could place bins at school/other public places. Use bags made from natural fibres etc.

• **Where should you put non-recyclable rubbish like plastic items and old batteries?**

In a designated village pit well away from water supplies and farms.

• **Do you know how to plant a tree?**

It needs good soil and plenty of water to start it off.

• **How can we improve our clothes washing methods?**

We can take water away from the river in buckets and pour soapy water into the ground so that it does not contaminate our drinking water (or other villages' drinking water further downstream).

Answers

1 b, 2 c, 3 a, 4 b, 5 c, 6 c, 7 a, 8 e, 9 b, 10 c.

7. Play the 'Clean Water' Board Game

Age group: 12+

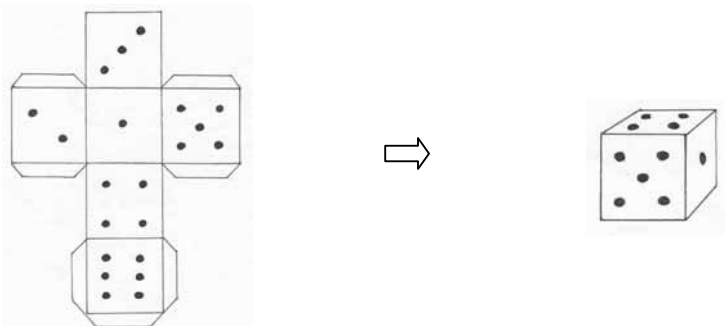
Aims: For children to think about issues that affect water quality and to reinforce in them the importance of keeping water sources clean.

Resources: Board game
one die
counters (e.g. stones, soda tops)

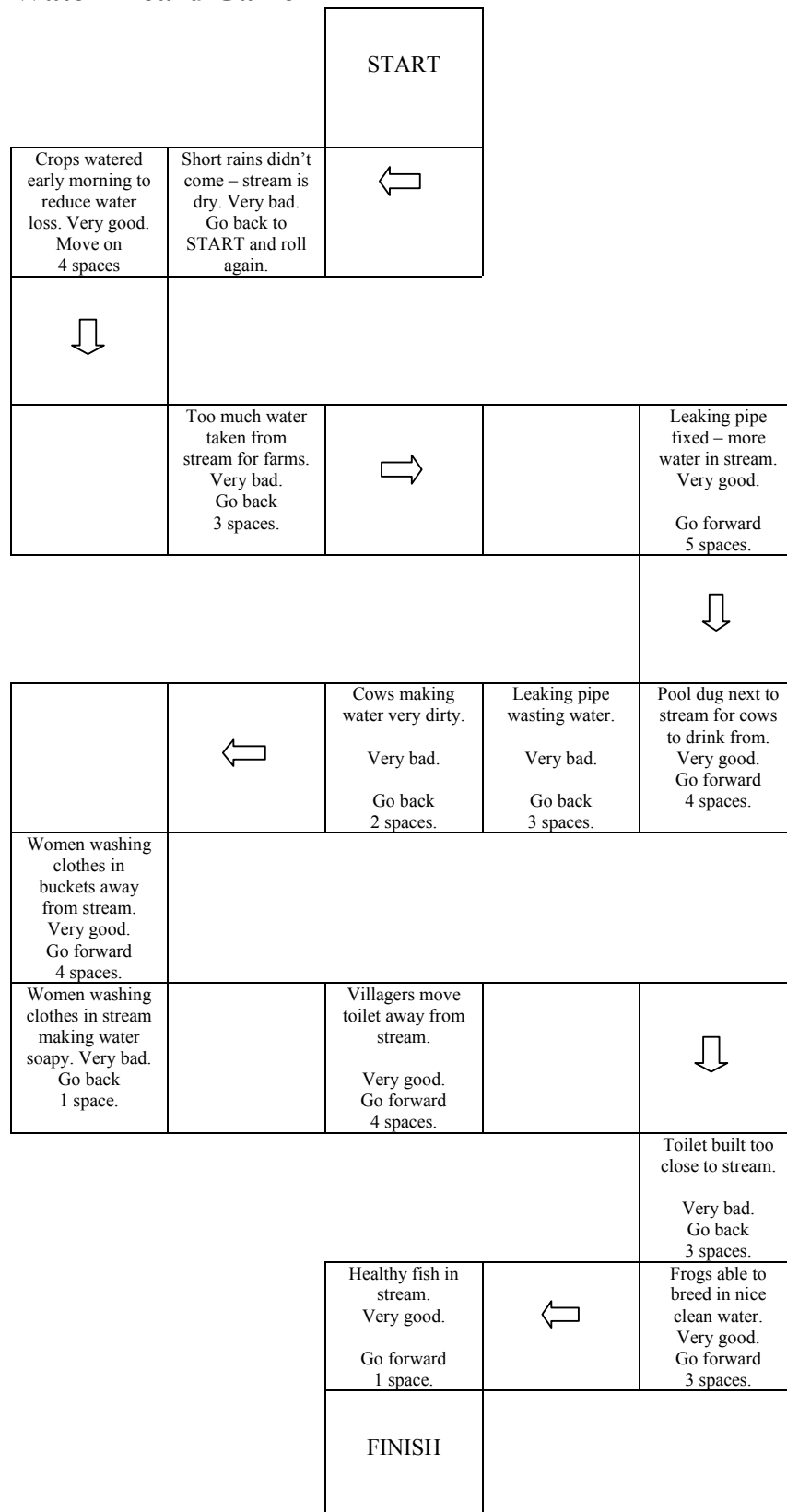
Methodology:

1. First discuss the need for clean water. Ask the children what we use water for (e.g. for us to drink, to cook with, wash with and also for our animals and crops).
2. Show them the board. The idea of the game is for children to learn about issues that damage water quality as well as ways that these issues can be avoided. The child encounters these issues as he/she moves down the board. The START position represents the 'upstream' water source, and the FINISH is the point 'downstream' where water is taken for use in the village.
3. Two or 3 players set their counters at the START.
4. The first player rolls the die and moves forward the number of squares as indicated by the die. If the player lands on a blank square, he is to stay there until his next go. If the player lands on a square with text, he is to read the text and move his counter forwards or backwards according to what is written, the player's go finishes when he lands on a blank square or passes the FINISH.
5. Each player takes it in turns to roll the die. The first player to reach or pass the FINISH is the winner.

To make a die, draw this template onto card, and cut around it. Fold all of the



straight lines and glue into a die shape.

‘Clean Water’ Board Game

8. Organise an ‘Environment Day’

Aims: For the school to have an active role to improve environmental awareness within the community.

Resources: Poster paper
Drawing pens etc.

Methodology:

Ideas for an Environment Day:

1. Choose a day in the calendar (perhaps to coincide with World Environment Week).
2. Have a brainstorming session to come up with ideas for the day. Some ideas that might work well are:
 - Compose and present an environmental song
 - Perform an environmental poem/rap
 - Produce a play highlighting environmental issues
 - Run a poster/storywriting competition
 - Invite a guest speaker
 - Tree planting



An example of a poster used to advertise an Environment Day

9. Using Factsheets

Aims: To improve knowledge of Forest Reserve biodiversity.

Objectives: To encourage reading skills: fluency, accuracy, intonation.
'Reading for meaning', being able to comprehend text and answer questions based upon it.

Resources: Factsheets
Paper
Writing and colouring pencils

Methodology:

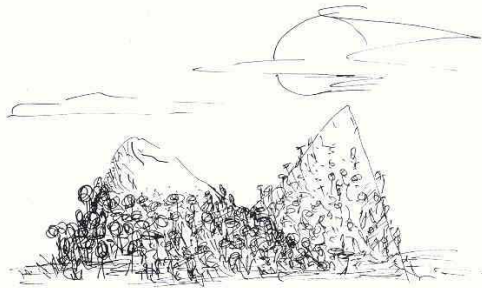
Suggested uses for the factsheets:

- Use factsheets for group readings and then ask questions on comprehension.
- Use sheets as a "springboard" for the children to produce their own factsheets on other animals.
- Ask the children to make up riddles based on the animals, ending in the question "What am I" (with perhaps a picture of the animal hidden underneath).

Extension: By complexity of factsheets and detail required.

Factsheets

FACTSHEET ONE Forest Reserve



What are they?

There are many Forest Reserves in the East Usambara mountains. Forest Reserves have been set up to try to protect water and wood resources as well as special plants and animals that live there.

How do you know where the Forest Reserve is?

Forest Reserves have a border which is kept clear of vegetation. Cement beacons mark the corners of the Forest Reserves. Two lines of trees are also planted to ensure everyone knows where the border is. In Mlinga Forest Reserve Teak trees with big leaves have been planted.

Who looks after the forest?

Catchment officers have the job of looking after the forest. They stop people illegally setting fires, cutting down trees and killing rare animals. They also put out fires and maintain the forest borders. They encourage people to use the forests in a sustainable way.

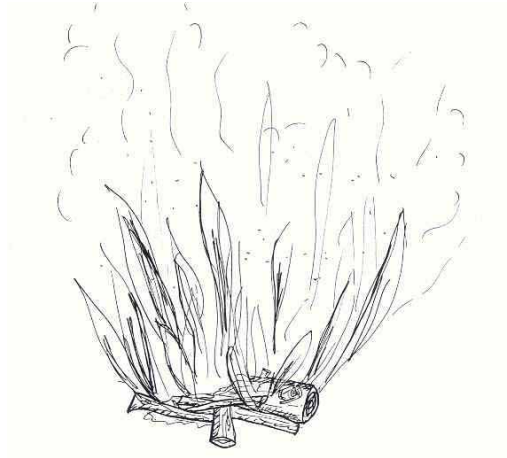
It is up to us all to help look after our forests. They are for everyone to enjoy and we want them to be around forever.

Other East Usambara Forest Reserves

There are many Forest Reserves in the East Usambara mountains and one Nature Reserve.

FACTSHEET TWO

Fire



What is it?

Fire is something we all use to cook our food on. It makes things very hot. Sometimes we use it to prepare shambas for the next planting period. If it gets out of control, it can be very dangerous.

What is a forest fire?

A forest fire happens if the ground is very dry. Sometimes people start fires in the forest by accident and these can spread. Because we cultivate close to the forest, the shamba fires can also spread into the forest by mistake.

Why is this bad?

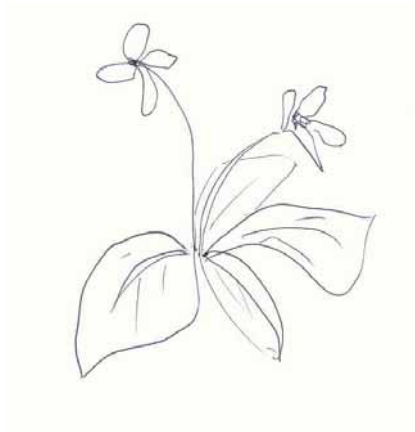
This is bad because when the forest burns it kills all the special plants and animals that rely on it. It also burns old wood that could be used for cooking wood.

What should we do if we see a forest fire?

When we see a forest fire, we should tell the Catchment Forest Officer so that he can arrange people to put it out. We should be proud of our special forest and make sure it is safe.

FACTSHEET THREE

Special Plants



The forest contains many unusual plants that aren't found anywhere else in the world. There are types of African Violets only found in the East Usambaras. These have pretty purple flowers.

People in other countries grow African Violets in pots in their houses because they think they are so nice.

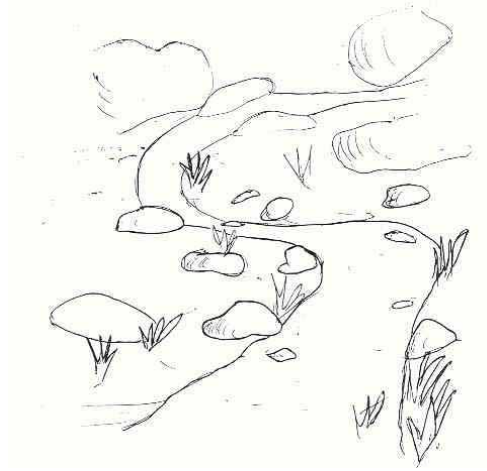
Some forest plants can be useful to us in many different ways. We use plants in medicines and to flavour foods. If we didn't have our forests, none of these special plants would be able to grow.

Can you think of some useful plants?

Try to write a list of all the plants that are used to help us.

FACTSHEET FOUR

Water



What is it?

Water falls as rain in the rainy seasons. It fills our rivers and helps us grow our crops. We need water to drink every day and we also use water to wash ourselves with, and for our animals to drink.

How do we look after it?

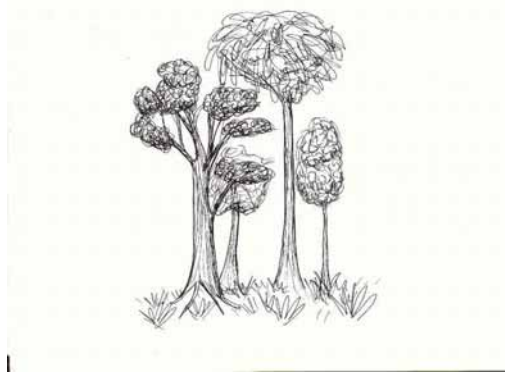
Water is precious. We must make sure we have clean water to drink otherwise we will get sick. We do this by not washing or making the water we drink dirty. Sometimes, not much rain falls in Tanzania so we have to look after the water supply that we have.

By looking after the trees in our forests, the rain will continue to fall regularly. Trees store water in their leaves, trunks and roots. Without trees the soil will be dry. Trees control the amount of rain that reaches the rivers.

Look out for the clouds full of water that sit over the forest on wet days!

FACTSHEET FIVE

Trees



What are they?

Trees are large plants that are found in the forest. People plant trees outside the forest too.

What do we need trees for?

We grow trees that produce fruits that we like to eat and we use trees for timber to build our houses.

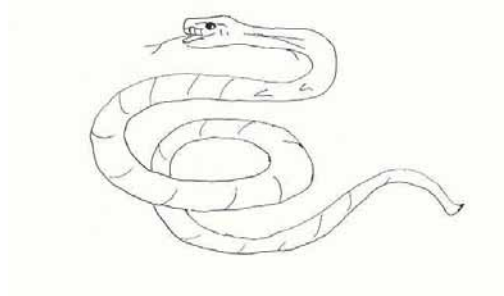
We can collect dead wood from the Forest Reserves but we are not allowed to cut down growing trees from the forest because they hold the soil together. They also help to make the air that we breathe and they regulate the rain. They also provide shelter for many smaller plants and forest animals.

What would happen if there were no trees?

If there were no trees, there would be no rain water to drink and no air to breathe. There would be no place for the special plants and animals that live in the forest to go either.

FACTSHEET SIX

Snakes



What are they?

Snakes are reptiles that live all over the world. Many snakes live in the forests in Africa. Some people don't like snakes because they can be dangerous as some are poisonous. Many however are not.

What should you do if you see one?

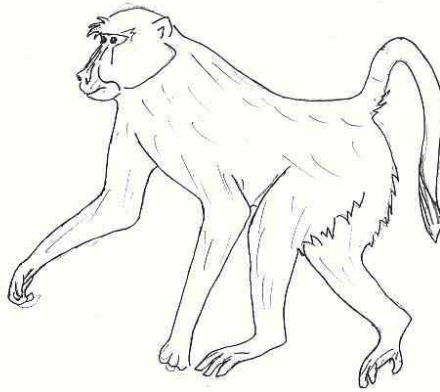
If you see a snake in the forest, you must leave it alone. They will not cause you any harm if you do not make them angry by annoying them. The best thing to do is not to approach snakes.

Special snakes

The East Usambara mountains have some special snakes that aren't found anywhere else in the world. In some areas people keep snakes as pets.

FACTSHEET SEVEN

Yellow baboon



How big am I?

I am a large monkey (65-98cm) from head to body. Males are larger than females.

Where do I live?

All over Tanzania. Mainly in woodland/forest but also dry bushland and coastal areas. I need rocks or trees for shelter. I need to live close to water and drink every day. Baboons are only found in Africa.

What do I eat?

Seeds, shoots, leaves and fruit. Also flowers, bulbs, pods, bark, roots and stems. My diet is mainly vegetable but I also eat insects, small reptiles and mammals, frogs, crabs and fish when available.

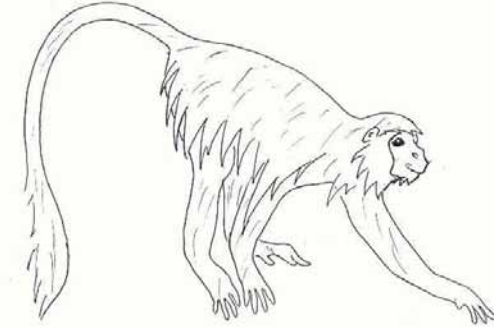
What noise do I make?

Other facts

I live in a family group called a 'troop' with lots of other baboons. The females rear the young while the males act as look-outs and protectors for the group.

FACTSHEET EIGHT

Colobus monkey



What am I?

I am a Pied Colobus monkey.

How big am I?

I am a medium size monkey (60-75cm) head and body. Smaller than baboons.

Where do I live?

I live in a range of forest habitats but I must have trees to live in, if I don't I will die.

What do I eat?

Mainly leaves, fruit and seeds but also bark, palm-nuts and insects.

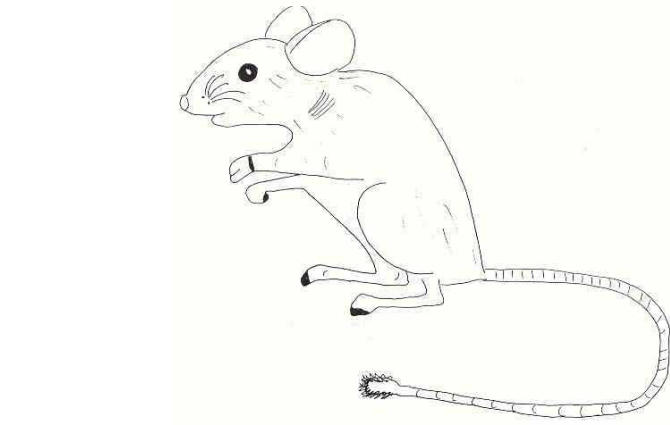
What noise do I make?

Other facts

I live in a group called a 'troop'. We stay in the forest or woodland and do not cross open ground readily. This means we are 'forest-dependant' and need the forests to survive.

FACTSHEET NINE

African woodmouse



What am I?

I am an African woodmouse

How big am I?

I am very small. My head and body are about 10cm long and my tail is up to 13cm long.

Where do I live?

I live in the forest. I make my nest out of dry leaves in holes in trees.

What do I eat?

I eat seeds, leaves and shoots and sometimes insects. I eat fruit I find in the forest.

When am I awake?

I am awake only at night and I sleep during the day.

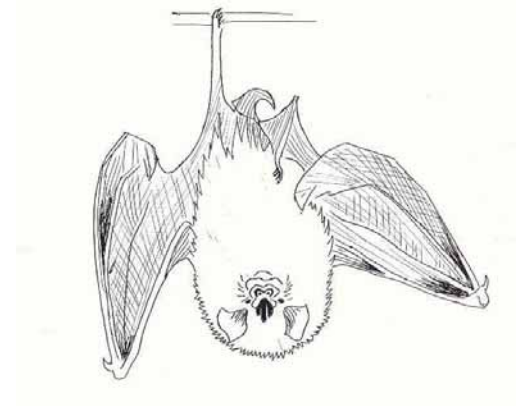
What noise do I make?

Other facts

When I give birth, I have between one and five baby mice which are hairless, pink and blind. These babies grow very quickly and leave the mother four weeks after birth.

FACTSHEET TEN

Leaf nosed bat



What am I?

I am a leaf nosed bat

Where do I live?

I live in forest and woodland areas all over Africa, but not in the Sahara Desert. I live in hollow trees, caves and buildings.

What do I eat?

I eat insects, flying termites and ant-swarms.

When can I be seen?

I am only seen flying at nighttime when I am awake, especially at dusk and at dawn.

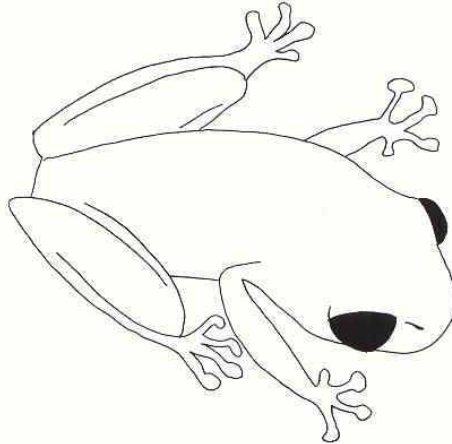
What sound do I make?

Other facts

I make sounds using my large nose, not my mouth. These sounds help me to not bump into things in the dark. I am not a bird, I am a mammal (like a mouse is).

FACTSHEET ELEVEN

Usambara tree frog



What am I?

I am an Usambara tree frog. There are many different types of tree frog, some of us are only found in the Eastern Arc Mountains in Tanzania. This makes us very special.

Where do I live?

As my name suggests, I live in trees. I depend on the forest to survive. I also need water to live and lay my eggs.

What do I look like?

I am a large frog (up to 8.5cm long) and I am a greeny blue colour. I am only found in the Usambara mountains.

What do I sound like?

Why is the forest so important to us?

We are only found in the forests of the Eastern Arc Mountains, such as Mlinga Forest Reserve. We would die out if the forest was destroyed.

FACTSHEET TWELVE

Usambara Eagle Owl



What am I?

I am an Usambara Eagle Owl

Where do I live?

As my name suggests, I am only found in the forests of the Usambara mountains. This means I depend on the forest for survival.

When am I awake?

I come out at night to hunt. You will not be able to see me during the day because I will be asleep in a tree-hole.

What do I look like?

I am a beautiful bird with red/brown wings and a creamy belly.

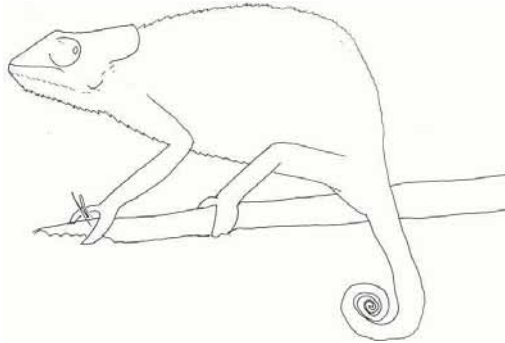
What do I sound like?

Why is the forest important to me?

Because I am only found in the Usambaras, I rely on these forests to live. If the forest was destroyed I would have nowhere to live.

FACTSHEET THIRTEEN

Chameleon



What am I?

I am a flap-necked chameleon.

Where am I found?

I live in the forests of Eastern and Southern Africa, including the Usambara Mountains.

What do I eat?

I like many different types of insects: crickets, grasshoppers, flies, spiders and moths.

What do I look like?

I am bright green and grow up to 38cm long. I have a large flap over the back of my neck which I can spread out like an elephant flapping its ears. This is a warning to animals that might want to eat me.

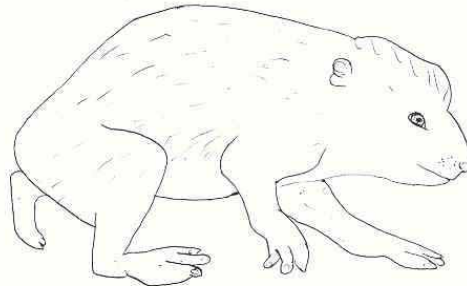
Other facts

I can turn my eyes all around. This helps me see danger and predators quickly.

Unlike some other chameleons I lay eggs. When I hatched, my tail was as long as my body.

FACTSHEET FOURTEEN

Tree hyrax



What am I?

I am an Eastern tree hyrax. I am a small furry animal with no tail.

How big am I?

I am medium-sized, between 30-60cm long.

Where do I live?

I live in forest and woodland areas of Tanzania. I spend most of my time in the tops of trees, and sometimes I sleep there too.

When am I awake?

I am active during the night and am not seen during the day.

What do I eat?

I eat leaves, fruit and twigs in the canopy of trees. Sometimes I will eat leaves and herbs on the ground too.

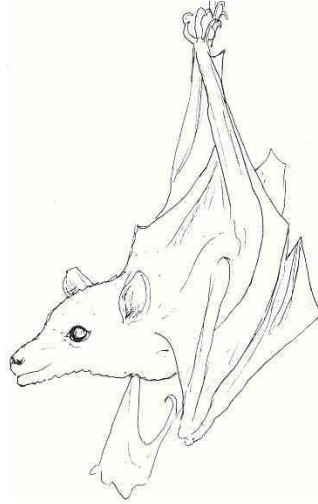
What sound do I make?

Why is the forest important to me?

The Eastern tree hyrax is only found in the Usambaras, Pare Mountains and Uluguru Mountains. We rely on these forests to survive.

FACTSHEET FIFTEEN

Fruit bat



What am I?

I am a fruit bat. I have large brown eyes and funnel-shaped ears.

Where do I live?

I am found throughout Africa and also in Asia and Australia. I live in a big group and we sleep together in caves or trees.

When am I awake?

I wake up at nighttime. I can be seen flying or feeding at dusk.

What do I eat?

I eat fruit, nectar and flowers in trees.

What sound do I make?

Other facts

There are many types of fruit bat living in this part of Tanzania. We rely on forests for trees to sleep in and feed from.

NYENZO ZA MAFUNZO MASHULENI

Nyenzo kwa Shule za Msingi

**Shughuli za Kuhimiza Ufahamu wa Mazingira ya
Misitu ya Hifadhi**



**Oliver, S.A., Fanning, E., Hall, S. and
Muruke, M. (eds.)**

**UTAFITI WA BIOANUWAI USAMBARA MASHARIKI
PROGRAMU YA ELIMU YA MAZINGIRA**

**Frontier-Tanzania na EUCAMP
March 2002**

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DIBAJI

Nyenzo hizi za mafunzo zimeandaliwa kutokana na ziara za Elimu ya Mazingira zilizofanyika shule ya Misingi Misozwe, Usambara ya Mashariki. Uandishi wa nyenzo hizi ulitiwa msukumo na shauku na matakwa ya walimu kutaka kuendeleza pale tulipokomea. Nyenzo hizi zinamaelezo ya masomo ambayo Frontier-Tanzania imeyatoa kwa msaada wa maafisa misitu, na pia kuna nyongeza ya mawazo ya shughuli zinazoweza kufanyika kwa ajili ya walimu. Lengo kubwa la nyenzo hizi ni kuwa zaweza kutumika na walimu wa shule nyingine katika kukuza mapenzi ya wanafunzi wao kwa misitu ya hifadhi na kwa mazingira ya asili.

SHUKURANI

Shukurani kwa walimu na wanafunzi wa shule ya Msingi Misozwe kwa ushiriki wao na nguvu zao wakati wa ziara yetu. Asante wafanyakazi wa kudumu na wakujitolea wa Frontier-Tanzania waliosaidia katika programu ya Elimu na hasa kwa Jane Wheeler ambaye uzoefu wake wa kufundisha ulikuwa faida kubwa katika mradi. Asante ma-Afisa Msitu wa Usambara Mashariki, na hasa Johari Mtango, Francis Kondo, Selemani Hamadi na Albert Ntemi, ambao walikuwa muhimu kwa ufanikishaji wa mradi, na kwa Kenneth Danga kwa ustadi wake kutafsiri Kingereza-Kiswahili.

Vielelezo vyote katika Nyenzo hizi vimechorwa na S.A. Oliver isipokuwa baadhi ya michoro ya maelezo halisi ambayo ilichorwa na wafanyakazi wa kujitolea wa Frontier Tanzania. Vitabu muhimu vya kizoolojia kuhusu wanyama wa milima ya Usambara Mashariki ambavyo baadhi vilitumika kusaidia habari za wanyama na michoro ni kama vifuatavyo:

Kingdon, J (1997); *The Kingdon Field Guide to African Mammals*; Academic Press, London, U.K.

Spawls S., Howell K., Drewes R., J. Ashe (2002), *A Field Guide to the Reptiles of East Africa*; Academic Press, Hong Kong.

Walker, C. (1996), *Signs of the Wild*; Struik, S.Africa.

Zimmerman D.A., Turner D.A. and D.J. Pearson (1999); *Birds of Kenya and Northern Tanzania*; Christopher Helm (Publishers) Ltd., London, U.K.

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CHIMBUKO

Tangu Julai 1995 Frontier-Tanzania (kwa ushirikiano kati ya Chuo Kikuu cha Dar es Salaam na Jumuiya ya Uchunguzi wa Mazingira) imefanya kazi na Programu ya Kuhifadhi Mazingira Usambara Mashariki (EUCAMP) kutafiti bioanuwai katika Misitu yote ya Hifadhi ya Usambara Mashariki. Mradi wa Utafiti wa Bioanuwai Usambara Mashariki (EUBS) unatekelezwa na Idara ya Misitu na Nyuki ya Wizara ya Maliasili na Utalii kwa msaada wa kifedha kutoka serikali ya Ufilipino, na msaada wa kitaalamu kutoka Metsähallitus Consulting.

Ushirikishwaji wa jamii ya wenyeji katika utunzaji wa misitu umekuwa ukihimizwa na serikali ya Tanzania kwa kupitia utekelezaji wa sera yake ya misitu ya hivi karibuni kabisa (1998). Katika kifungu cha ‘Utunzaji wa Mfumo wa Ikolojia’, sera hii inajadili mategemeo mbalimbali ya mbeleni, matatu kati yake yakijumuisha uthaminiaji na ufahamu mkubwa wa thamani za bioanuwai, ushirikishaji wa sekta binafsi na jamii za wenyeji katika uhifadhi wa bioanuwai, na kupeleka elimu kwa jamii za wenyeji.

Wakati wa shughuli za hapo nyuma za EUBS, ilikuwa wazi kwamba jamii za wenyeji zilifurahia sana kushirikishwa, na kujifunza zaidi juu ya bioanuwai katika misitu yao ya hifadhi. Pote Tanzania na kote katika nchi zinazoendelea, taarifa zilizopatikana katika tafiti za kisayansi zilikuwa haziwafikii wanavijiji wenyeji na hata mashuleni.

Oktoba 2001 Hadidi mpya za Rejea zilitiwa saina na Frontier-Tanzania na EUCAMP kumalizia utafiti katika misitu mitano ya hifadhi iliyobakia, Mlinga, Mgambo, Bombo Mashariki I na II, na Derema (ilipendekezwa). Lengo moja liliongezwa katika hadidi za rejea kukamilisha hoja. Lengo hili lilisema timu ya EUBS ‘itatoa taarifa za ugunduzi wake kupitia elimu ya mazingira katika mtandao wa shule na kamati za vijiji, kwa kushirikiana na Programu ya Misitu Vijijini ya EUCAMP.’

Lengo hili lilitokelezwa mara ya kwanza katika Msitu wa Hifadhi Mlinga. Uzoefu uliopatikana umehifadhiwa kama Taarifa ya Kitaalamu ya EUCAMP. Hii ‘Nyenzo za Mafunzo Mashuleni’ ni sehemu ya hii taarifa, na matunda ya kazi ngumu na kujituma kwa kikundi kidogo cha wafanyakazi wa Frontier-Tanzania, watafiti wasaidizi, wafanyakazi wa uwandani, maafisa misitu na maafisa misitu wasaidizi. Tunamatumaini kwamba hati hii itatumika kama njia kwa walimu mashuleni, kusaidia kuongeza ufahamu juu ya mazingira yao yanayowazunguka.

Susannah Hall
Mratibu wa Utafiti

MADHUMUNI YA NYENZO ZA MAFUNZO

Mpango: Kuongeza upendo, heshima na hisia za uwajibikaji kwa misitu ya hifadhi katika milima ya Usambara Mashariki.

Makusudio:

- 1.Kukuza jukumu binafsi katika kulinda na kutumia msitu wa hifadhi.
- 2.Kuchochea heshima na upendo kwa mazingira ya misitu asilia.
- 3.Kuongeza uelewa wa jukumu la Bwana Miti (Catchment Officer).

Malengo:

- 1.Kukuza ufahamu kwamba msitu ni muhimu.
- 2.Kukuza ufahamu kwamba msitu unahitaji matunzo.
- 3.Kukuza ufahamu kwamba msitu ni ‘wako’ kuenzi.

1. UTANGULIZI KUHUSU MILIMA YA USAMBARA MASHARIKI

Authors: Oliver, S.A. Pp. 59-60.

Milima ya Usambara Mashariki ni sehemu ya Safu ya Milima ya Ukanda wa Mashariki. Safu hii ya Mashariki ipo sanasana Tanzania na kidogo kusini mwa Kenya. Maeneo yaliyomo ni pamoja na, Milima ya Taita (Kenya), Pare, Usambara, Nguru, Uluguru, Ukaguru, Rubeko, Udzungwa, Mahenge na Milima ya Matengo.

Milima ya Usambara Mashariki ni muhimu kwani ni mwinuko mkubwa unaosababisha kunyesha kwa mvua kutokana na kufanyika kwa mawingu katika Bahari ya Hindi; mara nyingi mvua hufikia kama mm 2000 kwa mwaka. Kila mara watu hudhani kwamba Mlima Kilimanjaro ni sehemu ya milima hii lakini, kwa uhakika, Kilimanjaro ni wa ‘karibuni’ sana ukilinganisha na Milima ya Safu ya Mashariki. Safu ya Mashariki imefanyika zaidi ya miaka milioni 30 iliyopita, wakati Mlima Kilimanjaro umefanyika miaka milioni 1 tu iliyopita.

Milima ya Usambara Mashariki, na mengine iliyo katika Safu ya Mashariki ni misitu iliyoachana achana sana. Ina kiasi kikubwa cha wanyama na mimea adimu na isiyo ya kawaida isiyopatikana pengine popote duniani (Wanyama na Mimea inayopatikana katika eneo moja tu kama hii hujulikana kama ‘endemic’).

Baadhi ya mimea na wanyama maalum wanaopatikana Safu ya Mashariki pekee imeorodheshwa hapa chini:

Dughulishi (African violet)	Bundi (Usambara eagle owl)
Blackwood	Swynnerton’s robin
Komba (Zanzibar galago)	Kinyonga (Usambara three horned Chameleon)
Mbega Mwekundu	Usambara dwarf gecko
Njule (Zanj elephant shrew)	Vyura wa Majini (Usambara torrent frog)
Pelele (Eastern tree hyrax)	Vyura wa majani makavu (Dead leaf toad)

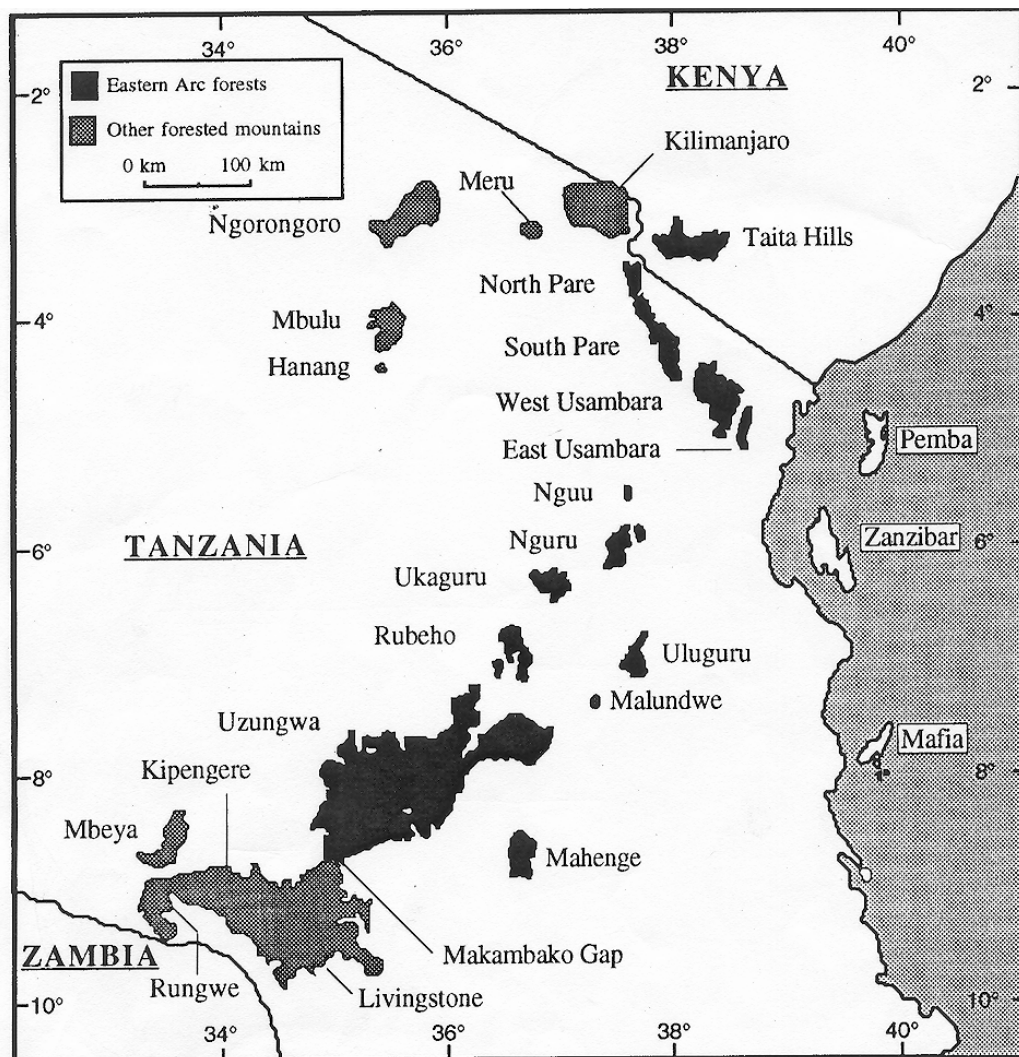
Masharika kama World-wide Fund for Nature (WWF), Birdlife International na the International Union for the Conservation of Nature and Natural Resources (IUCN) yote yamelipa kipaumbele eneo hili katika uhifadhi.

Eneo hili wakati wa nyuma lilikubwa sana na ukataji mkubwa wa magogo na ufyekaji wa misitu kwa ajili ya mashamba ya chai, mkonge, misonobari, na miwato (mengi yakiwa yameanzishwa na waingereza na wajerumani kabla ya uhuru). Hii ilipelekea mmomonyoko wa udongo kufuatia maeneo yaliyofyekwa misitu kufanywa maeneo ya kilimo cha mazao.

Milima ya Usambara Mashariki iko katika hatari kwani imepoteza 70% ya uoto wake wa asili katika miaka 50 iliyopita. Kuna mbanano mkubwa sana (takwimu?) (kwa uchumi unaotegemea kilimo). Kunakinga kutoka Divisheni ya Misitu na mpango wa uhifadhi wa misitu kwa jamii husika unaanzishwa.

(Taarifa zimepatikana kutoka: Mittermeier R. A. *et al* (1999), Hotspots, Earth’s Biologically Richest and Most Endangered Terrestrial Ecoregions. Toppan Printing Co. Japan.)

Ramani ya Milima ya Usambara Mashariki, ndani ya Safu ya Milima ya Mashariki.



Maeneo ya msitu wa Milima ya Ukanda wa Mashariki

Ramani imechukuliwa toka: J.A. Isango (2001), A Partially Annotated Bibliography of Biodiversity Studies in the Eastern Arc Mountains, Tanzania Forestry Research Institute (TAFORI).

2. ANDALIO LA SOMO

Authors: Oliver, S.A., Hall, S., Wheeler, J., Ntemi, A.S. & Mtango, J. Pp. 61-72.

1. Kazi za Bwana Miti

Lengo: Kuongeza ufahamu jinsi bwana miti anavyofanyakazi kusaidia kutunza misitu yao.

Makusudio:

1. Kufanya majadiliano kuhusu maana ya msitu wa hifadhi.
2. Kujua kwanini ni muhimu kwa jamii.
3. Kuonyesha kuwa msitu ni mali ya nani.
4. Kuona je, nini kingetokea endapo msitu usinge angaliwa, usinge tunzwa na usinge lindwa (hasa na Bwana miti).

Vifaa: Ubao wa kuandikia, ramaini ya Usambara yenye kuonyesha misitu, kalamu na ikiwezekana kitalu cha miti.

Njia:

1. Kuelezea Bwana miti ni nani?
2. Anafanya kazi wapi?
3. Kujua, je kuna mtu yeyote anayefahamu kwa nini misitu ya hifadhi ni muhimu?
4. Aidha kueleza ni watu gani ambao Bwana miti anashirikiana nao kufanya kazi.
5. Kuwapa wanafunzi muda wa maswali na majibu.

Hifadhi ya misitu

Mapendekezo juu ya Maongezi ya Afisa Misitu

Lengo: Kuongeza kiwango cha hisia kwa wanafunzi kupenda, kuheshimu na hisia za uwajibikaji wa wanafunzi juu ya mazingira hasa misitu ya hifadhi iliyo karibu nao.

Maswali ya msingi:

Msitu wa hifadhi ni nini?
Umuhimu wake ni nini?
Msitu wa hifadhi ni mali ya nani?
Nani anawajibika kwa utunzaji?
Bila ya misitu tungekuwa wapi?

Maongezi juu ya Bwana Misitu:

Bwana Misitu ni nani?

“Anafanya kazi na wananchi ili kuwawezesha kutumia/kunufaika na misitu ya hifadhi kwa njia ambazo hazitaleta uharibifu”

“Wapo watendaji wengine kama yeye katika misitu yote ya Usambara mashariki. Serikali ilianzisha usimamizi huu kwa vile inafahamu umuhimu wa misitu kwa wananchi wake.

Misitu ya hifadhi ni nini?

Haya ni maeneo muhimu kwa sababu.

Ni maeneo ya vyanzo vya maji kwa maeneo yaliyo karibu.

Kuni kwa ajili ya nishati hupatikana humo. Serikali inafahamu umuhimu wa maeneo haya, hivyo kuamua kuyatunza na kuyalinda.

Kazi ya afisa misitu ni nini?

Kuwahamasisha wananchi waishio karibu na misitu ya hifadhi (mfano msitu wa Mlinga) kuulinda na kuutunza kwa dhati, husaidiana na kamati za mazingira za vijiji na vikundi vingine kuwaelimisha wananchi juu ya matumizi mazuri ya misitu yetu.

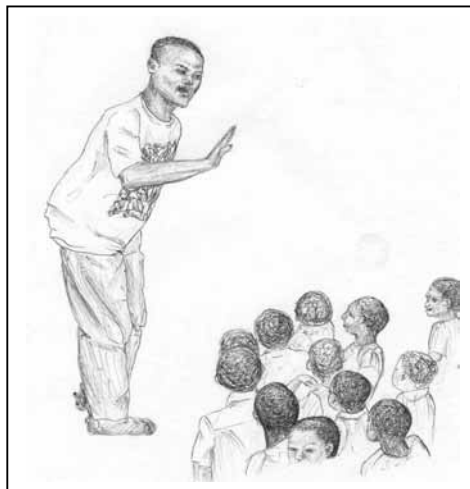
Misitu ya hifadhi ni “mali ya asili” tuitumiayo, lakini hatuna budi kuitumia kwa uangalifu mkubwa ili tuweze kuifaidi kwa miaka mingi.

Kazi nyingine ambazo afisa misitu anazifanya

1. *Uanzishaji wa vitalu vya miti.* Hii ni moja ya njia muhimu ya kupunguza ukataji miti ovyo katika misitu ya hifadhi kwa ajili ya ujenzi. Kazi ya kutengeneza vitalu vya miti ni muhimu kwa sababu tunajifunza jinsi ya kuotesha mbegu za miti, utunzaji wa miti ambayo baadaye tunaitumia, pamoja na kuuza ili kupata fedha kwa ajili ya shule yetu.
2. *Uanzishaji wa bustani za mboga,* katika vijiji. Ulimaji wa mboga mboga unasaidia ili kupunguza kutegemea uvunaji wa majani ya mboga kutoka msituni. Faida yake mboga mboga hizo tunatumia na nyingine kuuza.
3. *Kuelekeza matumizi mazuri ya moto* ambao hauwezi kuleta madhara kwenye misitu pale unapotumika. Wananchi wanao wajibu wa kutoa taarifa kwa kamati

za mazingira za vijiji kabla ya kuchoma moto katika mashamba yao, vinginevyo hatua za kisheria zitachukuliwa dhidi yao. Vilevile afisa misitu aelekeza namna ya kusafisha shamba kabla ya kuchoma moto na jinsi ya kuchunga moto unapotumika mashambani usienee katika misitu ya hifadhi.

4. *Kuzuia uwindaji haramu.* Aina yoyote ya uwindaji (au uvunaji wa mali asili isipokuwa kuokota kuni kavu) ni kinyume na sheria za misitu za Tanzania. Mtu yeyote anayekamatwa kwa makosa hayo anahukumiwa kulingana na sheria za nchi. Wawindaji mara nyingi wamekuwa ndio chanzo cha moto misituni kwa vile huchoma moto kwa nia ya kuwaua wanyama, ambapo baadaye huacha moto huo kuendelea kuwaka na kuchoma msitu. Msitu unaungua haraka sana hasa nyakati za ukame (kiangazi) na kusababisha mali hai nyingi hasa wanyama na mimea adimu kuungua moto.
5. *Utengenezaji na utumiaji majiko sanifu.* Sisi wote lazima tukubali kwamba tunatumia kuni nyingi sana kupikia vyakula vyetu. Afisa misitu husaidai kuhamasisha wananchi kutumia majiko yanayotengenezwa kwa udongo wa mfinyanzi yanayo tumia kuni kidogo sana kulinganisha na jiko la mafaiga matatu. Hii ni hatua kubwa sana ya kuokoa misitu yetu. Ni majiko ambayo kila mtu anaweza kutengenezea. Je kila mmoja wenu wanalo nyumbani kwenu.
6. *Kuhimiza ufugaji wa nyuki ki-vikundi* katika vijiji, kwa mfano wanavijiji wanaweza kufuga nyuki na kugawana asali na ziada kuuza na kujipatia fedha.
7. *Kuhimiza ufugaji wa samaki* kwa kuchimba mabwawa madogo madogo ya kifamilia. Hii itasaidia kuondoa tatizo la uwindaji haramu kwa ajili ya kitoweo. Ufugaji wa samaki umeanza kuenea sana katika eneo la Magoroto ambako hupatikana maji kwa urahisi.



Afisa Misitu akifundisha wanafunzi juu ya Misitu ya Hifadhi

2. Uchunguzi wa Mazingira

Mkazo: 1. Sayansi/Jiografia
2. Jiografia (Upanuzi wa somo)

Umri drs: 6+ **Muda dk:** 30

Kusudi: Kuongeza ufahamu wa mazingira wanamoishi wanafunzi wanamoishi.

Lengo: 1. Kuchunguza bioanuwai katika maeneo ya shule mfano, alama zi nazoonyesho kuwepo wanyama, mimea, miti, wadudu na vipepeo kwa kuangalia ardhini.
2. Kuwa na uwezo wa kuviwakilisha kijiografia vitu vilivyo kwenye mazingira.

Vifaa: Karatasi isiyo na mistari
'Wax crayons'
Penseli
Kionambali, chandarua za vipepeo, lensi ya kukuzia, chombo chenye vitu vya mazingira, compassi na vinasa sauti*
(*si lazima)

Njia:

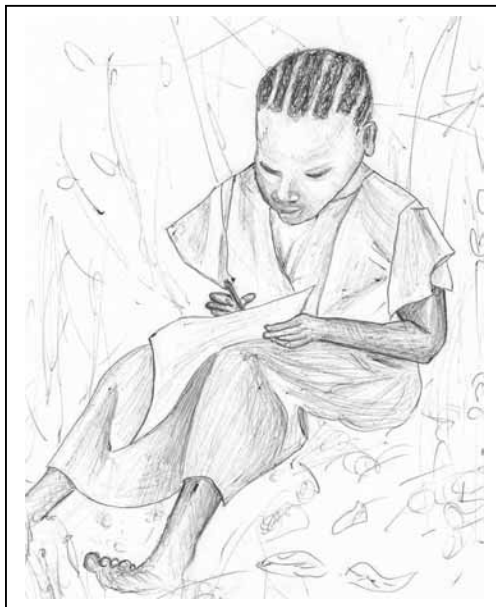
1. Baada ya kuchagua eneo katika mazingira ya shule wanafunzi wataulizwa wanaelewa nini maana ya neno 'mazingira'. (Yaweza kufanyika kama utangulizi wa somo au mwisho ni, kuona kama wanafunzi wameielewa maana) dk 5.
2. Baada ya kueleweka kuwa ni "eneo linalotuzunguka" wanafunzi wataombwa kutafuta viumbe hai katika mazingira ya shule au alama ya vitu hai vilivyokuwepo. Ni muhimu kuangalia ufanikishaji wa zoezi hili pasipo kuharibu mazingira. dk 5.
3. Gawa vifaa vya kuchorea na onyesha nyenzo nyingine yoyote.
4. Wagawe wanafunzi katika makundi madogomadogo, wakati wa kuangalia alama, kama viota vya ndege, majani/magome ya miti, maua ndege, vipepeo, wadudu. Tafuta vitu vingi iwezekauavyo kwa dk 20.
5. Kusanyikeni tena kujadili vilivyopatikana. Toa maoni juu ya matokeo.

Nyongeza/upanuzi wa somo:

6. Darasani, chora ramaniya shule, na onyehsa wapi viumbe hai vimepatikana. Kwa wanafunzi wakubwa panua hadi kuonyesha kijiji, mito, na msitu wa hifadhi.
7. Sikiliza sauti, rekodi na tambua sauti.
8. Tumia vifaa vya kitaalamu zaidi katika kupima miti, kukusanya wadudu n.k.
9. Ingiza maneno ya kitaalamu zaidi katika uchunguzi wa Mazingira mfano, viumbe wasio na uti wa mgongo/wenye uti wa mgongo.
10. Badili msisitizo wa uchunguzi toka alama za vitu asilia kuangalia alama za matumizi/madhara yanayoletwa nabinadamu katika mazingira. Mifano ya madhara inaweza kujumuisha uchomaji moto, ulimaji, mabomba ya maji, matanuri ya matofali, ulishaji mifugo, matumizi ya miti kwa dawa. Hii inaweza kupelekea mjadala juu ya uwajibikaji katika mazingira mrudipo darasani.

Tathmini:

Itokane na mawazo ya wanafunzi na uelewa wa neno ‘mazingira’ na itokane na kazi za wanafunzi. Pia maoni ya walimu na yako binafsi.



Mwanafunzi akiandika vitu alivyoona katika Uchunguzi wake wa Mazingira

3. Kuhisi Kuna Nini Ndani ya Mfuko?

Mkazo: Sayansi/Lugha

Umri drs: 6+

Muda dk: 30

Shabaha: Kuongeza ufahamu wa kujua aina mbalimbali za viumbe hai waliomo ndani ya hifadhi ya msitu.

Malengo: 1. Kusaidia utambuzi wa viumbehai
2. Kuongeza matumizi ya lugha ya kujieleza.

Vifaa: Mifuko/makapu yenye vitu; mawili katika kundi la watu wapatao 10. Vitu/maliasili zilizopatikana msituni, manyoya ya ndege, matunda yenye mbegu ndani, mbegu, viota vya ndege, nywele, sufi, majani ya miwato n.k.

Njia:

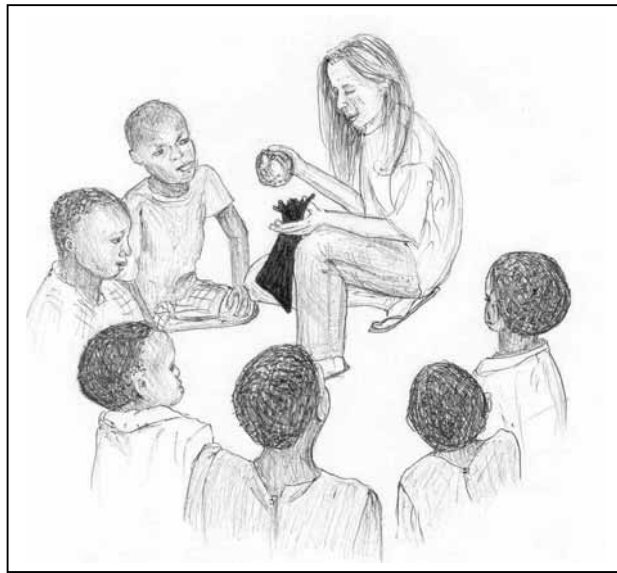
1. Itaelezwa kuwa kuna vitu ndani ya mifuko/makapu kutoka msituni. Wanafunzi watakaa katika makundi yenye wastani wa watu 10 katika mduara na mfuko/kapu litapitishwa kuzunguka.
2. Pasipo kuchungulia, wanafunzi wataingiza mikono ndani ya kapu na watalinsi kilichopo. Watatakiwa kusema neno moja kuelezea kuna vitu gani, kila mara lazima liwe neno tofauti na la kwanza.
3. Kisha vitu vitafunuliwa polepole kuonyesha kama walikuwa sahihi.

Upanuzi/Nyongeza:

Sauti zinaweza kupigwa katika radio na kisha watoto/wanafunzi wakachora aina ya wanyama watakaoweza kusikia kwa. dk 5. Baadae sauti zitapigwa tena na kutoa maelezo kila sauti ikisikika (kwa kuandika/kuchora ubaoni ili kufafanua).

Tathmini:

Kukaza uwezo wa wanafunzi wa kubuni na kuongezeka kwa ujuzi.



Mfanyakazi wa kujitolea akionyesha ‘nini kimo kapuni’ kwa kundi la watoto.

4. Kitabu cha Kundi Kuandika Hadithi

“Siku Moja Nilikwenda Msituni na Niliona...”

- Mkazo:**
1. Ufahamu wa Mazingira
 2. Lugha
 - 3 Uchoraji

Madhumuni:

Kusisitiza umuhimu wa misitu katika maisha ya kila siku katika eneo husika, na Umuhimu wa wenyeji katika utunzaji wa mazingira. Kuonyesha uwiano wa maisha ya viumbe hai katika misitu.

Makusudi:

1. Kufikiria hadithi iliyotengenezwa vizuri yenye mwanzo, ukati na mwisho unaoeleweka.
2. Kwa kutumia misamiati na misemo inayotambulika.
3. Kujadili matatizo yanayoathiri misitu.
4. Kujadili jinsi ya kutunza misitu.

Vifaa:

Matangazo/mabango anayotumia Bwana miti yanaweza kutumika kama kikumbushio. Ubao na chaki, (ubao mweupe), kipande cha karatasi chenye matangazo.

Mbinu/Njia:

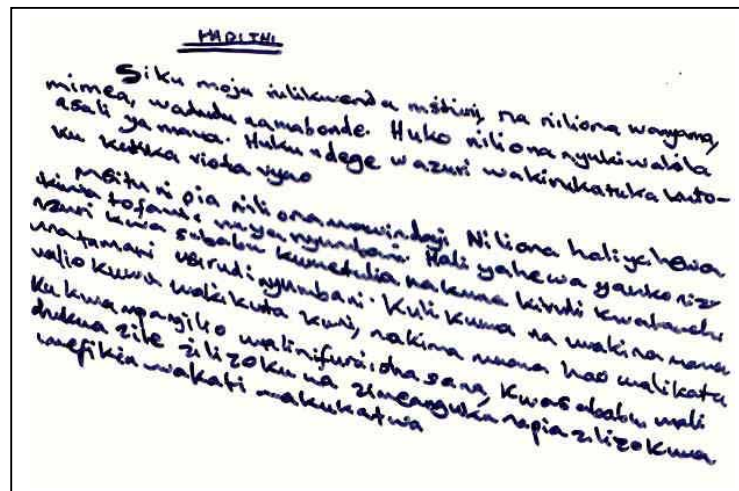
1. Watoto wataulizwa ni wanyama gani wanategemea kuwaona msituni, watu wanaweza kuutumia vipi msitu na nini kinaweza kuudhuru msitu. Mawazo yao yataandikwa/yataorodheshwa ubaoni.
2. Baadae itaelezwa kuwa wataandika hadithi ya pamoja. Mwalimu atanzisha hadithi kwa kuandika ubaoni “siku moja, nilikwenda msituni na niliona...” na kuuliza mtoto mmoja kuchangia mstari unaofuata, kwa mfano kwa kutumia mnyama. Mapendekezo jinsi ya kuelezea kilichoonekana yataombwa kuifanya hadithi iendelee.
3. Sentensi zitaandikwa ubaoni (na mwandishi ataandika hadithi jinsi inavyoundwa katika kitabu cha darasa). Kimantiki baada ya kuanza, kutakuwa na maelezo ya kujenga mandhari. Baadaye, jinsi hadithi inavyoendelea kuundwa shughuli za kati za hadithi zitamalizika (kwa uzuri au ubaya) mwishoni mwa hadithi.
4. Kwa watoto wakubwa (madarasa ya juu). Ukati wa hadithi utakuwa kama sentensi 10 na kumalizia kwa ‘ujumbe’.

Mwendelezo wa Somo:

5. Inawezekana mtindo huu kutumika na watoto wadogo pia. Hadithi ya mfano itasomwa darasani kuonyesha nini kinatakiwa.
6. Hadithi za mtu mmoja mmoja za watoto.
7. Kuelezea kitabu cha darasa.

Tathmini:

Shughuli hii yaweza kuwa kama zoezi la kukamilisha muunganiko wa kila kilichofundishwa wakati wa ziara. Shughuli hii (au shughuli ya Uchoraji wa Mabango) itumike kama somo la kuhitimisha shughuli. Tathmini inaweza kufanyika kutokana na uzuri wa hadithi, n.k.



Moja ya hadithi ya mwanafunzi mmoja mmoja

5. Kusanifu Tangazo (Bango)

Mkazo: 1. Ufahamu wa mazingira
2. Kuchora/kusanifu

Lengo: Kuonyesha ufahamu kuwa wote tunamiliki misitu na tunahitaji kufanya kazi pamoja ili kuhifadhi kwa ajili ya siku zijazo.

Umri drs: 5+

Muda dk: 30

Makusudi: 1. Kupanga kwa ufupi ujumbe juu ya jinsi ya kutunza msitu wa hifadhi.
2. Kuweza kuchora ujumbe kwa njia husika.

Zana:

Karatasi aina ya A4
Michoro mbalimbabli na kalamu za kuchorea.

Mbinu/Njia:

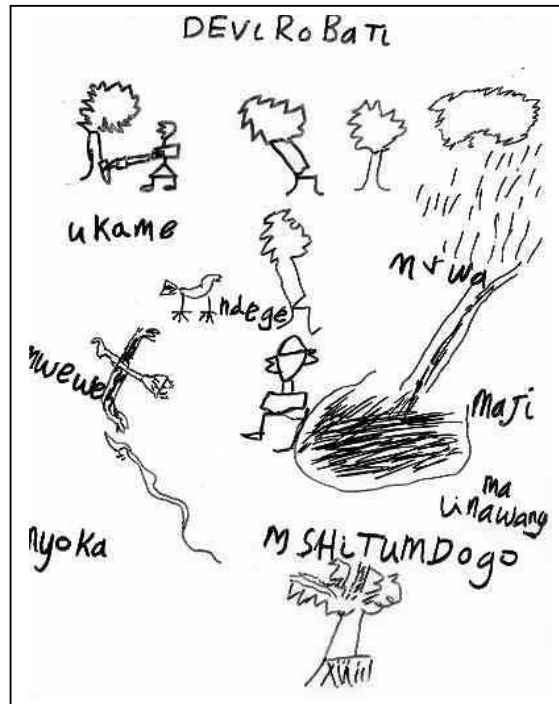
1. Katika kipindi cha Maswali na Majibu, wanafunzi wataulizwa kwa nini msitu ni muhimu na nini chaweza kudhuru msitu mfano uwindaji, uchafuzi wa maji, upasuaji mbao. Njia za kutunza msitu zitajadiliwa wakati huu. Maoni yataandikwa ubaoni.
2. Watoto watatakiwa kuchora/kusanifu bango la kushawishi watu kutunza msitu kwa matumizi ya baadae.

Mwedelezo wa Somo:

Kwa watoto wakubwa (miaka 8+) mawazo na vitu vya kuchora vinaweza kufanya vigumu zaidi, na bango linaweza kuwa na maelezo mengi zaidi.

Tathmini:

Shughuli hii inaweza kuwa kama zoezi la kukamilisha muunganiko wa kila kilichofundishwa wakati wa ziara. Shughuli hii (au shughuli ya Kitabu cha Darasa) itumike kama somo la kuhitimisha shughuli. Ni vizuri baadhi ya mabango yakatunzwa kama kielelezo au yakachukuliwa kutoka shuleni baadaye.



Bango la mazingira la mwanafunzi.

6. Meza ya Utambuzi

Mkazo: 1. Utapakao wa vitu asilia.

Umri: 5+

Urefu wa somo: dakika 30

Madhumuni: Kuhamasisha uelewa wa vitu asilia kwa kufanya mchezo wa kuamua kutambua vitu.

Lengo: 1. Kuongeza ufahamu wa watoto wa asili inayowazunguka.

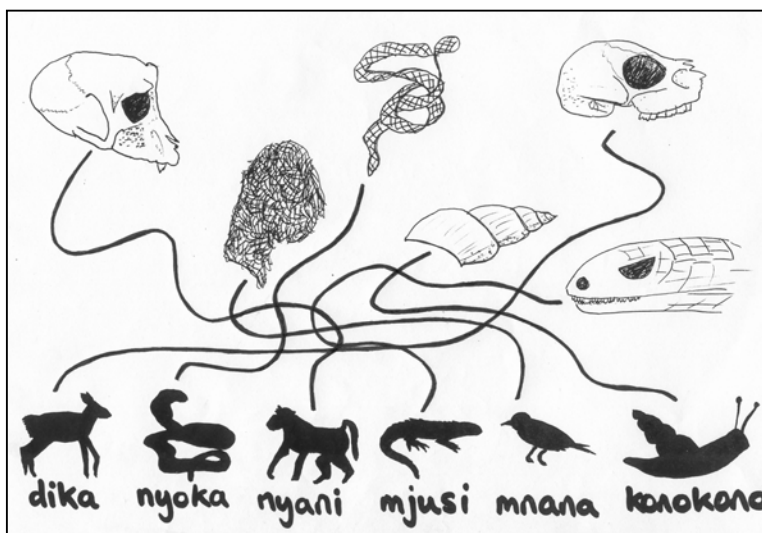
Zana: vitu asilia toka msituni, mfano fuvu, gamba la nyoka, nyumba ya konokono, maotea ya mti, gome la mti.

Mbinu:

1. Panga vitu vyenye kutia hamasa kwenye meza na uliza watoto waeleze ni mnyama/mmea gani vitu hivi vimetokana navyo.

Mwendelezo wa somo:

2. Watoto wanaweza wakakusanya vitu vyao wenyewe na kutengeneza meza yao ya utambuzi. Wanaweza wakachora wanyama/mimea ambayo vitu vimetokana navyo na kufikiria tabia ya vitu hivyo.



Picha inayounganisha kipengele cha msitu na wanyama wake

3. ANDALIO LA KAZI

Author: Oliver, S.A. Pp. 73-111.

1. Chemshabongo

Madhumuni: 1. Kuongeza ufahamu wa bioanuwai katika msitu wa hifadhi na umuhimu wake.
2. Kukuza ujuzi wa lugha.

Lengo: Kuendeleza ujuzi wa kusoma na tahajia (spelling) na ung'amuzi wa maneno katika chemshabongo.

Vifaa: Karatasi ya chemshabongo
Penseli za kuandikia

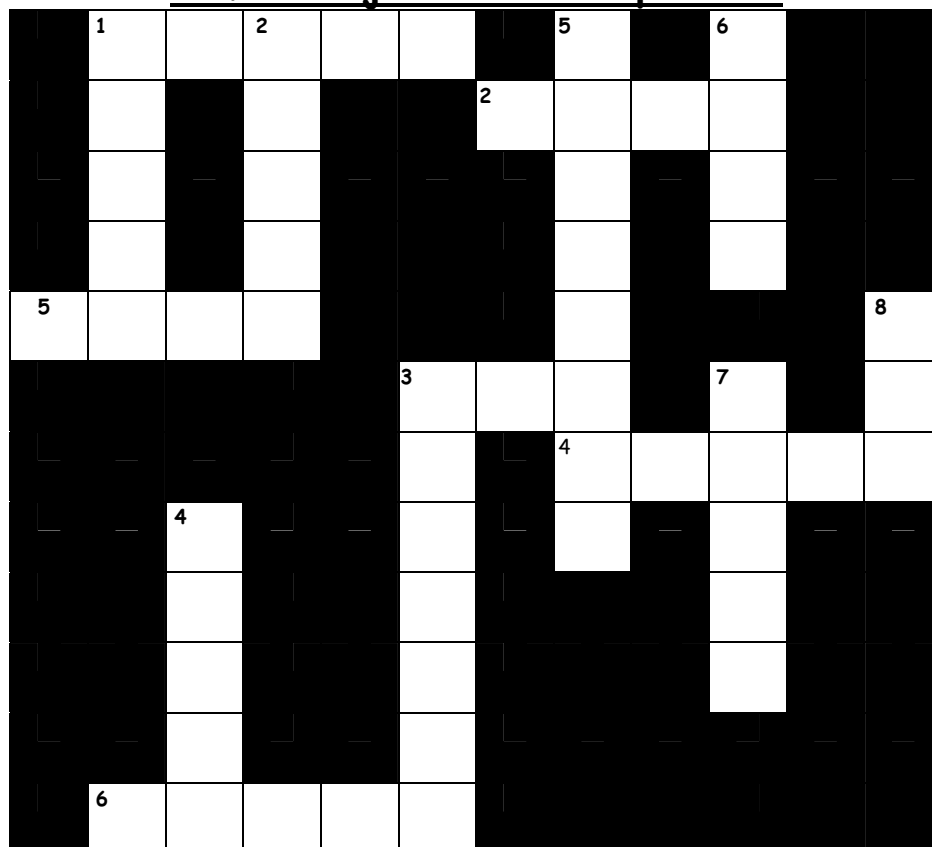
Mbinu/Njia:

1. Mwalimu ataeleza chemshabongo ni nini (au atawauliza watoto wakubwa kuelezea maana), k.v. maneno yanaingiliana na majibu yamefichwa katika maelezo.
2. Soma maelezo ya kwanza kama mfano na jaza jibu. Kisha onyesha kuwa kila neno linalokatiza jingine ile herufi, pale yanapounganika, lazima iwe katika kila neno, na katika sehemu sahihi. Jaza jibu la pili kama kuna ulazima huo. Gawa karatasi za chemshabongo.

Tathmini: Matokeo ya kazi yenyewe

Mwedelezo wa somo:

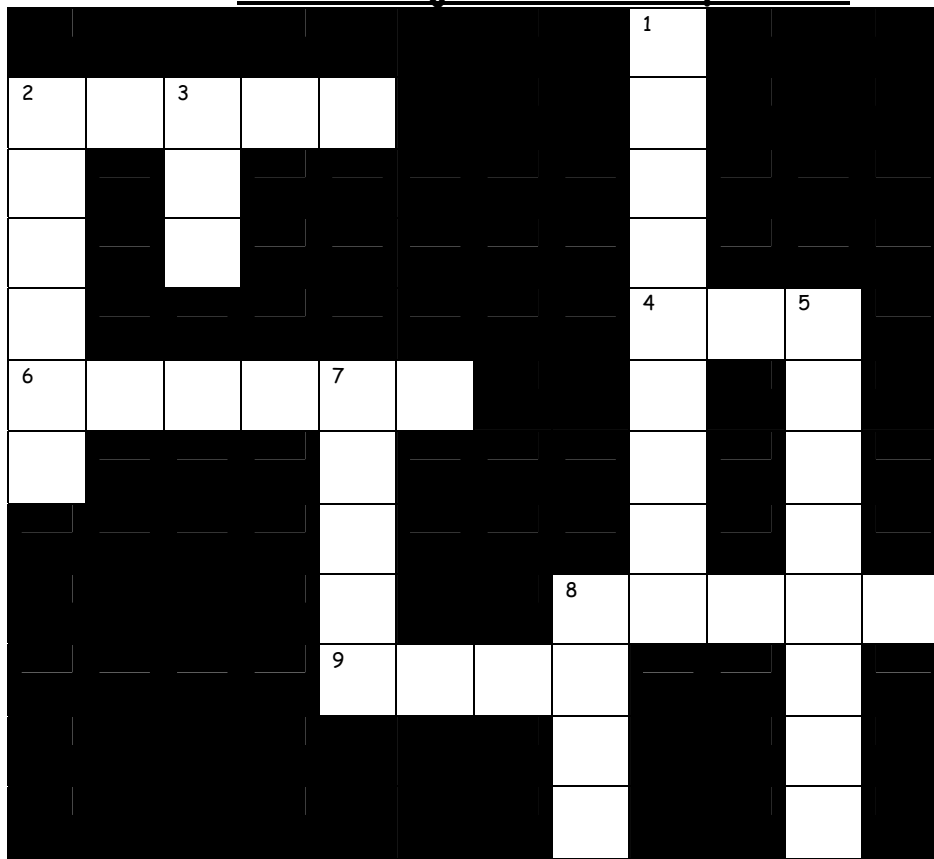
Kwa namba na maneno magumu zaidi.

Mfano chemshabongo**CHEMSHABONGO 1****Kamilisha jedwali hili hapo chini****Kwenda kulia**

1. Mnyama mdogo hutoa sauti usiku.
2. Kinatumika kupikia chakula.
3. Unaweza kupata maji kutoka humo.
4. Anafanana na binadamu, huishi msituni.
5. Mti utumikao kupanda kwenye mpaka wa msitu.
6. Ndege anayeruka usiku na kupiga kelele ya 'uuuuuh'.

Kwenda chini

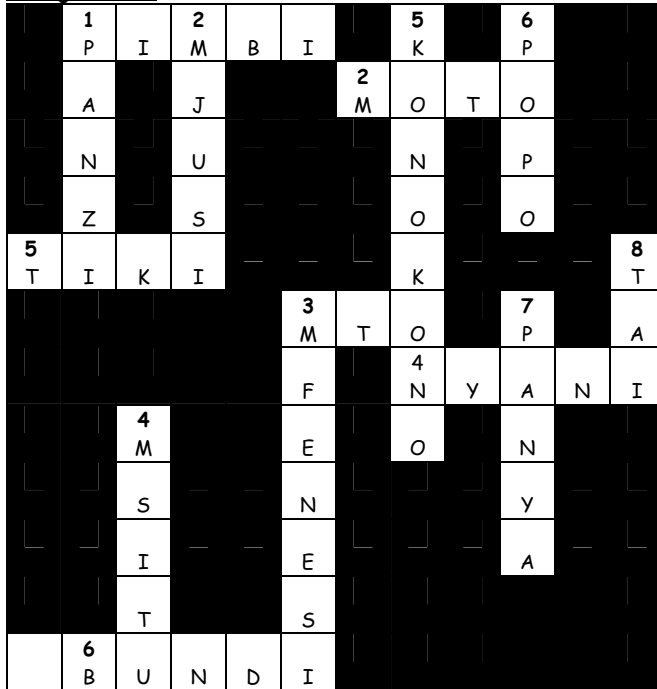
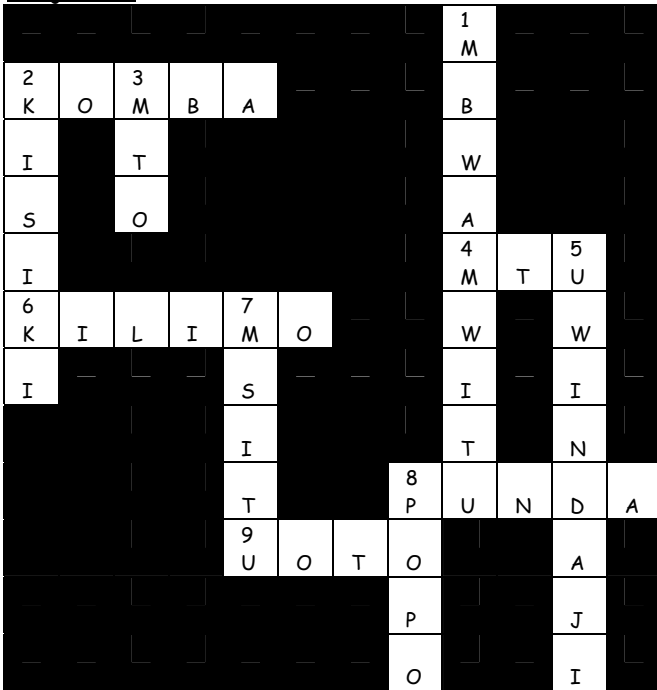
1. Mdudu arukaye, huliwa na ndege.
2. Kama nyoka, lakini ana miguu.
3. Aina ya mti wenye matunda makubwa yanayoliwa na yanautonvu.
4. Mahali palipoota miti na wanaishi wanyama pia.
5. Hutembea pole pole na nyumba yake mgongoni.
6. Mnyama huyu hupaa usiku na anapenda kuning'inia.
7. Mnyama mdogo mwenye shurubu na mkia.
8. Ndege mkubwa anayependa ku chukuwa wanyama.

CHEMSHABONGO 2Kamilisha jedwali hili hapo chiniKwenda kulia

- 2) Mnyama mdogo anapenda pombe.
- 4) Binadamu.
- 6) Ni tegemeo la watu kwa kujipatia chakula na mazao ya biashara.
- 8) Mnyama anatumika kubebea mizigo.
- 9) Hali ya kuwepo mimea/maotea.

Kwenda chini

- 1) Mnyama jamii ya mbwa anaishi porini.
- 2) Nini kinabakia mti ukikatwa.
- 3) Ni maji yanayotiririka bondeni kwa uelekeo maalumu.
- 5) Ni shughuli inayohusisha kuua wanyama.
- 7) Unamchanganyiko wa miti, majani na wanyama.
- 8) Ni mnyama apaaye angani hasa usiku na hupenda kuning'inia.

Majibu 1**Majibu 2**

2. Kuunganisha Doti Kuchora Picha

Madhumuni: Kusaidia kuona na kutambua mazingira ya msitu.
Kusaidia wanafunzi kujiamini katika hesabu na namba.

Lengo: Kurahisisha namba zinazofuatana

Vifaa: Katatasi yenye vidoti-doti ambavyo ukiviunganisha vinatoa picha fulani au umbo fulani.
Kalamu za kuandikia na kuchorea za rangi.

Njia/Mbinu:

1. Kwa watoto wadogo, mwalimu anaweza kumchagua mtoto mmoja kuhesabu 'moja' na kisha mtoto wa anayefuata kuhesabu 'mbili', na kuendelea, kuona mfuatano/mwelekeo kutoka namba moja hadi nyingine.
2. Ama vilevile, mwalimu anaweza kuelezea tu kuwa kinachotakiwa ni kuunganisha vidoti kwa mfuatano wa namba na kuuliza mmojawapo ameelewaje kabla ya kugawa karatasi. Picha zitakazotokea zitakuwa za vitu vya asili vinavyopatikana msituni.

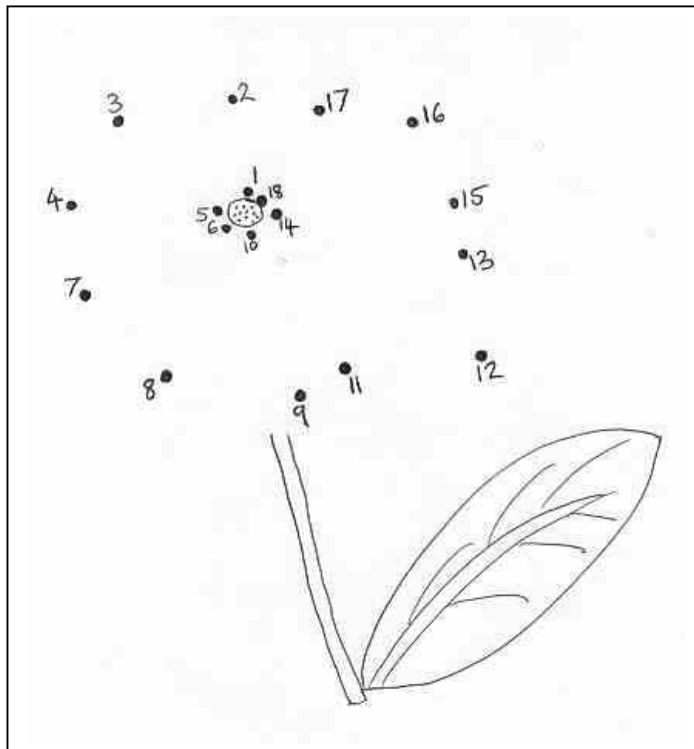
Tathmini: Ni kuona picha halisi ama umbo halisi lililotaki wa limejitokeza.

Mwendelezo wa somo:

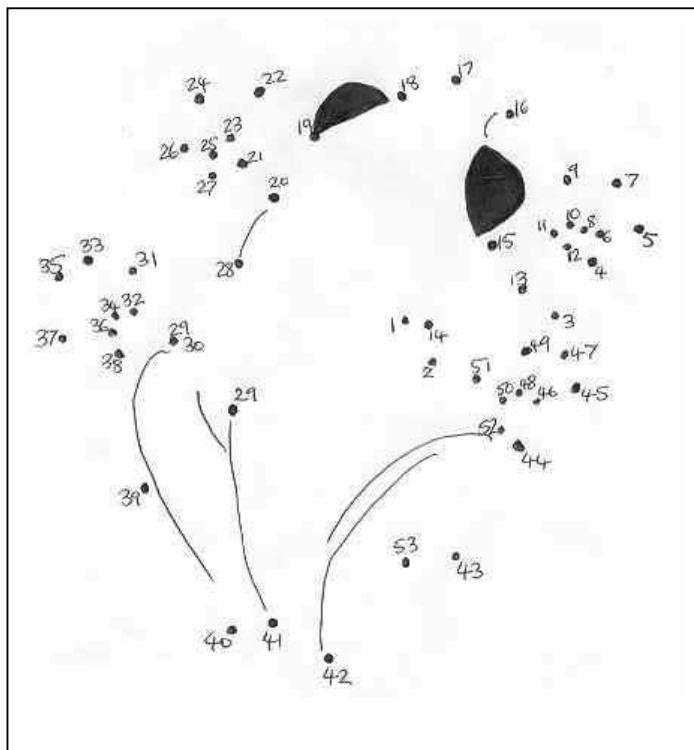
Ugumu wazoezi unaweza kurekibishwa kutokana na namba za doti na maudhui ya picha. Picha zaweza kupakwa rangi baada ya kukamilika.

Mfano picha za doti-kwa-doti

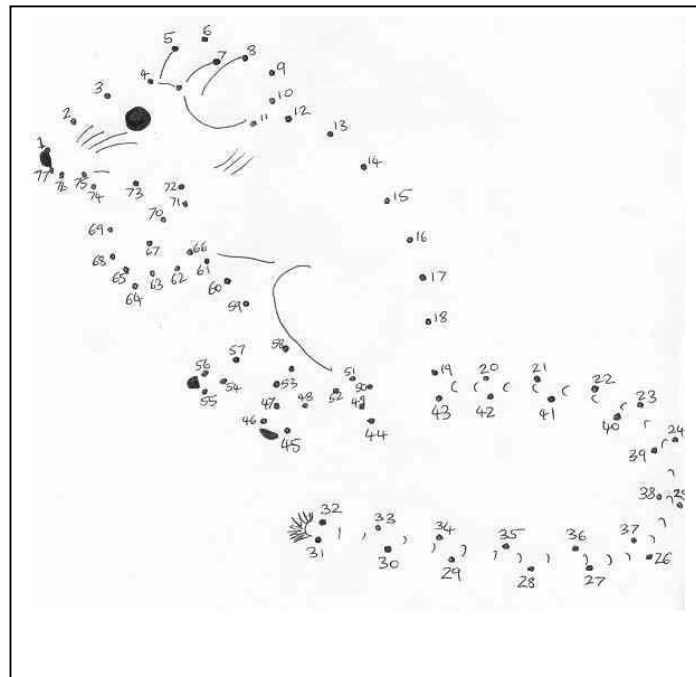
Picha 1:



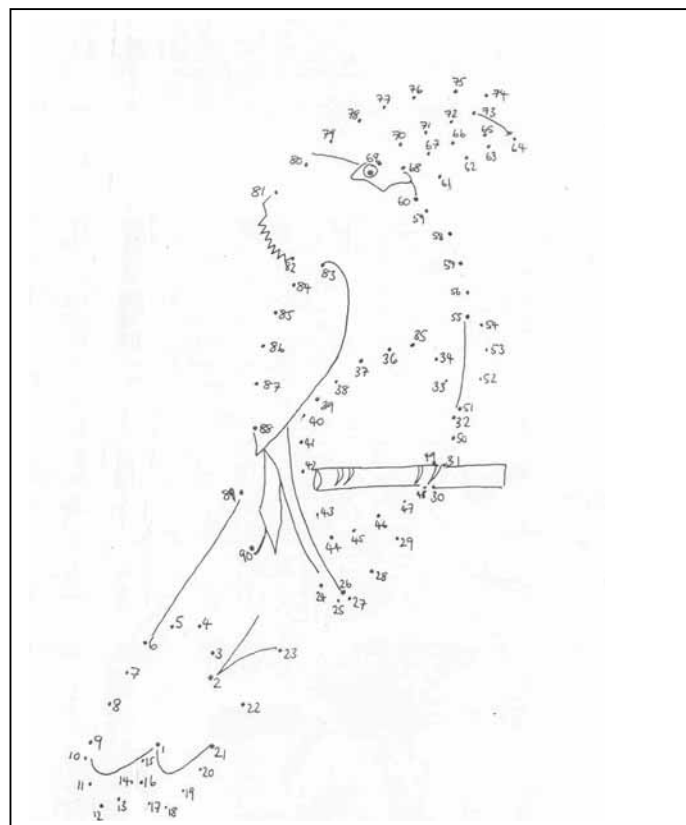
Picha 2:

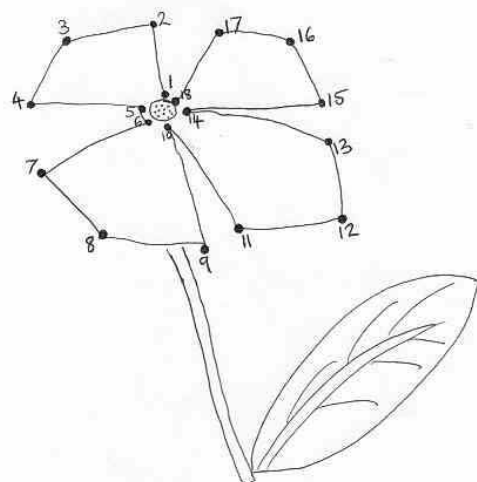


Picha 3:

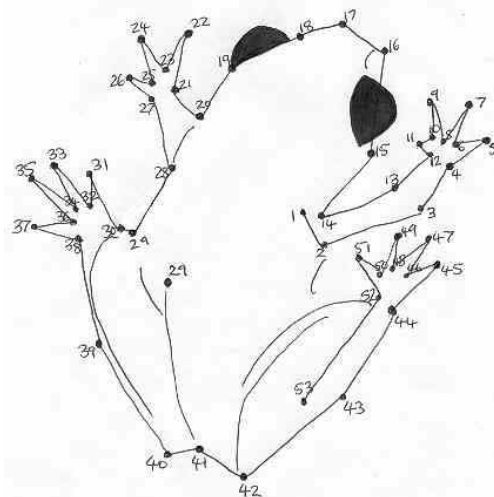


Picha 4:

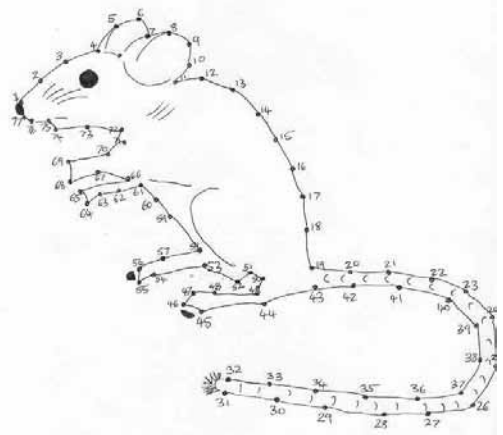


Majibu:

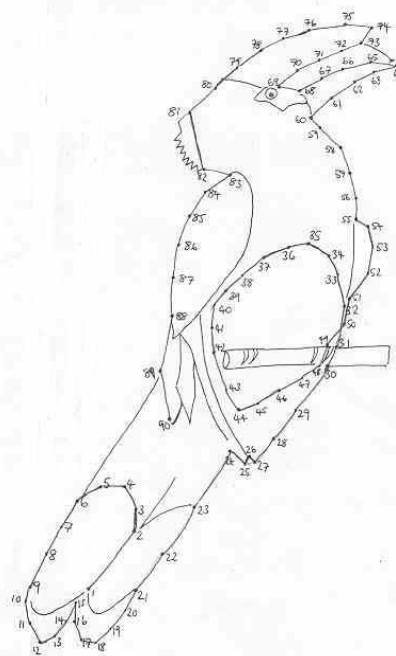
1. Ua



2. Chura



3. Panya



4. Ndege

3. Kutafuta Maneno Katika Jedwali

Madhumuni: 1. Kuongeza ufahamu wa bioanuwai katika msitu wa hifadhi.
2. Kukuza ujuzi wa tahajia (spelling skills).

Lengo: Kuweza kuhawilisha utambuzi wa neno toka chini ya karatasi, kulikumbuka na kulingamua neno hilo katika mraba fito.

Vifaa: Mraba fito (jedwali) la maneno.
Kalamu za kuandikia

Njia/Mbinu:

1. Waonyeshe watoto karatasi ya jedwali na elezea kuwa maneno chini ya karatasi yamefichwa ndani ya mraba fito. Uliza ni jinsi gani maneno yanaweza kupatikana. Tafuta herufi ya kuanzia. Elezea nini kitatokea ikiwa zaidi ya neno moja yataanza na herufi hiyo.
2. Toa mfano uliofanywa na tafuta neno jingine katika orodha. Gawa karatasi za mraba fito/jedwali.

Tathmini: Kiasi cha maneno yaliyopatikana.

Mwedelezo wa somo:

Maneno magumu zaidi katika jedwali kubwa zaidi.

Mfano jedwali la maneno

Jedwali la maneno 1

Kwa kutumia jedwali hili tafuta maneno yenye maana kwa kuyazungushia viboksi, mfano ‘popo’.

p	o	p	o	m	m
a	j	u	a	o	l
n	a	m	i	t	i
y	n	t	a	o	m
a	i	o	n	p	a

popo

moto

miti

jua

mlima

jani

panya

mto

Jedwali la maneno 2

Kwa kutumia jedwali hili tafuta maneno yenye
maana kwa kuyazungushia viboksi, mfano 'bonde'.

b	u	n	d	i	o	d	r	a	t	k	l	m	m	n	b
o	v	w	u	e	h	u	n	i	m	a	w	i	n	g	u
n	l	l	o	u	j	e	r	j	k	i	m	a	g	u	n
d	k	j	r	m	a	j	a	n	i	w	p	l	t	a	y
e	o	a	u	i	o	d	k	v	n	a	l	s	i	u	v
j	k	t	m	t	o	t	i	l	y	d	f	k	y	m	m
t	u	m	b	i	l	i	o	a	o	n	e	b	m	l	a
s	p	a	t	s	s	l	w	k	n	s	h	g	m	l	u
h	e	n	k	n	y	n	b	e	g	a	h	y	e	l	w
y	p	f	w	y	p	a	n	y	a	v	u	a	a	u	a
b	o	h	k	a	n	o	u	g	n	b	t	g	m	m	u
k	o	r	o	n	g	o	s	n	y	u	k	i	f	b	h
m	s	y	k	i	p	e	p	e	o	a	h	k	y	e	a
s	b	a	a	u	o	a	b	v	k	i	p	a	n	g	a
i	w	s	h	y	p	y	f	y	a	o	g	m	v	u	a
t	h	o	n	d	o	h	o	n	d	o	m	g	u	h	o
u	k	i	l	e	l	e	t	p	c	h	u	r	a	l	i

bonde	kilele	korongo	mlima	mbega	panya
bundi	kima	majani	mmea	ndege	popo
chura	kinyonga	mauwa	moto	njia	shamba
hondo hondo	kipanga	mawingu	msitu	nyani	tumbili
jabali	kipepeo	mbegu	mtu	nyoka	upepo
jua	komba	miti	mvua	nyuki	watu

Majibu 1

p	o	p	o	m	m
a	j	u	a	o	l
n	a	m	i	t	i
y	n	t	a	o	m
a	i	o	n	j	a

Majibu 2

b	u	n	d	i	o	d	r	a	t	k	l	m	m	n	b
o	v	w	u	e	h	u	n	i	m	a	w	i	n	g	u
n	l	l	o	u	j	e	r	j	k	i	m	a	g	u	n
d	k	j	r	m	a	j	a	n	i	w	p	l	t	a	y
e	o	a	u	i	o	d	k	v	n	a	l	s	i	u	v
j	k	t	m	t	o	t	i	l	y	d	f	k	y	m	m
t	u	m	b	i	l	i	o	a	o	n	e	b	m	l	a
s	p	a	t	s	s	l	w	k	n	s	h	g	m	l	u
h	e	n	k	n	y	n	b	e	g	a	h	y	e	l	w
y	p	f	w	y	p	a	n	y	a	v	u	a	a	u	a
b	o	h	k	a	n	o	u	g	n	b	t	g	m	m	u
k	o	r	o	n	g	o	s	n	y	u	k	i	f	b	h
m	s	y	k	i	p	e	p	e	o	a	h	k	y	e	a
s	b	a	a	u	o	a	b	v	k	i	p	a	n	g	a
i	w	s	h	y	p	y	f	y	a	o	g	m	v	u	a
t	h	o	n	d	o	h	o	n	d	o	m	g	u	h	o
u	k	i	l	e	l	e	t	p	c	h	u	r	a	l	i

4. Nyayo kwenye Njia za Wanyama

Madhumuni: Kuonyesha kuwa wanyama huacha vidokezo vingi vya kuwepo kwao. Kuhamasisha ujuzi wa utambuzi wa alama baadaye.

Lengo: Kuhamasisha uangaliaji wa alama za wanyama na tabia zinazohusiana nao.

Vifaa: Karatasi za alama (mabango ya alama/nyayo) zinazohusiana na picha za wanyama (jina liwe chini).

Njia/Mbinu:

Yafuatayo ni mapendekezo ya matumizi ya karatasi za alama:

1. Mchezo mdogo darasani, alama ya unyayo itawekwa juu na kuuliza ni (picha ipi ya) mnyama anaweza kutengeneza unyayo huo.
2. Kama msaada katika maelezo, mf. kwa kichwa “Nani hutengeneza alama hii?” na mapito ya mnyama vyaweza kutoa utambuzi sahihi wa mnyama.
3. Karatasi ya mapito ya wanyama yaweza kutumika kufanya uchunguzi wa mazingira shuleni.
4. Kama ikiwekwa katika karatasi A4 (au ubao) alama zaweza kutumika kwa zoezi rahisi la kuhusianisha alama na wanyama kwa watoto wadogo.
5. Yaweza kuwa msaada (ubao wa kuchupia) katika uandishi wa hadithi.

Nyayo za njia za wanyama

 1. Nyani	 2. Fungo
 3. Nguchiro	 4. Pelele
 5. Digi digi	 6. Kuchakuro

5. Wanyama na Makazi yao

Madhumuni: Kuongeza ufahamu wa wanyama na mahitaji yao.

Vifaa: Vipande vya karatasi vyenye picha za wanyama, ubao na chaki.

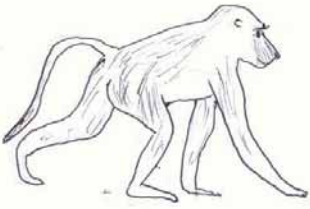
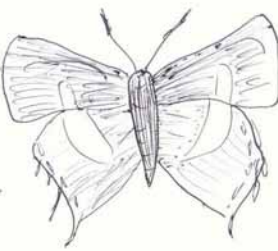
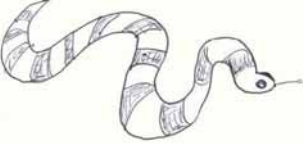
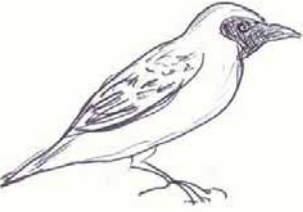
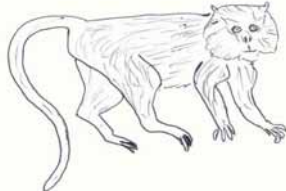
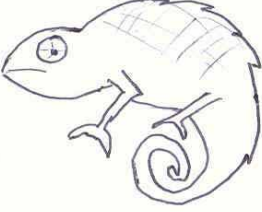
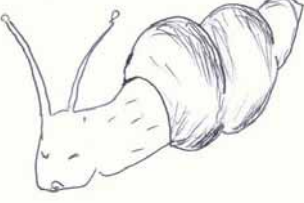
Njia/Mbinu:

1. Elezea neno ‘Makazi’. Jadili wapi tunaishi na nini tunakula.
2. Baadae waambie watoto kufikiria wanyama wanaohitaji msitu kwa makazi. Chukua kipande cha karatasi chenye picha ya mnyama na lionyeshe darasa. Waulize wanadhani mnyama huyo huwa macho wakati wa mchana au kama hutembea usiku.
3. Ugawe ubao katika sehemu mbili kukiwa na ‘jua’ upande mmoja na ‘mwezi’ upande mwingine. Kwa kila mnyama aliyejadiliwa mbandike kwenye upande wa ubao kwa kutumia ‘selotape’ kutegemea kama hutembea mchana (diurnal) au usiku (nocturnal).

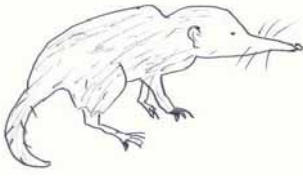
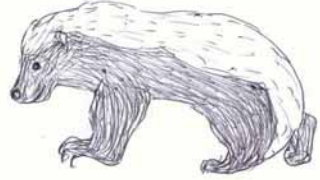
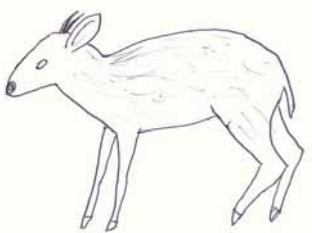
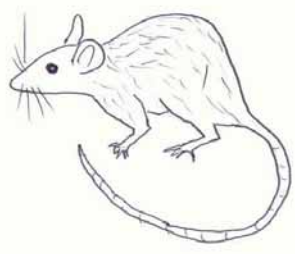
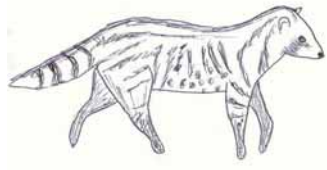
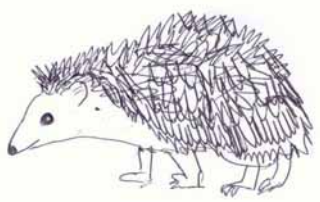
Mwendelezo wa Somo:

4. Rudia zoezi sasa kwa kuweka kila mnyama kwenye makazi yake, mf. Makazi ya msituni, shambani, nk. kwa kuandika makazi haya ubaoni.
5. Fundisha juu ya ‘mtiririko wa chakula’ (food chains) kwa kuwauliza watoto nini mnyama anaweza kula na nini kinaweza kumla yeye. Panga picha za wanyama ubaoni katika mtindo wa ‘mtandao wa chakula’ (food web).

Picha za wanyama wa mchana (diurnal)

		
Nyani	Kipepeo (hoho)	Balale (halala)
		
Mwewe (kinpanga)	Nyoka	Chura (jula)
		
Mbega (mbegha)	Hondo hondo (hondo)	Mtu (mntu)
		
Kuchakuro (nkenda)	Nofi (ntaa)	Mjusi (ghondo)
		
Kima (ndue)	Kinyonga (uvi)	Kono kono (kozwe)

Picha za wanyama wa usiku (nocturnal)

		
Popo (nundu/lipo)	Panya (ngoshwe)	Melesi
		
Digi digi (paa)	Kanu (ukui)	Perere (npee)
		
Bundi	Panya (ngoshwe)	Komba (nkomba)
		
Nguruwe (nguwe) (neni za Kisambaa)	Fungo	Nungunungu

6. Jaribio La Mazingira

SEHEMU YA KWANZA:

**Chagua jibu sahihi na ulizungushie duara.
Kuna majibu mawili si sahihi lakini moja ni sahihi.**

- 1. Kwa nini hatutakiwi kufua nguo mtoni pasipo kutumia ndoo au dishi?**
 - a) Kwa sababu tunapenda nguo zetu chafu.
 - b) Kwa sababu sabuni tunayo tumia inaweza kuchafua maji.
 - c) Kwa sababu hatutaki mikono yetu ipate maji.
- 2. Nini hutokea wakati chupa ya mpira au mifuko ya mpira endapo itatupwa ardhini?**
 - a) Inageuka kuwa udongo.
 - b) Inasaidia mimea kukua.
 - c) Haiozi.
- 3. Ni njia gani nzuri tungetumia kutupa mabaki ya chakula?**
 - a) Kufukia ilikuya fanya ya oze.
 - b) Kuzichoma ilikufanya moto mkubwa.
 - c) Kuzitupa uwanjani kuzunguka nyumba.
- 4. Tutapataje nguzo za kujengea pasipo kutumia njia haramu za uharibifu wa misitu yetu ya hifadhi?**
 - a) Kwa kununua nguzo mbali kutoka misitu mingine ya hifadhi.
 - b) Kupanda miti ya vitalu katika kijiji chetu.
 - c) Kwa kuchukua nguzo tu katikati ya misitu wa hifadhi.
- 5. Ni jinsi gani misitu ya hifadhi hurekebisha hali ya hewa.**
 - a) Kutowekupo kwa miti jua halitaweza kuwaka.
 - b) Miti huzuia theluji kutelemka.
 - c) Miti kufanya kukusanyika kwa mawingu kiasi kwamba mvua inaweza kunyesha.
- 6. Ni madhara gani yatokanayo na betri zilizokwisha kutumika ziwapo ardhini?**
 - a) Wanyama hutumia kuzimeza.
 - b) Hufanya mimea kukua haraka kuliko kawaida.
 - c) Zinavujisha sumu hatari ardhini.
- 7. Kwanini ni muhimu kuwa waangalifu na moto katika mashamba yetu?**
 - a) Unaweza kuunguza pasipo udhibiti.
 - b) Kwa sababu unafurahia kuangalia.
 - c) Kwa sababu tunawasha mara moja kwa mwaka.

SEHEMU YA PILI:

Jibu gani kati ya haya yafuatayo si sahihi?

Kati ya majibu yafuatayo, Manne ni sahihi na moja tu si sahihi.

Zungushia duara kwa jibu ambalo si sahihi, Jibu (a, b, c, d, au e) .Tumia penseli.

8. Misitu ya hifadhi ni muhimu kwa sababu

- a) Ndio vyanzo vya maji ambayo tunahitaji kwa maisha ya kila siku.
- b) Ni nyumba / makazi ya viumbe kama wanyama na mimea ambavyo ni ya kipekee ambavyo huwezi ukavipata sehemu nyingine yeyote hapa duniani.
- c) Inapatikana mimea adimu ambayo mara nyingine hutumika kwa madawa na mila za asili.
- d) Hutusaidia katika ukusanyaji wa kuni kwa ajili ya kupika.
- e) Tunaweza kutumia miti kwa vinyago, ujenzi na kuwindia wanyama.

9. Kwanini tunaweza makazi yetu na vijiji safi na mbali na uchafu?

- a) Husaidia kuzuia usambazaji wa magonjwa.
- b) Huweka vijiji vyetu bora katika mpira wa miguu.
- c) Kupunguza namba ya panya na viumbe waharibifu karibu na makazi yetu.
- d) Hufanya tujisikie na uwekaji wa vijiji vyetu vema.
- e) Kuongeza ubora wa udongo na mitaa yetu.

10. Kwanini ni muhimu kwa sisi kulinda mifumo yetu ya maji?

- a) Ili tuwe na maji ya kutosha ya kunywa kwa miaka yote.
- b) Ili tuweze kunywesha mifugo.
- c) Ili vijiji vingine visiwe na chochote.
- d) Ili tuwe na maji safi ambayo hutuweka salama kiafya.
- e) Kwa ajili ya kumwagilia mazao yetu kipindi cha ukame.

SEHEMU YA TATU

Maswali machache unayoweza kuongelea shuleni...

●Waweza vipi kukifanya kijiji chako kisiwe kimetapakaa uchafu?

Pengine waweza kuweka vifaa vya kukusanyia uchafu kwenye shule au sehemu nyingine za umma. Tumia mifuko iliyotengenezwa kwa nyuzi za asili n.k.

●Wapi yafaa kuweka uchafu wa vitu visivyotengenezeka upya (non-recyclable) kama vitu vya plastiki na betri za zamani?

Katika shimo lililotengwa na kijiji mbali na vyanzo vya maji na mashamba.

●Wajua jinsi ya kuotesha mti?

Inahitaji udongo mzuri na maji mengi kwa kuanzia.

●Tunawezaje kuboresha ufuaji wetu wa nguo?

Tunaweza kuchota maji mtoni katika ndoo na kumwaga maji ya sabuni mbali na mto ili yasichafue maji yetu ya kunywa (au ya vijiji vingine chini zaidi ya mto)

MAJIBU

1 b, 2 c, 3 a, 4 b, 5 c, 6 c, 7 a, 8 e, 9 b, 10 c.

7. Mchezo wa ‘Maji Safi’

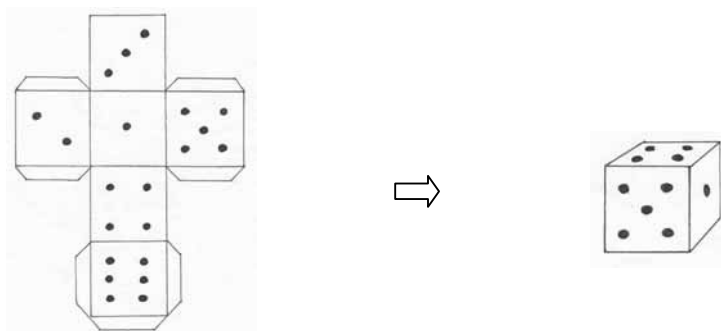
Umri: 12+

Madhumuni: Kwa watoto kufikiri juu ya mambo yanayoharibu ubora wa maji nakukazia maarifa umuhimu wa kuweka vyanzo vya maji safi.

Zana: Ubao wa mchezo
‘die’ moja
Vihasabio (mf. vizibo vya soda).

Mbinu:

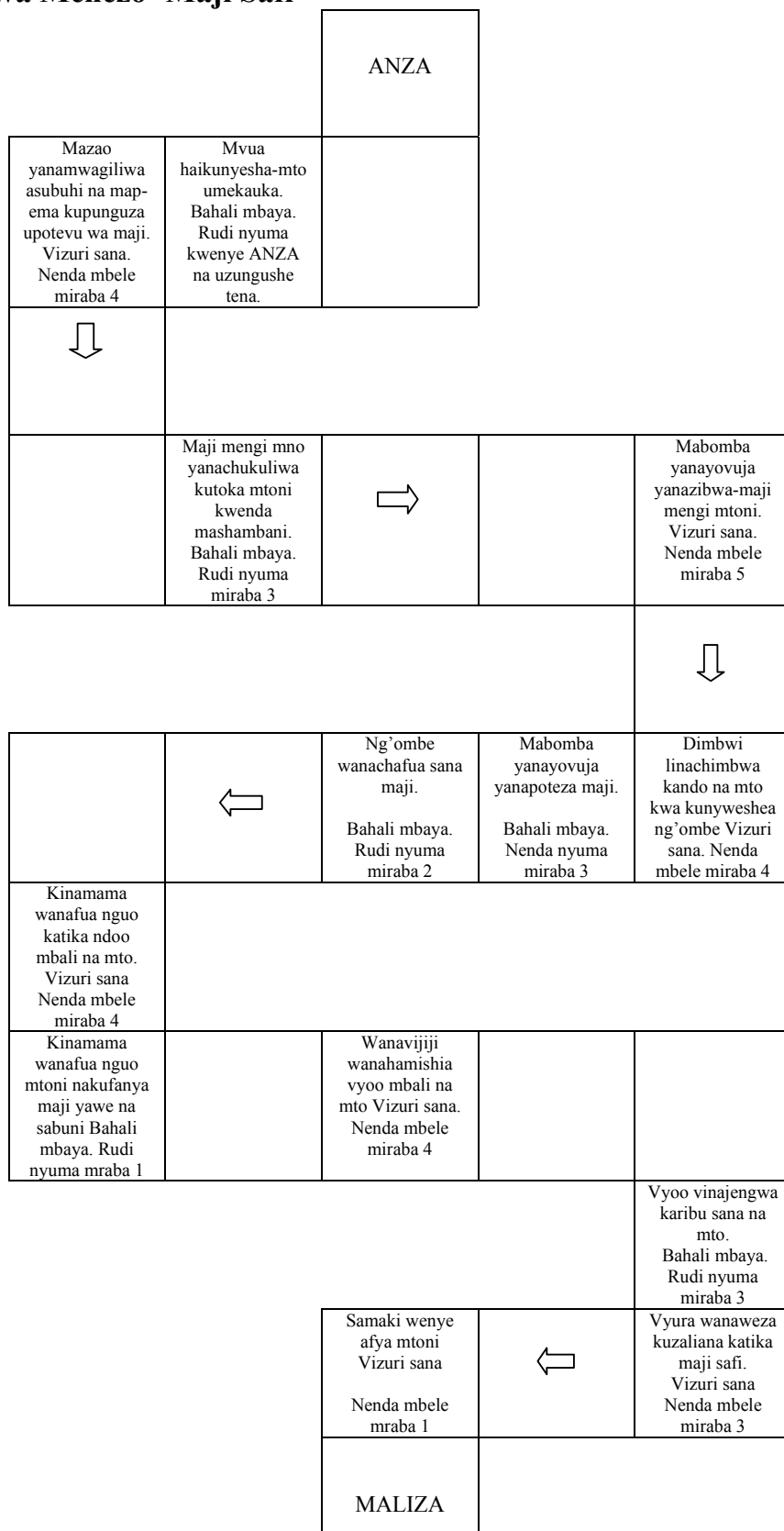
1. Kwanza jadilianeni mahitaji ya maji safi. Waulize watoto tunatumia maji kwa kazi gani (mf. kwa kunywa, kupikia, kuoshea na pia kwa mifugo yetu na mazao)
2. Waonyeshe ubao. Lengo la mchezo ni watoto wajifunze juu ya mambo yanayoharibu ubora wa maji na vilevile njia zinazoweza kuzuia uharibifu huu. Mtoto atakutana na haya matatizo jinsi anavyoutambaa ubao kwenda chini. Sehemu ya ANZA inawakilisha mwanzoni mwa chanzo cha maji, na sehemu ya MALIZA ni sehemu ya chini ya mto ambapo maji huchukuliwa kwa matumizi kijijini.
3. Wachezaji wawili au watatu wataweka vihasabio vyao katika sehemu ya ANZA
4. Mchezaji wa kwanza atazungusha ‘die’ yake nakusogeza kihesabio chake mbele miraba kadhaa kwa kiasi itakavyoonyeshwa na ‘die’. Kama mchezaji ataishia kwenye mraba ulio tupu, atatulia hapo hadi zamu yake tena itakapofika. Kama akifikia mraba wenye maandishi atasoma na kusogeza tena mbele au nyuma kutegemea na nini kimeandikwa.
5. Kila mchezaji atazungusha ‘die’ kwa zamu. Mchezaji atakayefika au kuvuka



MALIZA mwanzo ndiye mshindi.

Chora umbo kama hili juu ya karatasi ngumu na kata kwa pembeni yake. Kunja kipande ulichokata kiwe mfano wa boksi dogo (mfano wa ‘die’ hapo juu). Tia gundi sehemu ya pembeni (iliyotiwa kivuli) ili kufanya boksi liwe imara. Hii sasa ni ‘die’ yako!

Ubao wa Mchezo ‘Maji Safi’



8. Andaa Siku ya Mazingira

Madhumuni: Kwa shule kuwa na jukumu hai la Kukuza mwamko wa mazingira kwa jamii.

Zana: Karatasi za mabango
Kalamu za kuchorea, n.k.,

Mbinu:

Iweje Siku ya Mazingira:

1. Chagua siku katika kalenda (pengine inayoendana na Wiki ya Mazingira Duniani)
2. Kuwe na kipindi cha majadiliano kupata nini cha kufanya siku hiyo. Baadhi ya mawazo ya naweza kuwa:
 - Kutunga na kuimba wimbo wa mazingira.
 - Imba/ghani shairi la mazingira
 - Tengeneza mchezo wa kuigiza unaohusu masuala ya mazingira
 - Endesha shindano la mabango/uandishi wa hadithi
 - Alika mgeni (guest speaker)
 - Upandaji miti



Mfano wa bango lililotumika kutangaza Siku ya Mazingira

9. Karatasi za Maelezo Halisi ya Viumbe

Madhumuni: Kuongeza ujuzi wa bioanuwai za msitu wa hifadhi.

Lengo: Kukuza stadi za kusoma: ufasaha, umakini, lafudhi, ‘kusoma kwa maana’, kuweza kuelewa makala na kujibu maswali yanayoihusu.

Vifaa: Karatasi za maelezo halisi.
Karatasi zisizoandikwa.
Penseli za kuandikia na kuchorea.

Mbinu/Njia:

Yafuatayo ni mapendekezo ya matumizi ya karatasi za maelezo halisi.

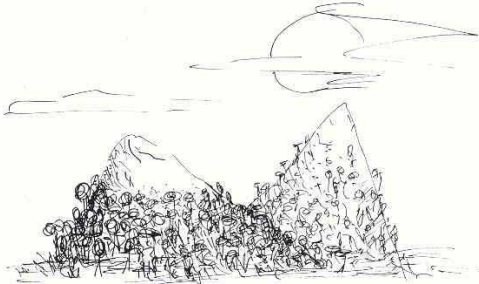
1. Kusoma kwa makundi baadhi ya karatasi kabla ya kuuliza maswali.
2. Karatasi za maelezo zaweza kutumika kama ‘mbao za kuchupia’ kwa watoto kuweza kuandika maelezo yao ya uhakika kuhusu wanyama wengine.
3. Watoto waweza kutunga vitendawili vinavyohusu wanyama wakimalizia na swali “Je, mimi ni nani?”. (Pengine na picha ya mnyama ikiwa imefichwa kwa chini).

Mwedelezo wa somo:

Kwa ugumu na upana zaidi.

Maelezo

MAELEZO YA KWANZA **Misitu ya hifadhi**



Ni ipi?

Msitu wa hifadhi Mlinga ni moja kati ya hifadhi za milima ya Usambara Mashariki. Milima ya hifadhi imeanzishwa ili kutunza vyanzo vya maji na miti pamoja na viumbe adimu wa mimea na wanyama wanaoishi ndani ya misitu.

Unajua je msitu wa hifadhi ulipo?

Msitu wa hifadhi una mpaka uliosafishwa majani yote. Maboya ya simenti yanaonyesha kona zote za mpaka wa msitu wa hifadhi. Mistari miwili ya miti imepandwa.

Mtunzaji wa misitu ni nani?

Bwana miti ana wajibu wa kusimamia utunzaji wa misitu. Anazuia uchomaji moto, ukataji miti hovyoyote, na uwindaji wanyama adimu. Pia husimama utunzaji wa mipaka ya misitu.

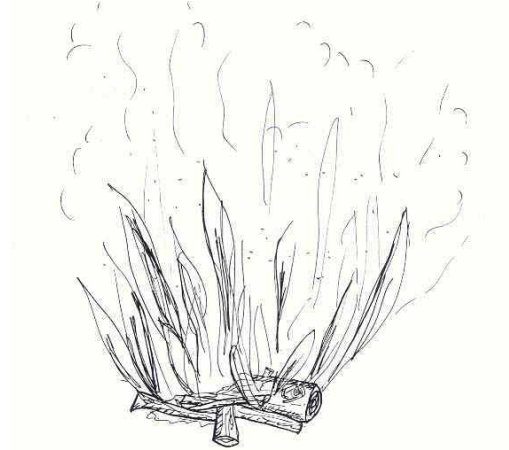
Wanaelimisha wananchi kutumia mazao ya misitu kwa njia endelevu. Ni wajibu wetu sote kusaidia kutunza misitu yetu. Ni kwa mamufaa ya kila mmoja wetu na tunahitaji tuwe nayo karibu.

Misitu mingine ya hifadhi Usambara Mashariki.

Ipo misitu mingi ya hifadhi katika milima ya Usambara Mashariki na hifadhi asili-moja. Hifadhi nyingine ni pamoja na hifadhi ya mazingira asili Amani, hifadhi ya Manga pamoja na hifadhi ya Segoma.

MAELEZO YA PILI

Moto



Ni nini?

Moto ni kitu ambacho kila mmoja wetu anatumia kupikia chakula. Utumikapo unafanya kila kitu kuwa cha moto. Mara nyingi tunatumia moto kutayarisha mashamba yetu. Tunaposhindwa kuudhibiti moto inakuwa ni hatari sana.

Ni nini moto wa msituni?

Moto huu hutokea pale eneo linapokauka sana. Mara nyingi watu huanzisha moto kwa bahati mbaya na husambaa schemu kubwa. Kwa sababu tunalima karibu na msitu. Moto wa mashambani pia huenea hadi msituni kwa bahati mbaya.

Kwa nini ni jambo baya?

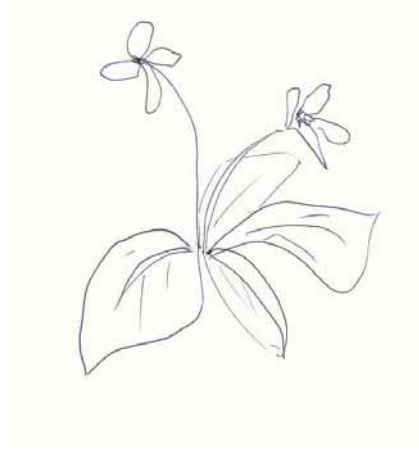
Ni jambo baya kuchoma moto msitu kwa vile huteketeza wanyama na mimea muhimu ipatikanayo humo. Pia huunguza miti ya zamani ambayo ingetumika kama kuni za kupikia.

Nini cha kufanya tuonapo moto msituni

Tuonapo moto msituni ni vyema kutoa taarifa haraka kwa afisa misitu ili asaidiane na wananchi kupanga namna ya kukabiliana na moto huo. Tunatakiwa tujivunie na misitu yetu na tuhakikishe ipo salama.

MAELEZO YA TATU

Mimea maalumu



Misitu yetu ina aina nyingi za mimea isiyo ya kawaida na isiyopatikana sehemu nyingine duniani. Kuna aina ya mimea uitwayo "Dughulishi" (African Violet) upatikanao Usambara mashariki tu. Hutoa maua mazuri yenye rangi ya zambarau.

Nchi nyingine watu huotesha maua haya kwenye vyungu ndani ya nyumba zao kwa vile wanayaona ni mazuri.

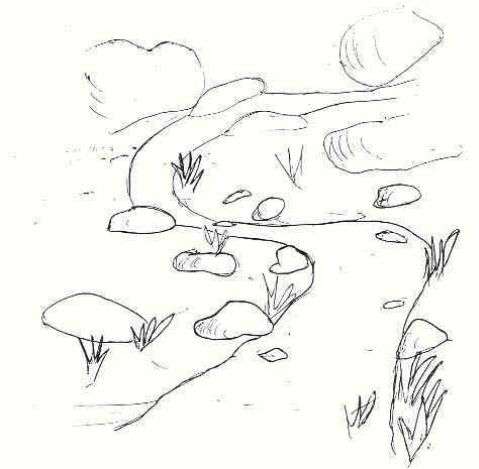
Baadhi ya mimea ya msituni ina faida nyingi kwetu. Tunaitumia kwa madawa na kukipa chakula ladha. Kama tusingekuwa na misitu mimea hii isingeweza kuota.

Jaribu kufikiria miti yenye faida

Jaribu kuandika orodha ya mimea yote ambayo inatunufaisha.

MAELEZO YA NNE

Maji



Maji ni nini?

Maji huanguka kama mvua kipindi cha msimu wa mvua. Hujaa kwenye mito na hutusaidia kuotesha mazao yetu. Tunahitaji maji wakati wote kwa ajili ya kunywa sisi na wanyama wetu vile vile kwa ajili ya kusafisha vitu mbali mbali.

Tunatunza maji

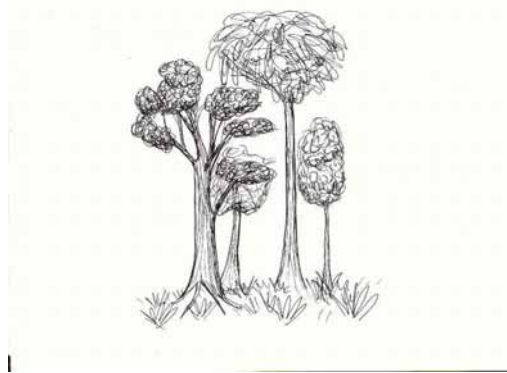
Maji ni Uhai. Ni lazima tuhakikishe tuna maji safi na salama ya kutumia vinginevyo tutapata maradhi. Maji yatakuwa masafi endapo hatutayafulia ama kuyachafua. Wakati mwingine hapa Tanzania hatupati mvua ya kutosha hivyo ni vizuri kutunza njia zetu zinazo tupatia maji. Kwa kutunza miti na misitu yetu, mvua zitaendelea kunyesha mara kwa mara.

Miti inahifadhi maji kwenye majani, shina na mizizi. Bila miti ardhi itakuwa kavu. Miti inadhibiti kiwango cha maji ya mvua kwenye mito.

Angalia nje, mawingu yalivyosheheni maji na kujituliza kwenye msitu wakati wa mvua!

MAELEZO YA TANO

Miti



Miti ni nini?

Miti ni aina ya mimea mikubwa ipatikanayo msituni. Watu pia hupanda miti nje ya misitu.

Kwa nini tunahitaji miti?

Tunapata matunda na mbao za kujengea myumba kutokana na miti tunayopanda.

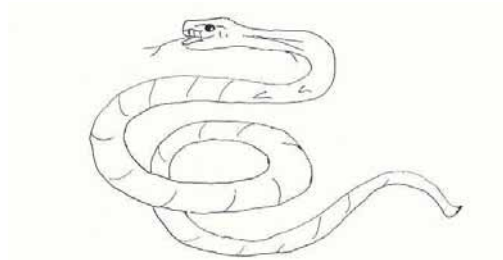
Tunaweza kuokota kuni kutoka kwenye misitu ya hifadhi lakini haturuhusiwi kukata miti iliyohai kwa sababu inashikamanisha udongo. Pia miti inatupatia hewa tuivutayo na kurekebisha hali ya hewa.

Ni nini kitatokea endapo hakutakuwa na miti?

Kama hakutakuwa na miti, hakutakuwa na mvua, maji ya kunywa na hewa tunayovuta. Pia hapatakuwa na mazingira ya kuota mimea pamoja na wanyama watakaishi msituni.

MAELEZO YA SITA

Nyoka



Nyoka ni nini?

Nyoka ni aina ya viumbe vyenye damu baridi vinavyoishi karibu duniani pote. Katika Afrika nyoka wengi wanaishi msituni. Watu wengine hawapendi nyoka kwa sababu wengine ni hatari na wana sumu. Ingawa wengine hawadhuru.

Nini unatakiwa kufanya umuonapo nyoka?

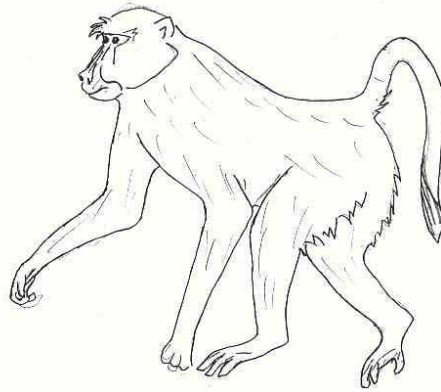
Kama utaona nyoka msituni tafadhali muache aende. Hawezi kukudhuru kama hukumkasirisha. Kitu muhimu cha kufanya ni kutomkaribia nyoka umuonapo.

Nyoka wa pekee

Milima ya Usambara mashariki ina aina ya nyoka wa pekee ambao hawapatikani sehemu nyingine duniani. Sehemu nyingine hufuga nyoka kama mapambo.

MAELEZO YA SABA

Nyani wa manjano



Nina ukubwa gani?

Ukubwa wangu ni kati ya (65-98sm) kutoka kichwani mpaka mwanzo wa mkiani. Nyani wa kiume huwa ni wakubwa zaidi ya majike.

Ninaishi wapi?

Nchi yote ya Tanzania zaidi katika ya misitu miombo lakini pia katika nchi kavu yenye vichaka na ukanda wa pwani. Ninahitaji majabali au miti kwa ajili ya kuishi kama nyumba. Ninahitaji kuishi karibu na maji ili kunywa maji kila siku. Nyani wanapatikana katika Bara la Afrika tu.

Ninakula nini?

Mbegu, majani na matunda. Pia maua, matunguu, maganda, magome, mizizina mashina. Chakula changu kikuu ni mboga mboga, lakini pia ninakula wadudu, nyoka na wanyama wadogo wadogo, vyura, kaa na samaki pindi wanapatikana.

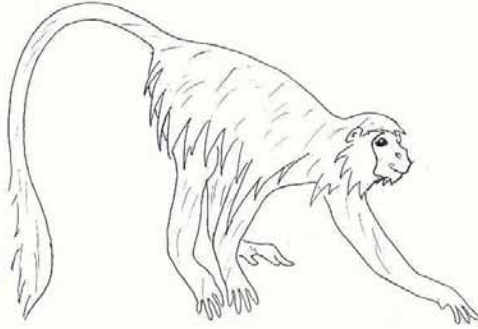
Je, nina mlilo gani wa sauti?

Ukweli zaidi

Ninaishi katika makundi yenye nyani weginge wengi. Wanawake hutunza watoto wakati wanaume wanaangalia kila mahali. Kama walinzi wa kundi.

MAELEZO YA NANE

Mbega



Mimi ni nani?

Mimi ni mbega, jamii ya nyani.

Nina ukubwa gani?

Ukubwa wa kawaida kati ya (60-75sm). Mdogo kuliko nyani.

Ninaishi wapi?

Ninaishi katika safu pana ya mazingira kama - mianzi, misitu ya tambarare au nyanda za juu na milima, miombo na misitu ya vichaka vikavu.

Ninakula nini?

Zaidi majani, matunda na mbegu, lakini pia magome, nazi, na wadudu.

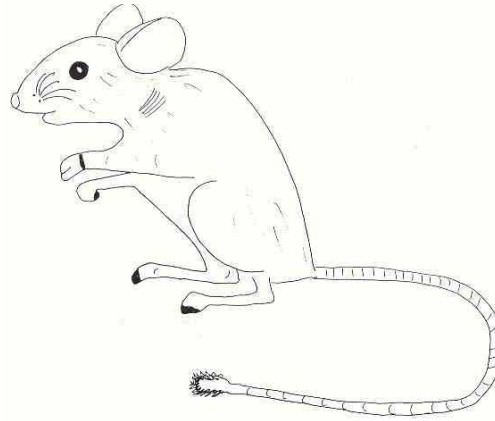
Nina mlilo gani wa sauti?

Ukweli zaidi

Ninaishi katika makundi, tunakaa katika misitu au miombo na hatuwezi kukatisha enco la wazi bila kusita. Kwa maana hii 'sisi tunatokana na misitu' au 'sisi tunategemea misitu' na hivyo tunahitaji misitu ili kuweza kuendelea kuishi.

MAELEZO YA TISA

Panya wa Afrika



Mimi ni nani?

Mimi ni Panya wa Afrika

Nina ukubwa gani?

Mimi ni mdogo sana. Ukubwa wangu ni sentimita 10 kutoka kichwani hadi mkiani. Urefu wa mkia wangu ni sentimita 13.

Ninaishi wapi?

Ninaishi msituni. Ninatengeneza kiota changu kwa majani makavu kwenge mashimo ya miti.

Ninakula nini?

Ninakula mbegu, majanina maotea wakati mwingine wadudu pia. Ninakula matunda yapatikanago msituni.

Ninakuwa macho wakati gani?

Ninakuwa macho usiku tu na nina lala mchana.

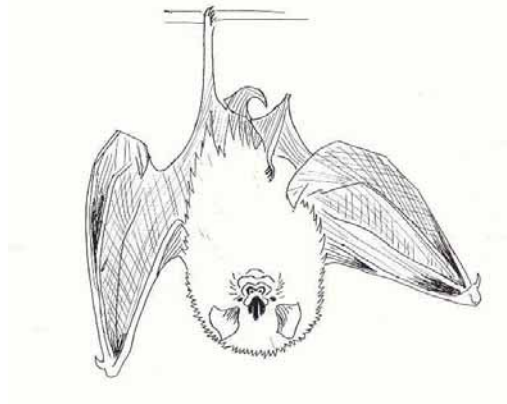
Nina mlio wa sauti gani?

Ukweli zaidi

Ninazaa watoto kati ya 1-5 wasio na manyoya, rangi ya hudhurungi na wasioona. Watoto kukuwa haraka sana na kuachana na mama yao majuma manne baada ya kuzaliwa.

MAELEZO YA KUMI

Popo



Mimi ni nani?

Mimi ni popo

Ninaishi wapi?

Ninaishi katika maeneo ya misitu na miombo katika Afrika yote isipokuwa Jangwa la Sahara. Ninaishi katika matundu ya miti, mapango na majengo.

Je, ninakula nini?

Ninakula wadudu, kumbikumbi na mchwa

Je, naweza kuonekawa wakati gani?

Ninaweza kuonekana nikiruka angani nyakati za usiku tu, hasa machweo na alfajiri (mawio).

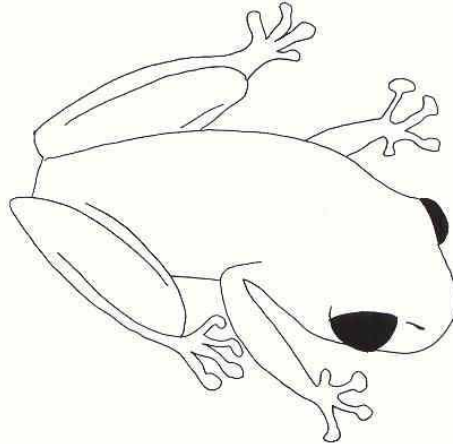
Je, nina mlilo gani wa sauti?

Ukweli zaidi

Ninatoa sauti hizi kupitia pua yangu kubwa na siyo mdomo. Sauti hizi zina nisaidia nisigonge vitu kwenye giza. Mimi siyo ndege, ni mnyama kama wanyama wengine (kama vile Panya)

MAELEZO YA KUMI NA MOJA

Chura wa miti ya Usambara



Mimi ni nani?

Mimi ni chura wa miti ya Usambara. Kuna aina nyingi tofauti za vyura wa miti. Baadhi yetu tunapatikana tu katika safu ya milima ya ukanda wa mashariki ya Tanzania. Hii inatufanya tuwe wa maaana zaidi.

Ninaishi wapi?

Kama jina langu lisemavyo, ninaishi katika miti. Ninategemea misitu kuendelea kuishi. Pia ninahitaji maji kuweza kuishi na kutaga mayai.

Je, ninaonekana je?

Mimi ni chura mkubwa (sm 8.5) na mimi nina rangi ya kijani kibichi na bluu.

Na ninapatikana Usambara mashariki na mdogo zaidi.

Je, nima sauti ya namna gani?

Kwanini msitu wako ni muhimu kwetu?

Kwanza tunapatikana tu katika misitu ya ukanda wa milima ya mashariki. Tungekufa endapo msitu ungeharibiwa.

MAELEZO YA KUMI NA MBILI

Bundi wa Usambara



Mimi ni nani?

Mimi ni bundi wa Usambara.

Ninaishi wapi?

Kama jina langu linavyosema, mimi ninapatikana tu katika milima ya Usambara. Hii ina maana kwamba ninategemea misitu hii kuendelea kuishi.

Je, nina amka wakati gani?

Ninaa mka usiku ili kuwinda. Huwezi kuniona wakati wa mchana kwa sababu nitakuwa nimelala juu ya mti.

Je, ninafananaje?

Mimi ni ndege mzuri mwenye rangi nyekundu/hudhurungi kwenye mbawa na tumbo la rangi ya maziwa

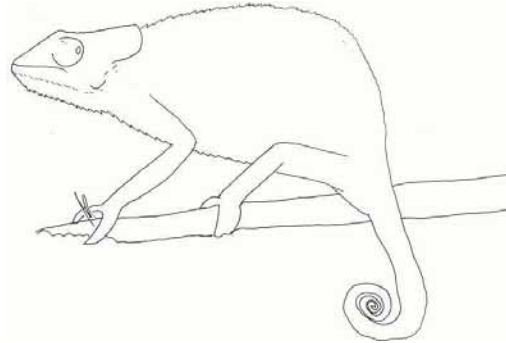
Nina sauti gani?

Kwa nini misitu ni muhimu kwangu?

Kwa sababu mimi ninapatikana katika Usambara pekee, ninategemea misitu hii kuishi. Kama misitu ungeharibiwa nisingekuwa na mahali pa - kuishi.

MAELEZO YA KUMI NA TATU

Kinyonga



Mimi ni nani?

Mimi ni kinyonga shingo bapa(Flap-necked).

Ninapatikana wapi?

Ninaishi katika misitu ya mashariki na kusini mwa Afrika ikijumisha milima ya Usambara.

Je, ninakula nini?

Nina penda aina nyingi tofauti za wadudu kama vile panzi,inzi,buibui na vipepeo

Ninaonekana je?

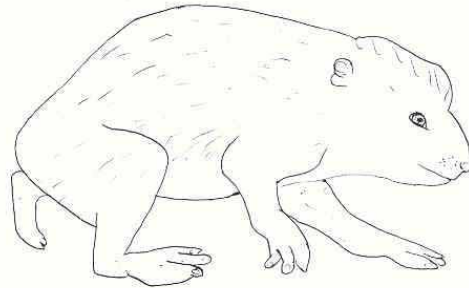
Nina rangi ya kijani kinachong'aa na hukua mpaka urefu wa sentimeta 38. Nina sehemu kubwa (flap) inayojitokeza nyuma ya shingo yangu ambayo ninaweza kuitanua kama tembo anavyo piga piga masikio yake. Hili ni onyo kwa wanyama ambao wanaweza kutaka kunila mimi

Ukweli zaidi

Naweza kuzungusha macho yangu sehemu zote. Hii inanisaidia mimi kuona hatari na wawindaji (wanyama) kwa haraka (kama nyoka). Si sawa na baadhi ya vinyonga wengine, ninataga mayai. Wakati nikiangua mkia wangu unakuwa mrefu kama mwili wangu.

MAELEZO YA KUMI NA NNE

Pelele wa mtini



Mimi ni nani?

Mimi ni pelele wa miti. Mimi ni mnyama mdogo mwenye ngozi nyororo na sina mkia.

Nina ukubwa gani?

Mimi ni saizi ya kati, kati ya sentimita 30 hadi 60 kwa urefu.

Nina ishi wapi?

Ninaishi katika msitu na maeneo ya miombo hapa Tanzania. Nina tumia muda wangu hasa juu ya miti na wakati mwingine ninalala huko.

Nina amka wakati gani?

Mimi ni makini wakati wa usiku na mchana sioni.

Nina kula nini?

Ninakula majani, matunda, na matawi machanga juu ya miti. Wakati mwingine ninakula majani na mimea ardhini.

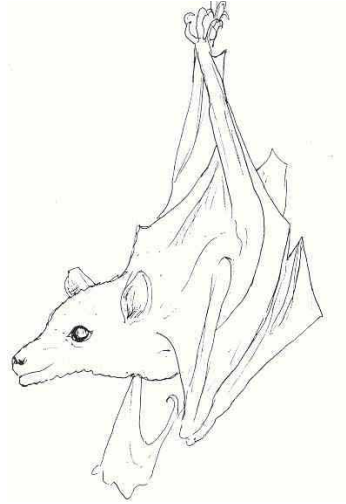
Ninatoa sauti gani?

Kwanini msitu ni mhimu kwangu?

Pelele wa mtini anapatikana tu katika milima ya Usambara, Upare, na Uluguru. Tunategemea misitu kuishi.

MAELEZO YA KUMI NA TANO

Popo wa matunda



Mimi ni nani?

Mimi ni popo wa matunda. Nina macho makubwa ya ugoro, na masikio yenye umbo la jagi.

Nina ishi wapi?

Ninapatikana Afrika nzima na pia bara la Asia na Australia. Nina ishi kwenye kundi kubwa na tunalala pamoja kwenye mapango au mitini.

Ninaamka wakati gani?

Nina amka wakati wa saa za usiku. Ninaweza kuonekana nikipaa au nikila kabla ya giza nene.

Ninakula nini?

Nina kula matunda, nta na maua ya miti.

Ninatoa sauti gani?

Ukweli mwingine

Kuna aina nyingi ya popo wa matunda wanaoishi katika sehemu hii ya Tanzania. Tunategemea msitu kuninginia na kula.