

TESSA

Teacher Education in Sub-Saharan Africa

Teaching Pack No.1

Early Primary

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Section 2	Numeracy:	Learning Through Games
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Literacy: Introducing Students to Reading and Writing

1. Beginning to read and write
2. Finding print materials all around you
3. Reading signs

Key question for the teacher:

How can you support students learning to read and write?

Keywords: early literacy; songs; rhymes; assessment; group work; shared reading

Learning Outcomes for Teachers:

By the end of this section, you will have:

- used songs and rhymes to teach beginners to read;
- used 'environmental print' and grocery packaging to teach reading, writing and design;
- explored ways of supporting learning with group work;
- developed your ability to assess learning.

Overview

What should a successful reader and writer know and be able to do? As a teacher, you need to be able to answer this question so that you can guide your students. Learning to read and write successfully takes practice. Therefore, it is important to use a variety of approaches and activities that will keep students interested. It is also important to assess students' progress and to ask yourself whether you are meeting their needs. This section of the Teachers' Pack explores these ideas as it looks at early literacy.



1 Beginning to read and write

Learning to read and write is hard work! Because you want students to look forward to reading and writing lessons, it is very important that you make your classroom – and the activities that support learning to read and write – as stimulating as possible.

What successful readers and writers need to know explains that students need to learn how to connect sounds and letters, letters and words, words and sentences. Songs and rhymes that students know well – and to which they can perform actions – help them to make these connections. So does shared reading, in which you read a large-print storybook with pictures, to your students. While you are reading, stop to show them each picture and to ask what they think will happen next. When you have finished, use the book for letter and word recognition activities in which you ask individual students to point to and read particular letters and words. Remember to give students plenty of opportunities to talk about the story – the characters, what happened, how they feel about the story, etc.

What successful readers and writers need to know

The language in which they are expected to read and write

If students have to learn to read and write in a language that is not their home language, this makes the task much more difficult. In this situation, teachers need to start with oral work and vocabulary building in this additional language, using actions and pictures. Only when students have some oral understanding of the additional language can they be expected to use it for reading and writing.

The written code

Students need to understand how the letters on the page represent particular sounds and how they combine to communicate meaning in the form of words. This is why it is important for teachers to give some attention to 'phonics' – the letters that represent particular sounds – when working with beginner readers. To take an example from English, as a teacher you could use a picture of a dog, with the separate letters d o g and then the word dog underneath it. First ask students what they see in the picture (a dog), then point to each letter and pronounce it; then pronounce the whole word. Then check students' understanding by pointing to the separate letters and asking them to make each sound. Next, ask them to tell you other words beginning with the d sound. Also give them some examples of your own.

The rules of writing

Students need to understand how words combine to make meaning in sentences, paragraphs and longer texts (e.g. a whole storybook) and how texts are written in different ways for different purposes (e.g. a recipe for cooking a meal is written differently from a story). In the early years, students begin learning about how writing is organised, but this is something that they learn more about all the way through their studies. Students need to work with whole texts so that they can see how words



connect with one another and how a story or an argument develops. This is why phonics work alone is not sufficient.

How to read drawings, photographs and diagrams and how to make connections between these visual images and written words

Students need to be taught to notice details in drawings, photographs and diagrams. You can help them by asking questions such as ‘What is the old man holding?’ ‘What does the hippopotamus have on his back?’

About the world and how it works

The more that teachers help students to expand their general knowledge of the world and how it works, the easier it is for students to read about what is new and unfamiliar because they can make connections between what they have already experienced or learned and this new information.

Above all, it is important that students enjoy reading and writing – even when they find it challenging.

Teaching Example 1

Mrs Nomsa Dlamini teaches students to read and write in isiZulu in her Grade 1 class in Nkandla, South Africa. Nomsa reads storybooks to them, including some that she has written and illustrated herself because there are few books available in isiZulu.

At the beginning of the year, she makes sure that all students understand how a book works – cover, title, illustrations, development of the story – because she knows that some of them have never held a book before starting school. She has found that prediction activities, in which students suggest what will happen next in the story, are useful and stimulating for her students.

Nomsa realises that students need a lot of practice to give them confidence in reading. She makes big print copies of Zulu rhymes or songs that they know well and also ones that she knows are particularly useful for teaching letter-sound recognition. Students say or sing them and perform actions to them. Most importantly, she asks individual students to point out and read letters and words. Some students find this difficult so she notes their names and the letters or words they have trouble with. She prepares cards with pictures, letters and words to use in different ways with these students, either individually or in small groups, while the rest of the class are doing other activities. Nomsa is pleased to find that this helps the confidence and progress of these students.



Activity 1

Ask students to:

- choose a favourite song/rhyme;
- sing/say it;
- watch carefully, while you say the words as you write them on your chalkboard (or a big piece of paper/cardboard so you can use it again);
- read the song/rhyme with you (do this several times);
- point out (individually) particular letters or words or punctuation (capital letters, full stops, question marks);
- decide on actions to do while singing the song/saying the rhyme;
- perform these actions while singing the song/saying the rhyme again;
- sit in groups of four and take turns reading the song/rhyme to each other.

Move round the class, noting students who find reading difficult.

End by asking the whole class to sing the song/say the rhyme, with actions, again.

Here are some examples of songs and rhymes:

Example of a Luganda song with an English translation

This is a lullaby – a song sung to help children to stop crying. Notice the frequent repetition of the same letters and sounds – particularly in the Luganda version.

Luganda	English
Mwana wa nnyabo, weesirikire Kye nnaalyako nja kuterekera	My dear mother's child, keep quiet I will keep for you whatever I will happen to eat

Mwana wa nnyabo

Traditional Ugandan

Voice

Mwa-na wa nny-a - bo, wee-si - ri - ki - re; Kye-rnaa - lya - ko -

nja ku-te-re-ke - ra; Baa baa, a - ka - li - ga, kaa - nywa taa - ba; Baa,

baa, a - ka - li - ga, kaa - nywa taa - ba.

Source: A traditional lullaby from Buganda – central Uganda – as collected by music teacher Robinah Nazziwa



A rhyme in English that is fun to say quickly**Yellow butter by Mary Ann Hoberman**

Yellow butter purple jelly red jam black bread

Spread it thick

Say it quick

Yellow butter purple jelly red jam black bread

Spread it thicker

Say it quicker

Yellow butter purple jelly red jam black bread

Now repeat it

While you eat it

Yellow butter purple jelly red jam black bread

Don't talk with your mouth full!

An action rhyme

I'm a little teapot, short and stout

Here is my handle, here is my spout

When I get my steam up

Then I shout

Tip me over

Pour me out.

Song of the animal world – a song from the Congo

Note: This song is about movement and the sounds of the chorus represent the movement of the creatures.

NARRATOR: The fish goes

CHORUS: Hip!

NARRATOR: The bird goes

CHORUS: Viss!

NARRATOR: The monkey goes

CHORUS: Gnan!

FISH: I start to left,

I twist to the right.

I am the fish

That slips through the water,

That slides,

That twists,

That leaps!

NARRATOR: Everything lives,



Everything dances,
Everything sings.
CHORUS: Hip!
Viss!
Gnan!

BIRD: The bird flies away,
Flies, flies, flies,
Goes, returns, passes,
Climbs, floats, swoops.
I am the bird!

NARRATOR: Everything lives,
Everything dances,
Everything sings.
CHORUS: Hip!
Viss!
Gnan!

MONKEY: The monkey! From branch
to branch
Runs, hops, jumps,
With his wife and baby,
Mouth stuffed full, tail in air,
Here's the monkey!
Here's the monkey!

NARRATOR: Everything lives,
Everything dances,
Everything sings.
CHORUS: Hip!
Viss!
Gnan!

Original sources:

Yellow butter – Traditional rhymes/songs; *New Successful English, Grade 6, Reading Book*,
Oxford University Press

Song of the animal world – Traditional song from the Congo, *African Poetry for Schools*,
Longman



2 Finding Print Materials All Around you

Some students grow up in homes that are rich in print and visual images: grocery boxes, packets and tins, books for children and adults, newspapers, magazines and even computers. Others have few of these items in their homes. Your challenge as a teacher is to provide a print-rich environment in your classroom. One way of doing this is to collect free materials wherever possible. Packaging materials (cardboard boxes, packets and tins) often have a great deal of writing on them and even very young students often recognise key words for widely used grocery items. For more experienced readers, magazines and newspapers that community members have finished with can be used for many classroom activities.

This part explores ways to use such print to support learning to read.

Teaching Example 2

Mrs Bakoru teaches English to 54 Primary 4 students in Koboko, Arua District. They are not very familiar with English but they recognise letters and some English words on grocery packaging.

Mrs Bakoru asked her neighbours for empty boxes, packets and tins. She brought these to school to use for reading and writing activities.

The packets you collect for your students could be in a local language - what ever language is being used to teach the students.

Her students' favourite game is 'word detective'. Mrs Bakoru organised the class into nine groups of five and gave each group the same box, packet or tin. She asked students to write down numbers from 1 to 5 and then asked five questions. Students compared individual answers and decided on a group answer. Mrs Bakoru discussed the answers with the whole class. The 'winner' was the group that finished first with most correct answers.

Sometimes Mrs Bakoru invited each group to ask a word detective question.

To encourage students to think critically, she sometimes asked questions about the design of the packaging and the messages in the advertising.

Mrs Bakoru noticed that some students didn't participate, so the next time they played, she asked every student to write down four words from the grocery 'container' before they returned to their usual seats. Back at their seats she asked each one to read their list to a partner. She discovered six students who needed extra help and worked with them after school for an hour, using the same grocery items and giving time to practise identifying letters and words.

Mrs Bakoru realised becoming familiar with letters and words on packages helps students to identify these letters and words in other texts they read, such as stories. By copying words from packages, students also learn to write letters and words more confidently and accurately.



Activity 2

Bring to class enough tins, packets or boxes for each group of four or five students to have one item to work with or ask your class to help you collect these items.

Write questions on the chalkboard about the words and images on the packet, tin or box. Either ask your students to read them or do it for them. Here are some examples:

1. What is in this tin/packet/box?
2. How do you know this?
3. Which word or words are in the biggest letters?
4. Why do you think this word or these words are in the biggest letters?
5. How many words begin with capital letters?
6. Which words are written more than once on the package?
7. Which word is used the most?
8. What is the weight of this product (grammes/kilogrammes)?
9. What do all the words and pictures tell you about this product?

Either play the word detective game in groups (see **Teaching Example 2**) or ask students to write individual answers, which you assess. Arrange to give extra practice time and support to students who could not manage this activity.

In the next lesson, ask students to work in the same groups to design the print and visual information for the packaging of a real or imaginary grocery item.

Ask each group to display and talk about their design to the rest of the class.

What have students learned by reading the packages of grocery items and by designing and displaying their own? Compare your ideas with the following suggestions.

What students could learn from working with grocery packaging

1. Beginner readers could use the words on the grocery package to gain confidence and skill in recognising the shape of upper and lower case (capital and small) letters of the alphabet and in linking the letter shapes to sounds.
2. By copying letters and words from the packaging, beginner writers could gain confidence and skill in writing these letters and words accurately.
3. More advanced readers could read the 'messages' on the packaging and think about what these mean. They could begin to become critical readers.
4. By working in groups to design some grocery packaging, students could benefit from each other's ideas, learn what is involved in package design, use their imaginations and practise some writing and reading.
5. Some students find it difficult to speak to the class because they don't know what to talk about. Having a design for a package to explain to the class gives students a subject to speak about.
6. Each group's design gives the rest of the class some additional material to read.



7. You could make reading cards with letters/words that some students found difficult to read. Put a helpful picture on each card. Use these for individual or small group reading practice with these students at a suitable time.
-

3 Reading Signs

Reading and writing can be very exciting and stimulating, but some students develop a negative attitude to these activities. This might be because they find reading and writing very difficult, perhaps because they are bored by reading and writing tasks that always follow the same pattern, or perhaps they don't see much value in reading and writing. One of your challenges as a teacher is to stimulate students' interest in reading and writing and keep them interested.

Teaching Example 3 suggests activities that may help students to become more interested and confident in reading and writing.

Teaching Example 3

Mr Sam Kawanga teaches English to a Primary 5 class in St John Primary School, Kampala. The area around Kampala is a densely populated area with many examples of environmental print outside the school – mainly in English but also in several local languages.

To generate income, people have set up 'backyard businesses' such as grocery shops, barber shops, panel beaters and phone booths. These all have homemade signs and some also have commercial advertisements for various products. There are schools, clinics, places of worship and halls, most of which have signs and noticeboards. On the main road, there are signs to many places, including the respected Makerere University.

Mr Kawanga planned a route around Kampala that would give students opportunities to read and make notes and drawings about different examples of print and visual images. He also prepared a list of questions to guide their observations.

Mr Kawanga has 58 students in his class, including ten who have recently arrived from Tanzania. He decided to ask two retired multilingual friends to assist him with this activity. One speaks Kiswahili, the language of the Tanzanian students. The class went out in three groups.

Mr Kawanga's friends participated in the classroom discussion and the writing and drawing activity that followed. By the end of the week, the three men agreed that students had become more aware of how information can be presented in different ways and in different languages and some seemed more interested in reading and writing than before.



Activity 3

Before the lesson, read the following to plan the walk and prepare your questions. Write the questions on the chalkboard.

Preparing for a community walk

Step 1: If your class is very large, you could ask some adults from the community to help you in walking with groups of students. If you do this, meet with these adults before the walk to explain what you would like them to do. They should know what questions you will be asking students and what examples of environmental print you want students to notice. They may also have some suggestions to give you.

Step 2: Plan the activity by walking through the area around your school. For some of you this may be a village, for others part of a busy city. (Note: If your school is in a very isolated place, you may need to work with community members to arrange transport for students to a place where they can see a range of environmental print.) Notice every example of environmental print you can draw students' attention to and plan a route for you and the students to walk. The kinds of print and visual images will, of course, vary greatly from one neighbourhood to another but may include names (e.g. school, clinic, mosque, church, community hall, shop, river, street); signs (e.g. a STOP sign); advertisements on billboards or the walls of shops; community notices (e.g. election posters or notices about meetings or social or sports events).

Step 3: Prepare a list of questions for students to answer. These could include:

- What does this sign or name tell us?
- Why do you think it has been placed here?
- What language is it written in?
- Why do you think it has been written in this language?
- What information do you get from the drawings or photographs that you see?
- Which signs are easy to read? Why?
- Which signs do you like? Why?
- How could you improve some of the signs?
- What other names, signs, advertisements, posters, notices would you like to have in this neighbourhood? Why would you like to have these?

To begin the lesson, tell students about the walk and, if they are able, ask them to copy the questions from your chalkboard. If not, have the list of questions ready for each group leader to ask on the walk.

Take them for the planned walk through your local community.

While walking, they must give or write answers to the questions and draw examples of the print and visual images they see.



Afterwards, ask students in groups to share what they saw, wrote and drew. Ask the whole class to report back and record key points on the chalkboard.

Ask each group to design, write and draw a name, sign, notice or advertisement they think would be helpful to have in their community. Help them with any difficult words. The children may need to work in small groups with an adult to help them.

Ask each group to show their design to the whole class and explain the choice of language, visual images and information.

Display these designs in the classroom for all students to read.



Numeracy: Learning Through Games

- 1 Playing number games
- 2 Helping number recognition
- 3 Cultural games

Key question for the teacher:

How can games help students learn basic number skills?

Keywords: games; group work; investigation; number skills

Learning Outcomes for the Teacher

By the end of this section, you will have:

- developed ways to use games to raise interest in mathematics;
- used a range of games to help enhance mathematical understanding and number skills.

Overview

Using games in your classroom can enhance your students' mathematical understanding and skills. These games can range from mental arithmetic games played with the whole class to more complex board games.

This section explores how games provide a cooperative way to stimulate interest and thinking about numbers.

By using local cultural games you help relate mathematics to students' everyday lives.



1 Playing Number Games

Using games to motivate all students, even those who are sometimes reluctant in mathematics lessons, can have very positive effects.

Children are able to practise mental calculations and other skills while enjoying playing games.

You should always practise each game yourself before introducing it to students. This will ensure you understand it and can explain it clearly; it will also help you to identify the mathematical thinking needed to play the game. You can make the games yourself or with your class and they can be used again and again.

Teaching Example 1

Miss Isah, a Primary 2 teacher in Nigeria, found that her students enjoyed playing number games at break time. The boys rolled balls through numbered arches on a table and the girls tossed beanbags onto a target. In each game the winner was the first student to score 20 points, and Miss Isah noticed how some of her students were better than others at adding scores together.

She decided to introduce similar games into her teaching to find out if all her students could add up. She used the same game each day with one group at a time for a week. The rest of the class worked on practice exercises and she divided her time between supporting those playing and the rest of the class. See Using group work in the classroom in the Teaching Pack Additional Resources.

She found that there was a small group of students who were less sure of adding numbers mentally and she gave these students extra opportunities to play and planned other mental arithmetic sessions for them.

Miss Isah also found that her students were more eager to come to class and she decided to use more games in her class in future.

Activity 1

You should play any games yourself first, so you know the rules and can explain them clearly to your class.

This game enables your students to practise their simple number bonds and use their observational and memory skills. If you have older students you could adapt this game using other numbers and sums. See the following example of a number adding game for how to play, and ways to adapt the game.



Number bond games

Here are the instructions for the question and answer match game. Below are some examples of questions and answers. You could either copy these or ask your students to draw the squares themselves.

1. Cut up each square separately.
2. 2–6 players can play this game at any one time.
3. Place all the cards face down on the table. Keep the answers and questions separate to help the players.
4. Decide who goes first. Each player takes it in turn to turn over two cards – one from the sums first and then one from the answers. If the answer is right for the sum the player calls the first 'match'. If they get a match, they can have another go. If not, the next player has their turn and does the same. Carry on in this way until all the sums are answered. The winner is the one who has most matches.
5. You could make this more challenging for older students by using more difficult sums, which include subtraction, multiplication or division. You will have to adapt the 'answers'

Examples of Questions				Examples of Answers			
1+0=	0+2=	1+1=	2+0=	1	2	2	2
1+2=	2+1=	0+4=	1+3=	3	3	4	4
3+1=	2+2=	0+5=	4+1=	4	4	5	5
1+4=	2+3=	3+2=	0+6=	5	5	5	6
1+5=	5+1=	2+4=	4+2=	6	6	6	6
3+3=	0+7=	1+6=	2+5=	6	7	7	7
5+2=	3+4=	4+3=	8+0=	7	7	7	8
1+7=	2+6=	6+2=	3+5=	8	8	8	8
4+4=	0+9=	8+1=	2+7=	8	9	9	9
3+6=	4+6=	7+3=	9+1=	1	2	2	2

You will need to make several copies of the game or you could involve students to help you make their own copies.

- Organise your students into groups of five or six, and provide each group with a game.
- Encourage groups to talk to one another about the game and the rules.
- Each group selects a leader who makes sure the game is played fairly.
- As the students are playing, go around the class observing anyone having problems so you can plan ways to help later.

Ask yourself:

- What number skills are students practising as they play these games?

Questions you may wish to consider or discuss with a colleague:



- Did the students enjoy the games? How do you know they enjoyed them? Look for other examples in other subject areas.
 - Did all the students participate? If not, how could you ensure everyone takes part?
 - Did you feel that you were in control of the whole class?
 - How could you improve this lesson? Would smaller groups be better?
 - Did you give the students enough time for their tasks?
-

2 Helping Number Recognition

Games can be played in small groups or as a class. Playing with the whole class needs preparation and adequate resources. Allowing games to be played at times other than class time will encourage more learning and help to consolidate ideas. Setting up a games club in your school may also encourage more students to play.

Teaching Example 2

Lucy played Bingo with her Grade 2 class because she thought it was a great game to help students recognise two-digit numbers.

She played the game with the whole class first. She gave each student a card and some buttons. A student drew cards, numbered 10 to 50, from a box and read them to the class. If a student found the number read out on their card, they placed a button over it. The first student who had buttons covering a row, column, or diagonal correctly won the game. As the students played the game, Lucy went around the class helping. The successful completion of a row, column, or diagonal is evidence of the ability to recognise two-digit numbers correctly.

Next, she divided the class into groups of eight and they played the game at their own pace, taking it in turns to be the caller.

Lucy also allowed students to play Bingo at break and she was surprised how many students played, especially on a wet day. She also noticed how much more confident they became in mathematics classes. She extended the game by putting more cards into the game using numbers 51–99 for her more able students.

Activity 2

In this activity, ask your students to play one of four games described below and identify any mathematics they think they are learning. You may need to help them identify the mathematics

- Organise your students into groups of four or five.
- Provide each group with one of the four number games.



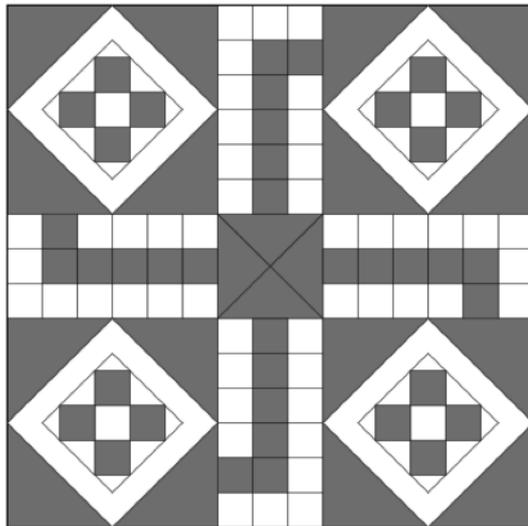
- Ask each group to discuss the game, checking they understand the rules before playing.
- After playing each game for a set time, ask groups to list what mathematics they think they have practised using the following table.

Games to practise numeracy skills

Ludo

A simple children's board game for two to four players, in which the players race their four tokens from start to finish according to the way the dice falls.

Players take it in turns to throw the dice and move their tokens round the board. When a player throws a 6 they have the option to start to move another token around the board. If a player's token lands on a space that is already occupied by another player's token, that player has to remove their token from the board and wait until they have thrown a 6 to start again. The winner is the first player to get their four tokens to the centre of the board landing on their matching coloured area.



Bingo

This is a game of chance where randomly selected numbers are drawn on a bingo card which includes blank squares. One example is below:

5				49		63	75	80
		28	34		52	66	77	
6	11				59	69		82

One person, 'the caller', writes the numbers 1–100 usually on small balls (but you could use cards). The caller then selects these one by one without looking and calls the numbers out. If the player can match that number they cover the number on their card with a counter, or cross it off. It is important that the caller remembers to keep the numbers that have already been called separate, as they will need them later for checking. The caller selects and then calls until one person has covered all the numbers on their card and shouts out '**BINGO!**'. The caller needs to check their card is correct and declares the person the winner.

A loop card game

'Loop card' games keep students 'on their toes' and listening, as all are involved and they do not know when their card will come up.

Instructions

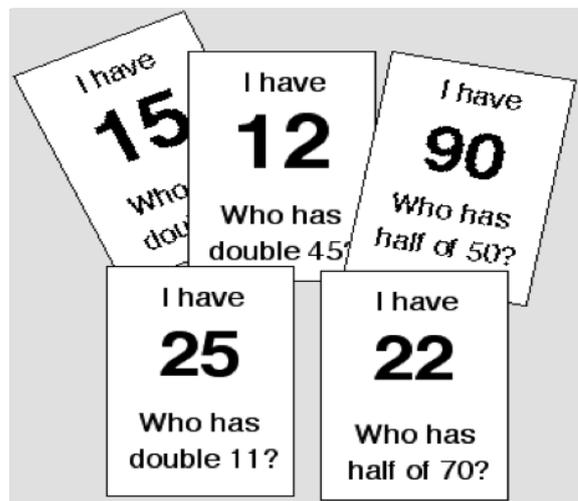
Each card has a number such as 12 (or any other number) and a question. The question can simply be about adding or multiplying numbers, or could involve all four rules of number depending on what you want the students to practise. You can therefore make different sets of these cards, easy and hard, to use at different times. For example, some cards could help students who have particular problems with larger numbers. The examples in the picture below are about halving and doubling.

You need enough cards for each student to have one card. You could also make cards using money, distance etc. as a topic.

To play the game, the students could sit at their desks or you could organise them into a big circle. Give out a card to each student. Choose one student to start by reading out their question. The child who has the correct answer stands up and says the answer. If they are correct, they read their question. The child with the correct answer to this new question stands up and reads out their question and so it goes on until all the students are standing (or sitting if they all start standing up).

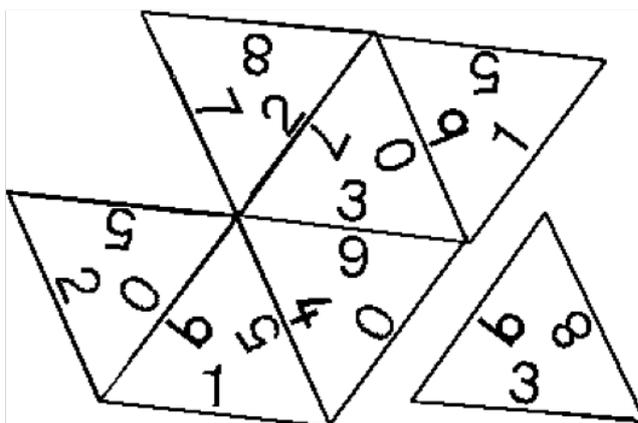


Do not have more than one card with the same number as this will confuse the students. You can use this game often as your students will get different cards each time. It is a good activity to use at the end of a lesson when all other work is finished, and is good practice for their mental mathematics skills.



The triangle number game

The triangle number game is the most versatile mathematics game for primary children. The game is played much like dominoes, where numbers are matched to each other to make a pattern. Two sides of the triangles are put together according to a chosen rule. In the example below, the 'rule' is that the two numbers must add up to 9.



For older students, the winner is the one to finish their cards first, but younger children usually play cooperatively. The game is best with 2–4 players, although it can be used by one as a 'patience'.

Some of these examples have been adapted from <http://homepages.which.net/~jenny.murray/games.htm>

If you can, visit the website to get other ideas and examples.



Table to record numeracy skills

Tick the mathematics practised by each game; for example, game 1 helps addition.

	Game 1	Game 2	Game 3	Game 4	Game 5
Number					
Addition	x				
Subtraction					
Multiplication					
Division					
Making Sets					

- You may then want groups to try one of the other games. If you have time, you could continue until each group has played all four games (rotating different activities like this is sometimes called a 'circuit'; using a circuit approach allows one set of equipment, in this case a particular game, to be used by the whole class).
- Pin all the results on the wall so that they can be discussed.

You may have to let them play over more than one lesson or let them play during break times.

3 Cultural games

Playing cultural games is another way of motivating students. This helps them see that mathematics is a popular, universal and historical activity. There is a very popular game played all over Africa, which has a variety of names.

There are many versions of this game, described in detail in the next activity. It involves important mathematical skills and can be played by students of different ages.

Understanding how games can be adapted for use by students of different ages is important for a teacher. For example, in its simplest form, this game is suitable for younger students as it encourages counting and understanding the concept of one-to-one correspondence. As you extend the game, students learn about addition and subtraction. If you are teaching students at different levels, see Working with large and/or multigrade classes at the end of **Teachers Pack No. 1**.

Teaching Example 3

Mr Mathivha told his class about a game (the game described below) that he had played as a child. He said they would play it in their next mathematics lesson.

He showed the class the board used and demonstrated the game by asking two students to play as he explained the moves. While the class



watched, he encouraged them to ask questions.

He then gave out resources for students to play the game in pairs (four students per game) so they could talk with their partner about the moves. As they finished, he asked them to identify the number skills needed to play the game.

Finally, he gave the students permission to take the games home and play with someone there for the rest of the week.

At the end of the week, Mr Mathivha asked his class what those at home thought about the game. Many said their parents and grandparents had played the game as children.

Activity 3

Before you start, check you know the rules of the game.

The cultural game of Africa

This game has many names, for example:

- Moruba (also maruba) by the Pedi of South Africa
- Kpo by Vai people of Sierra Leone and Liberia
- Ajua by Luo in Kenya
- Omweso by Ganda of Uganda
- Bao by Swahili in East Africa
- Gambatta in Ethiopia
- Ayo by Yoruba in Nigeria
- Oware by Igbo in Nigeria
- Warri by Asante in Ghana

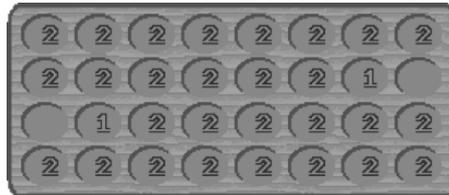


In the past, boards for playing the game have been made from beautifully carved wood, bronze (in the royal court of Benin, Nigeria) or gold (by the Asante Kings in Ghana). Now there are less elaborate versions available and you can make your own using a piece of cardboard and drawing the required number of circles.



Rules for Playing Moruba

The size of the game board depends on the number of players. Most common is a board which consists of four rows of eight holes (mekoti) each, but there are old photos which show boards that had up to 16 holes per row. The holes are dug into the earth. The counters are usually pebbles called mathlapa ('cattle').



Initial position

Each player only uses his/her side of the board, which consists of two rows.

At his/her turn, a player takes the contents of one of his/her holes, which must contain at least two stones, and distributes them, one by one, counterclockwise into consecutive holes on his/her own side.

If the last stone falls into a non-empty hole, its contents are distributed in another lap in the same direction.

The move ends when the last stone is dropped into an empty hole.

If the last stone is put into an empty hole of the inner row and the opposite hole of the opponent contains stones, these enemy stones are 'killed' (tlaba). Additionally, the stones of the outer hole directly behind it are 'captured' (tlola) and the contents of any other enemy hole. The killed or captured stones of the opponent are removed from the board.

When a player has only singletons, he/she is permitted to move them, but only in empty holes.

The player who has still stones at the end of the game is declared the winner, while the other player who has no stones left, has lost. Draws are not possible.

Original source: <http://www.wikimanqala.org/wiki/Moruba>

- Collect enough boards and 58 seeds/beans for each group.
- Divide the class into groups of four and provide each group with a board and 48 seeds/beans.
- Ask each group to identify two volunteers who will play the game.
- Let two other students help the volunteers play.
- While the game is in progress, move around the class, helping where needed. Listen to what the students are saying and write down any mathematical words they use.

Discuss with the students what you heard. What mathematical skills were they practising in the game?

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Science: Plants

1 Simple plants

2 Knowing our plants

3 Local plants

Key Question for the teacher:

How can you help students investigate local plants?

Keywords: plants; reproduction; flowers; project; nature trail

Learning Outcomes for the Teacher

By the end of this section, you will have:

- explored how to help students ask questions, observe and make deductions to develop their knowledge of local plants;
- worked with students to develop positive attitudes to how the local habitat is valued and cared for;
- planned and carried out a class project to develop a local nature trail.

Overview

How many species of plant grow locally? How many can you and your students recognise?

In this section, you work with your students to establish what they know about plants. This is your starting point for introducing new knowledge. The new knowledge will then be more likely to make sense to them and be more meaningful. The emphasis throughout this section is on practical activities, encouraging students to explore, observe carefully and investigate their own environment. This includes planning a nature trail with your students. This work will help them develop a positive attitude to their local environment, valuing and caring for the different species.



1 Simple plants

What makes plants so special? Two things. Almost all plants make their own food from water and a common gas in the air – carbon dioxide. The special green pigment, chlorophyll, traps the energy of sunlight, forming energy-rich carbohydrate. At the same time, plants release oxygen. People and animals would not exist if it were not for plants. This is why we should take plants more seriously!

A good starting point for exploring plants is to look at some of the simpler non-flowering plants. Simple plants do not have flowers, pollen or seeds; they reproduce in different ways. This group of plants includes mosses, ferns and lichen.

Do you have examples of these in your local environment?

On your usual walks, try to find examples of these different plants; this will give you ideas for questions to raise with your students. You could collect some to bring into your class.

Teaching Example 1

Mr Karume and his class in Tanzania walked round the area near their school, hunting for examples of simple plants. They found tiny mosses, green tufts growing on the bark of the shady side of tree trunks and rocks. They looked at lichen, which grew on the bark of the sunny side of tree trunks and rocks and even roofing. They found small ferns growing in cracks in the wall near the rainwater tank. They drew each plant and noted where it was growing.

When they were back in the classroom, Mr Karume asked his students to think about how these plants were able to reproduce. He displayed all their ideas on newsprint round the classroom.

To find out more, the students collected some moss and grew it under the bottom half of a clear plastic bottle. After a time, they noticed that the moss produced green, club-shaped capsules that turned brown and split, releasing tiny spores. They discussed whether these would grow into new moss.

The students then went back to observe the ferns and the lichen. They discovered that all the ferns had patches of scaly brownish spore capsules on the undersides. They kept observing the lichens, but saw no spore production. Mr Karume asked a local high school biology teacher to tell them more about lichen and how it reproduces. He was very pleased with how these activities had increased his students' awareness of these plants.

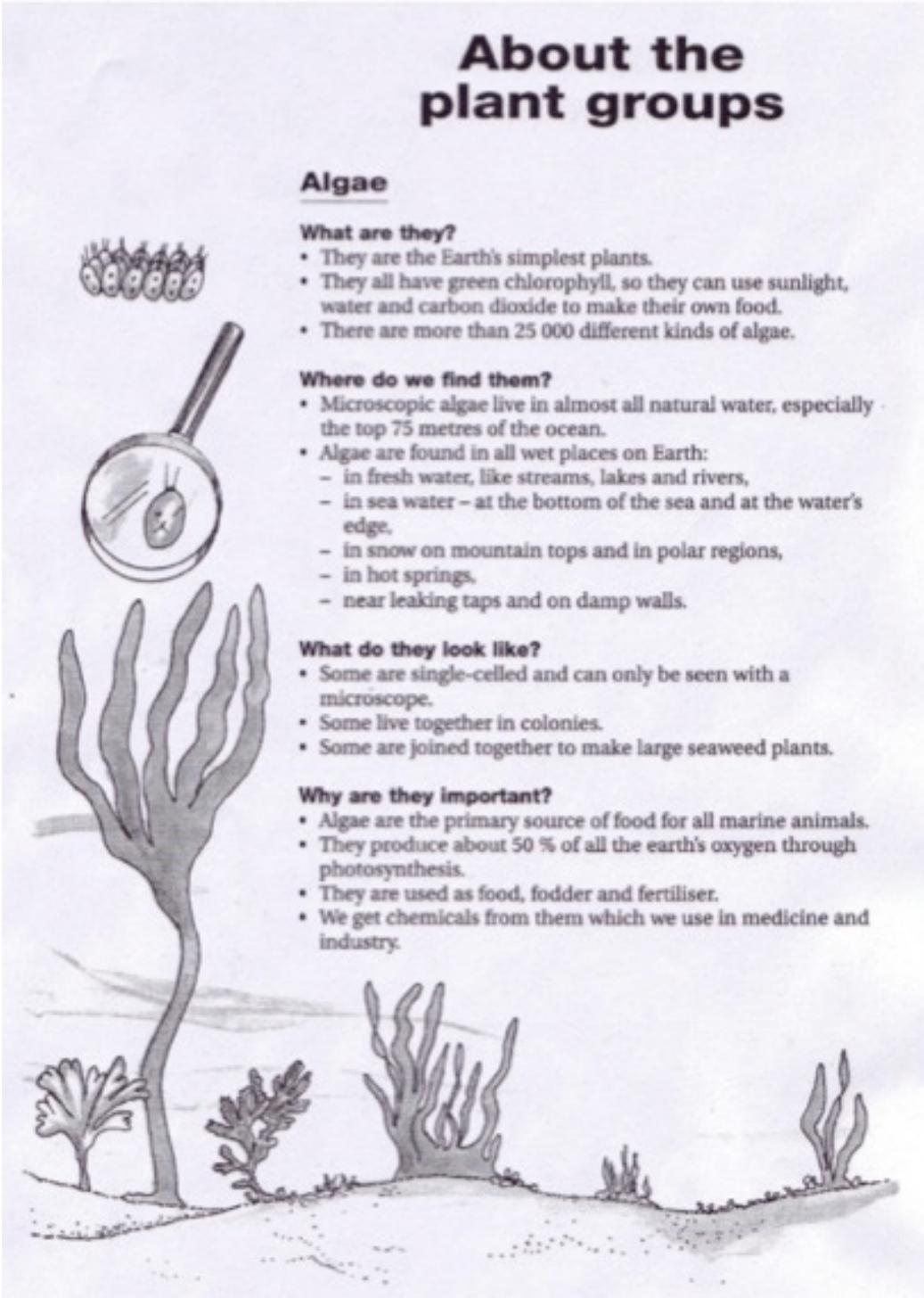


Activity 1

Here are some examples of simple plants.

About the plant groups

Algae



What are they?

- They are the Earth's simplest plants.
- They all have green chlorophyll, so they can use sunlight, water and carbon dioxide to make their own food.
- There are more than 25 000 different kinds of algae.

Where do we find them?

- Microscopic algae live in almost all natural water, especially the top 75 metres of the ocean.
- Algae are found in all wet places on Earth:
 - in fresh water, like streams, lakes and rivers,
 - in sea water - at the bottom of the sea and at the water's edge,
 - in snow on mountain tops and in polar regions,
 - in hot springs,
 - near leaking taps and on damp walls.

What do they look like?

- Some are single-celled and can only be seen with a microscope.
- Some live together in colonies.
- Some are joined together to make large seaweed plants.

Why are they important?

- Algae are the primary source of food for all marine animals.
- They produce about 50 % of all the earth's oxygen through photosynthesis.
- They are used as food, fodder and fertiliser.
- We get chemicals from them which we use in medicine and industry.

Mosses

What are they?

- Mosses are very small green plants which are about 65 million years old.
- The fossil remains of mosses look very similar to the mosses we find today.
- There are more than 20 000 different kinds of mosses.

Where do we find them?

- Mosses grow in places that are damp for long periods. We find them:
 - on damp rocks,
 - on forest floors,
 - near drainpipes, drains and gutters,
 - on the ground shaded by other plants.

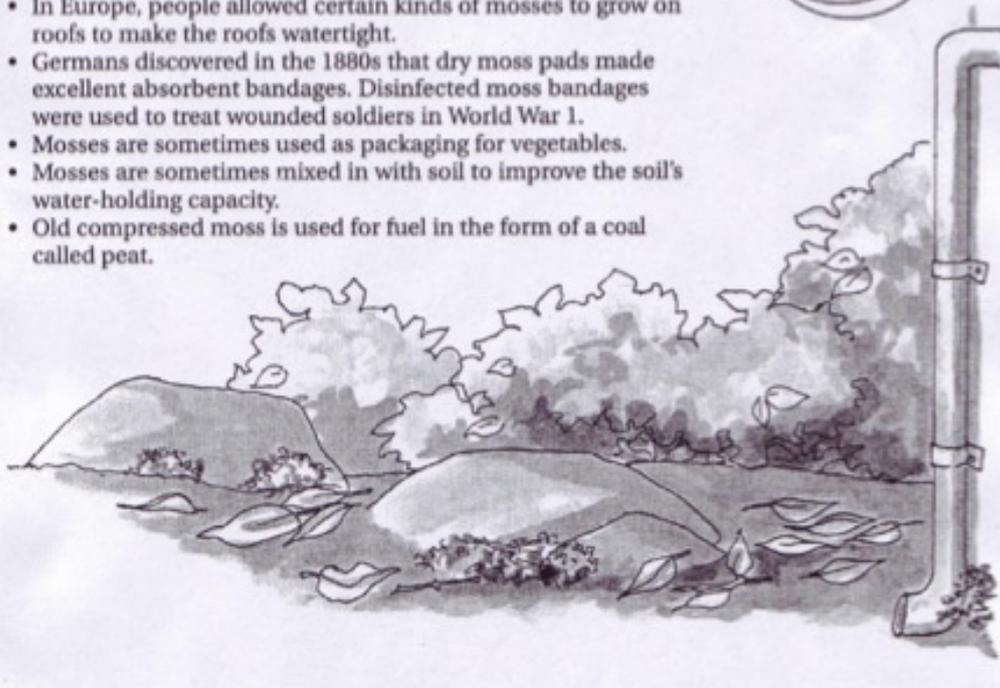
What do they look like?

- Most mosses are only a few centimetres in size.
- Some mosses look like sheets of cells, with other structures growing out of them which are used for reproduction.
- Some mosses are simply many-branched stems with leaves growing out of them.

Why are they important?

Mosses have been used for a variety of interesting purposes:

- Native Americans used to grind up dried moss into a paste which they used to treat burns.
- In Europe, people allowed certain kinds of mosses to grow on roofs to make the roofs watertight.
- Germans discovered in the 1880s that dry moss pads made excellent absorbent bandages. Disinfected moss bandages were used to treat wounded soldiers in World War 1.
- Mosses are sometimes used as packaging for vegetables.
- Mosses are sometimes mixed in with soil to improve the soil's water-holding capacity.
- Old compressed moss is used for fuel in the form of a coal called peat.



Ferns

What are they?

- Most ferns are small plants growing no more than a metre high.
- There are some ferns that grow as high as a small tree and are woody (tree ferns).
- All ferns have veins and vessels for conducting water, mineral salts and food.
- At one time in Earth's history, ferns were the most dominant type of plant.
- There are more than 10 000 different kinds of ferns.

Where do we find them?

- Ferns are land plants but they need water for reproduction.
- They grow in cool, moist, shady places, like the floor of tropical rain forests and on the banks of rivers and streams.
- They also grow in places that get lots of water at certain times of the year.

What do they look like?

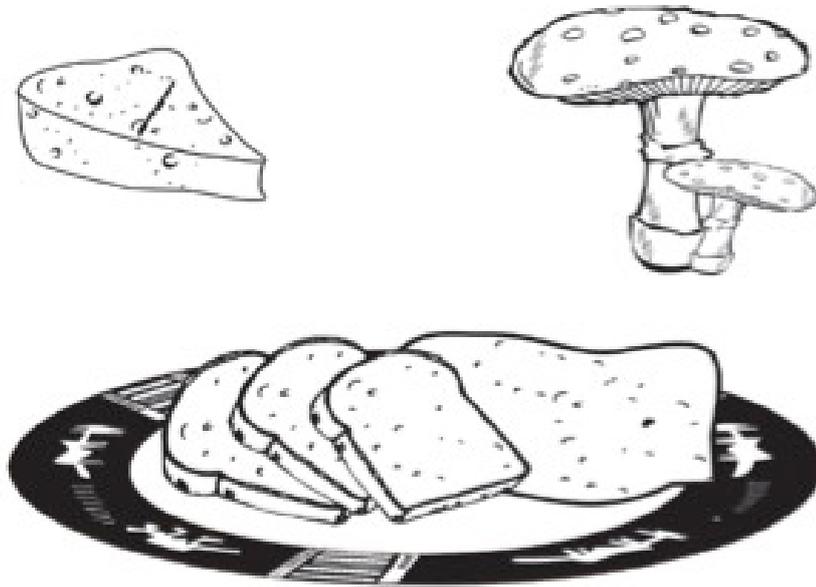
- The individual leaves of a fern together make up fronds. On the back of the fronds dots of brown sori are found. Sori contain spores, which are used in reproduction.
- The tip of a frond unrolls like a spring as the frond grows.

Why are they important?

Ferns were the dominant plants on Earth 300 million years ago. At that time Earth's climate was warm and rainy and the land was covered by shallow seas and swamps. The ferns grew throughout the year, but as they had shallow roots many ferns toppled over into the swamps. Here they rotted slowly. Eventually, over a long period of time, they became covered with rock. Over millions of years they turned into coal and oil, which we use today for fuel and other purposes.



Fungi



You could use algae or moss or ferns for this activity.

Freshwater algae are plants that make food and give off oxygen. Grow some algae in the classroom by letting some water turn green in a clear open glass (or collect some algae locally).

- Encourage students, working in small groups, to think of questions to ask about the algae. What would they like to know about it? Remind your students of the seven characteristics of living things. Does it need light to grow? Where does it come from? Why is it important? Each group of students should record each question on a piece of paper or newspaper.
- Ask each group in turn to share their questions. Display the questions in suitable clusters on the classroom wall and discuss them. Which questions could you investigate? Which do you need to look up in a book or ask an expert or use the Internet? Which might be very difficult to answer?

2 Knowing our plants

An important part of thinking scientifically is looking for patterns and organising observations. You and your students have been looking at simple plants, which reproduce without flowers, pollen or seeds. But most plants today, from the tiniest grass plants (grass has very inconspicuous flowers) to the tallest of woody trees, have flowers that make pollen and produce seeds carried in a closed ovary.

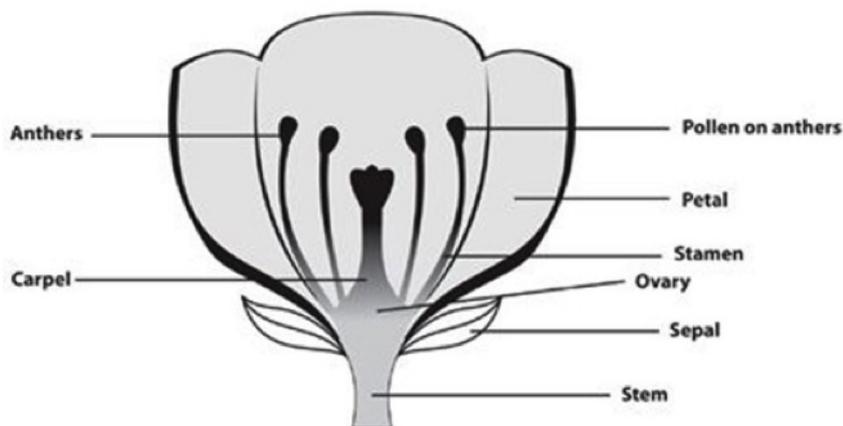
Here is a checklist for your own planning (or for use with older students) You would want to adapt the language for use with younger students.



Reproduction in flowering plants

Flowers contain the reproductive parts of a plant – they produce the seeds from which a new plant will grow. Flowering plants reproduce by two special sex cells joining together. The male sex cell (pollen) joins with the female sex cell (ovum) to become the first cell of a new organism. This cell then divides to become two, then four, then eight ... and so on until there are millions of cells in the seed. The seed then germinates and grows into a new plant.

The diagram shows the parts of a flower:



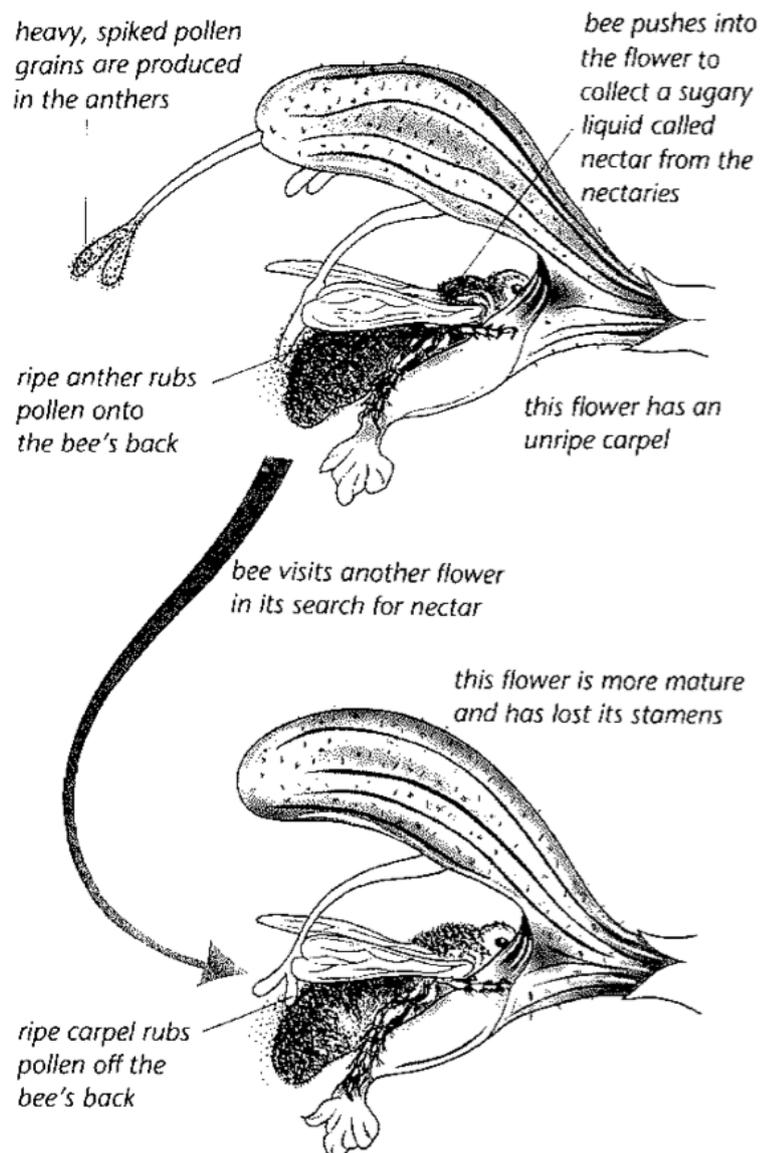
- The stamen is the male parts of the flower.
- The anthers, at the top of the stamen, contain thousands of grains of pollen.
- Each pollen grain contains a male sex cell.
- The carpel is the female part of the flower. At the bottom of the carpel is the swollen part – this is the ovary.
- The ovary contains several ovules.
- Each ovule is a female sex cell called an egg cell.
- Ovules are bigger than pollen grains – sometimes you can see them with a hand lens.
- Plants need help to get the pollen grains from the stamens to the top of the carpel of another flower of the same kind: this is cross-pollination. (Self-pollination is when this happens in the same flower.)
- In cross-pollinating plants, the stamens usually ripen to produce pollen before the carpels have fully developed so that self-pollination does not occur.
- Some plants use insects to help them pollinate. The insect, in search of food, is attracted to the flower. The pollen brushes onto the insect's body and sticks. The insect then visits another flower and some of the pollen will rub off onto the carpel of the next flower.



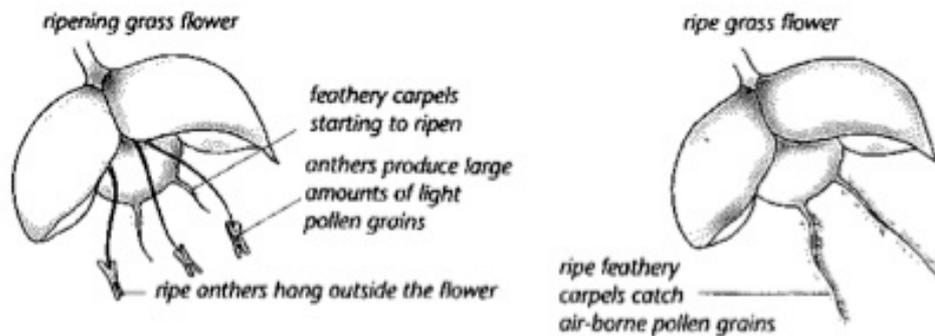
- Flowers that use insects to help them pollinate usually have brightly coloured petals, scents and large sticky pollen grains.
- Some plants use the wind to help them pollinate. These plants usually have male and female parts that hang outside the flower. They are not usually brightly coloured and their pollen grains are small and light. Grasses are pollinated in this way.
- After pollination, a tube grows out of the pollen grain and down to the ovary.
- In the ovary, the nucleus of the male sex cell joins with the nucleus of the female sex cell – this is fertilisation.
- Fertilised ovules develop into seeds and the ovary changes to become a fruit.

Examples of pollination

Insect pollination



Wind pollinated plants



In **Activity 2** you work with students to find out the common features of flowering plants and try to solve a problem – how does each plant pollinate? In this type of activity your students will be involved in speculating, sharing and reforming their ideas. It is important that you and other students listen carefully to everyone's ideas and do not dismiss what anyone says. The discussion should challenge the ideas, not the person – otherwise students will not be happy to do this kind of activity.

Following the activity, you might want to start a checklist of local flowering plants. You could use scrapbooks to keep the information for future reference, as well as drawings and pressed dried specimens. Other students in the school and parents may enjoy looking at these scrapbooks and adding their own comments.

Teaching Example 2

Mrs Ollenu set her class an activity for the holidays. She asked them to report back on the number of examples they could find of plants (alive or dead) being used to form a protective barrier in some way. A barrier keeps things in or out of a place. She told them they could also interview older people to discover what happened in the past, or find photographs in old magazines or newspapers.

The next term, students reported back on what they had found out. Mrs Ollenu was delighted with their findings and the class were very surprised at the number of different examples. They didn't just have examples of hedges and wooden fences; they also had windbreaks, creepers grown over structures to provide shade, cane screens and cotton cloth curtains. Mrs Ollenu gathered their ideas on a large poster on the classroom wall. Some students had brought in drawings, so this was a very colourful and informative display.

She used this display as the starting point for a class debate on the advantages and disadvantages of plants as barriers.



Activity 2

- Organise your class into pairs, or into groups of four if you have a large class. Ask each pair or group to find a flower that grows in your local area.
- Now ask each pair to find out everything they can about the structure and function of their chosen flower.
- Use the following instructions and questions as a guide with your students:
 - Draw the structure of the flower.
 - Label the parts of the flower. (To help them do this, you could put up a large drawing of a flower with the labels you want them to use on the chalkboard.)
 - Describe the function of each part.
 - How is the plant pollinated: Do insects visit the plant? Does the pollen hang on stamens outside the flower? Is it in a windy place?

When each pair or group is ready, they could give an oral presentation to the class covering the points above.

Here is an example of the kind of information you might ask the children to look for:

The gosenga

Here is an example of a shrub or small tree commonly known as the Gosenga, which is widespread in West Africa.

- Name: Gosenga or *Acacia dudgeoni*.
- Where found: sandy soils in open savanna (location Yendi).
- Appearance of plant, leaves, flower and fruit, or seeds: flaky, reddish coloured bark with curved spines at nodes. Light green leaves. Small flowers and dried pods.
- Uses: a gum, firewood, wood for tools.
- Animals that can be associated with the plant: goats, antelopes and horses eat the leaves and young pods; bees get pollen from the flowers.
- Interesting beliefs: bark extract sometimes used for treating diarrhoea and dysentery in children.

3 Local plants

How well do your students know the plants of the local area? Do you or your students know what plants of interest grow in the vicinity of the school? Perhaps the school should develop a list of local plants and collect information about them. This could be an interesting and valuable ongoing project to do with your class or school.

Once your students have increased their knowledge of local plants, you could use this knowledge to plan and design a nature project, which will make it easier



for next year's students to learn about local plants. Projects such as this allow students to transfer learning from one context to another, to make decisions and to work closely with others. This enables students to develop skills that help them to become cooperative members of the community.

Undertaking a project like this can be daunting if you have not done it before. You will need to plan carefully and not worry if it does not go exactly as you planned. The important thing is to think about the experience: What went well? What would you change next time? What did you enjoy? Most importantly, did this activity allow your students to be active learners?

Teaching Example 3

At Akaa-Buem Roman Catholic Primary the teacher came into the class with samples of local plants collected from around the school. Students struggled to identify most of the plants. Yet the week before, they had brainstormed a list of 52 local plants in 15 minutes. They knew the names, but could not always associate the correct name with a specific plant. There was a problem here.

The teacher suggested that her class could increase their knowledge of local plants and also produce a resource for other students in the school. She explained that the students would be responsible for developing an accurate checklist of all the plants they could name and identify in the local area. Then she helped them draw up a plan of how they would approach this, by giving them these questions:

- Which plants are you going to include?
- What information are you going to give about each plant? (e.g. shape of leaves, where it grows, does it have flowers? how big is it? is it useful? do any animals eat it? are there any stories about it?)
- What do you already know about each plant?
- How will you find out more about each plant?
- How will you present this information?
- How will you organise yourselves to do this task as efficiently as possible?

Her students organised themselves into groups, each with responsibility for one area. They set themselves a timetable.

The students responded well to the challenge of increasing their knowledge of local plants. They presented their work to the school in an assembly and also invited parents to come and see what they had learned. Everyone praised their work and the way they had worked together.

The teacher explained that this is the kind of work done by trained botanists. She told her students that they were thinking and behaving like scientists.



Activity 3

A nature trail is a path that can be walked and which includes places where interesting trees and other plants can be seen. As well as a map that shows sites of interest, a trail often has an information brochure or pamphlet that gives additional interesting information.

Work with your students to plan a nature trail near your school. Developing a nature trail gives more detailed advice for organising this activity, as well as some of the safety precautions you might need to take account of.

Developing a nature trail

Developing a nature trail is not a difficult thing to do. You and your students learn a lot and it helps you all appreciate what the environment has to offer.

What is a nature trail?

A trail is a planned walk along a mapped-out path. There are sites, or stations, along the trail where people can stop to observe things of interest. There is usually a pamphlet or guide that explains what is to be seen and gives extra details and background information to support people's observations.

The first step – discussion

You need to start off by discussing what you mean by a nature trail. The students need to feel it is something worth doing. You should talk a little about what plants you plan to look out for, and what you want to focus on. It could be something simple like how many different types of tree can we find, and what plants do we find associated with the different kinds of trees. Or perhaps you could focus on looking for signs of resilience in plants. Make sure you make a few notes in this discussion.

First exploratory walk

You need at least two clipboards so that people can write easily on the walk. If you don't have clipboards, they can be easily improvised using stiff card and clothes pegs. The first clipboard is for a pair of students who volunteer to map the route you take and note down the points of interest. The second clipboard will be for a pair of students who list the plants as they are found. If you have lots of clipboards, students could work in groups of four with two clipboards for each group.

Before you start the walk, speak to your students about appropriate behaviour and think about any possible dangers. The biggest fear might be of snakes, but when a large crowd walks in the bush, any sensible snake makes sure that it is well out of the way. If a snake is seen, it is best left alone. No one should panic. Give the snake time to move away. Then just walk past calmly, avoiding the place where the creature was last seen. Eating unknown plant parts or berries could be dangerous, and students should watch out for thorns and stinging nettles as well as stinging insects like hornets. Another thing to be avoided is somebody letting a branch swing back into the face of the following person, especially if it has thorns.



As you go round the walk, stop when you see anything interesting. Spend a little time observing. Encourage students to ask questions and to try to find answers to the questions raised. When you come across plants that are not known, ask one pupil to be responsible for finding out its name and any interesting information about it. They might need to break off a small part of a twig with some leaves, flowers or fruit without harming the plant. If you have a camera/cellphone you could take photos of each plant and tree.

A circular path is best, but the way will also depend on the paths available to you.

After the walk – discussion

When you get back to the classroom, discuss what went well. What didn't you see that you were hoping to see? Did you notice any differences between north- and south-facing slopes? Or any differences near streams, lakes or roads?

Research

Give your students a few days to find out about the plants that were not well known. Let them report back and write up what they have found.

Second exploratory walk

Now you want to improve on what happened the first time. You might also want to think of a way of numbering or marking the larger plants that doesn't harm them, but makes identification easier. This is a problem to solve. You need something durable (that lasts) which can be fastened to a plant and can be seen. A few more outings with some of your students may still be needed before a final route is settled and the stations are properly marked on the map.

Finalising the nature trail

Then a pamphlet or booklet can be designed and made. Groups of students could each plan, design and prepare a page for part of the nature trail. Make sure that your students give tasks to different members of the class and that everyone has a chance to contribute to the pamphlet. (If you have access to a computer or laptop, your students could use this to lay out their pamphlet. You might include images from a camera/cellphone or from the Internet).

Your class could now invite other classes or teachers to experience the nature trail that they have designed. It might be interesting to invite some students from a neighbouring school. Another task is to ask some volunteers to design a questionnaire to find out what people think of the trail.

Later, you and your students might want to assess the trail and even think of ways you could improve on your first attempt (perhaps you could survey the opinions of other students who use the nature trail).



Social Science: Making Local Maps

- 1 Getting to Know the Local Area
- 2 Using Symbols on Maps
- 3 Displaying art from home and school

Key question for the teacher:

How can you use the local area to help students understand maps and plans?

Keywords: maps; group work; symbols; investigation; game

Learning Outcomes for the Teacher

By the end of this section, you will have:

- used local resources to develop your skills in teaching about the physical features of your students' home and school areas
- used games to extend your students' understanding of maps
- used group work as a teaching and learning strategy to manage large and small classes

Overview

Most students have some understanding of the area in which they live. They know the quickest way to their friends' houses or the local market. When developing their understanding of place and, in particular, their mapping skills, it is always important to start with what students know before you move on to what they don't know. This gives students confidence, because you are using what they already understand.

Building on what your students know about the physical features of their home and school environments, ensure you move on to more formal mapping of their local surroundings. This provides a meaningful context to explore the symbols used in mapping. The activities in this section will help you encourage your students' skills in observation and help transfer their knowledge into maps and plans.

You will also develop your skills in using group work in your classroom



1 Getting to Know the Local Area

Most students know a lot about their local area and may be able to map their understanding of where things are in their own way. First, it is important to develop your students' abilities to observe their local environment and to make these activities meaningful for them. Explain that noticing the features in their surroundings enables them to locate places in relation to each other and to describe places clearly. Having a sense of direction helps students to find

their way around. Once they understand their own environment, and their way around it, your students can begin to explore the wider world.

One way to start observing the local environment is to encourage your students to keep a notebook with them and to draw or write down any interesting things they see as they move around the local area. Another way is to work with your students to produce a class mural or picture on the classroom wall. Each day, a small number of students could add pictures (and words from older students) of things in the local area

Teaching Example 1

Mrs Kazimoto, a teacher at Dabanga Primary School in Tanzania, wants to develop her Grade 3 students' skills at observing and identifying important features in the local area. She will then progress to drawing maps.

Mrs Kazimoto has a large class and so she divides them into eight groups of ten students. She knows that using group work will help her manage the class and ensure that all students participate. It will also develop their cooperative learning skills. (See 'Using group work in your classroom' at the end of Teacher's Pack 1)

She asks each group to list all the features of the school grounds that they see as they come to school, such as trees, buildings etc. She asks one person in each group to write down all the important information. After a few minutes, she stops the class and asks each group to read out one feature from their list, which she writes on the board. She keeps going round the class until they have read out all the features.

Next, Mrs Kazimoto hands out large pieces of paper to each group and asks them to mark in the middle a square for the school. Each student is then asked to place a feature on the paper in the correct place.

When each group has finished, Mrs Kazimoto sends them outside to see what they had in the right place and what they need to move or add. Their plans are modified and then displayed in the classroom.

Mrs Kazimoto sees that two groups have managed very well. The other groups have had to modify quite a few features and she plans to take these students out in groups to do some more simple mapping of the school



Activity 1

- Ask your students to observe and record in their notebook or exercise book 6–10 important things they see on their way to school the next day. Younger students might do drawings.
- In class, ask each student to arrange what they saw in the order they saw it.
- Explain to the students what a physical feature is.
- Ask the students to tick the physical features on their list.
- Ask them why some of the things they observed are not physical features. Would they expect to find these on a map? Discuss why this is so e.g. some things such as dogs and cats move, as do cars, so these are not (permanent) physical features.
- Ask the students from which direction they come to get to school i.e. North, South, East and West (N, S, E and W). You may have to explain about this and have a map ready for them to see or remind them about N, S, E and W.
- Based on the directions, form four groups, each comprising students who come from roughly the same direction. If all your students came to school from only one or two directions, we suggest you take your students on a class walk to explore the other directions.
- Ask each group to make one joint list of the physical features found on their route home. Can they put them in the order in which they would see them on their way from school to home?
- Display the lists, according to the direction, on the walls of the classroom.

What other activities could you do to develop your students' observation skills?

2 Using Symbols on Maps

Observing the features of the local area is a first step to producing a map. To help your students understand a map, you need to introduce them to the idea of **symbols**.

Teaching Example 2

Miss Yaa Nsiah, a teacher of Class 5 students in Cape Coast, Central Region, wanted to build on students' knowledge of direction and the local environment to introduce the idea of using symbols to represent physical features. She decided to hold a treasure hunt.

Before the lesson, she observed six physical features of the school, including the gates, the large tree and the head teacher's office. She found six pieces of cardboard and drew one symbol on each to represent one feature (e.g. a desk for the head teacher's office). She then numbered the card and added directions to the next symbol on each card. She placed the pieces of card at their specific locations.



In class, the students were divided into 'search parties' and given their first clues. They had to go outside the classroom, and turn in an easterly direction – the teacher helped by telling them this to get started. When they found the card at the feature this gave them the next direction to move in, and another symbol to find, and so on.

The students found this game very exciting. They were very involved in trying to work out what the symbols meant and move in the right direction. Miss Nsiah followed the groups around and was on hand to help any that were struggling with what the symbols meant or which direction to follow.

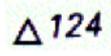
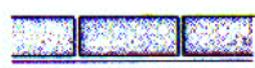
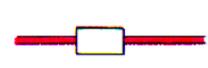
Everyone reached the final card. Miss Nsiah was pleased because she knew they had managed to interpret all the symbols and understand direction better.

Activity 2

- Begin your lesson with a brief explanation of the use and importance of symbols on maps. Ask students to give you examples of common symbols they know that are used around them (e.g. on roads) and use these to build up a list of standard symbols. (See **Map symbols** at the end of Activity 2 for some examples.) You could build the list up over a week and make a classroom display.
- Ask students to think about why the geological survey department has used these symbols rather than words. This kind of questioning will help them to think of the value and importance of symbols. Now ask each student to think of three physical features they see on their way to school and draw a symbol for each. After a few minutes, ask students to swap their symbols with a partner. Can the partners guess what the symbols mean?
- Ask some students to come and draw their symbols on the board. Can other students work out what they mean?
- Finish the lesson by seeing if the students can decide what makes a good symbol.

List their reasons on the board

Map Symbols

Road: National freeway		Trigonometrical beacon (the beacon number shows height)	
Road: National route		Urban built-up area	
Road: Arterial route		Building (of significance or isolated)	
Road: Main road		Bridge	



Road: Secondary road		Cultivated land	
Railway (showing a station)		Row of trees (where of significance)	
River: Perennial (has water all year)		Wind pump	
River: Non-perennial		Communication tower	
Dam		Eroded area	
Pan: Perennial		Boundary: International	
Pan: Non-perennial		Boundary: Provincial	
Pan: Dry		Boundary: Cadastral farm (original farm)	
Canal		Boundary: Game reserve	
Powerline (major lines only)		Boundary: State forest	
Spot height (elevation at a point)		Contour	

3 Understanding Local Maps

Developing knowledge and understanding of the standard symbols that are used on maps worldwide will help your students explore physical features of any area in the world. It will also help them understand the way maps are constructed and their value in daily life, especially as they grow and travel to new areas.

However, it is important to use ways of working that involve students actively in exploring their surroundings and thinking deeply about the problem they are trying to solve. Using local resources and experts helps students understand more as the context has meaning for them. It may be possible for you to find someone who is knowledgeable about maps to come and speak to the students about how maps of their local area were drawn and explain the meaning of the symbols that depict local physical features.



Teaching Example 3

Mr Chukwu is a teacher in an urban primary school in Western Region. He wanted his students to be able to study a map and recognise the physical features in any area.

Mr Chukwu decided to use a real map of the city of Takoradi and so, two weeks before he planned to do the work, he visited the geological survey department to obtain a number of topo sheets of the area. He drew up a worksheet for his students to use based on the topo sheets. Because this work would involve symbols, he also drew up a chart of symbols, which he planned to display in the classroom.

As the geological survey department was only able to give him five topo sheets, he divided his class into five groups. Mr Chukwu showed his students the chart that identifies the symbols, and handed out a map and one of his prepared worksheets to each group. He had identified a number of roads, major buildings, some bus stations, a market and a hospital, all of which the groups had to find on the map.

Next, he asked the students to work out the scale. He explained that map scales compare the size of the map with the real size of a place. Mr Chukwu showed his students how to read the information shown on the scale statement and the scale bar.

When the groups had finished analysing the maps and completed the worksheets, they swapped their worksheets with other groups, and checked to see whether they had found the same answers. Where there were inconsistencies, Mr Chukwu asked the groups to confer and agree on an answer.

At the end of the lesson, he went through the symbols with the whole class. Where groups had come up with different answers, they discussed the reasons and agreed on a final answer.

Activity 3

- Tell the class that you are going to draw a large map together of the different routes they take to school and the physical features around the school.
- Divide the class into four groups according to the direction they take from their homes to school (N, S, E and W).
- Ask each group to list the physical features that they see on the way to school
- Mark four spaces on the ground – or on a large piece of paper or plain cloth – N, S, E and W.
- With your younger students discuss the symbols to use and draw them on the board. Then ask them to use the symbols on their maps.
- Then each group adds to what was not drawn by their fellow students.
- Once the big picture is completed, discuss with the students how they now have a large map of the whole area around the school in front of them.

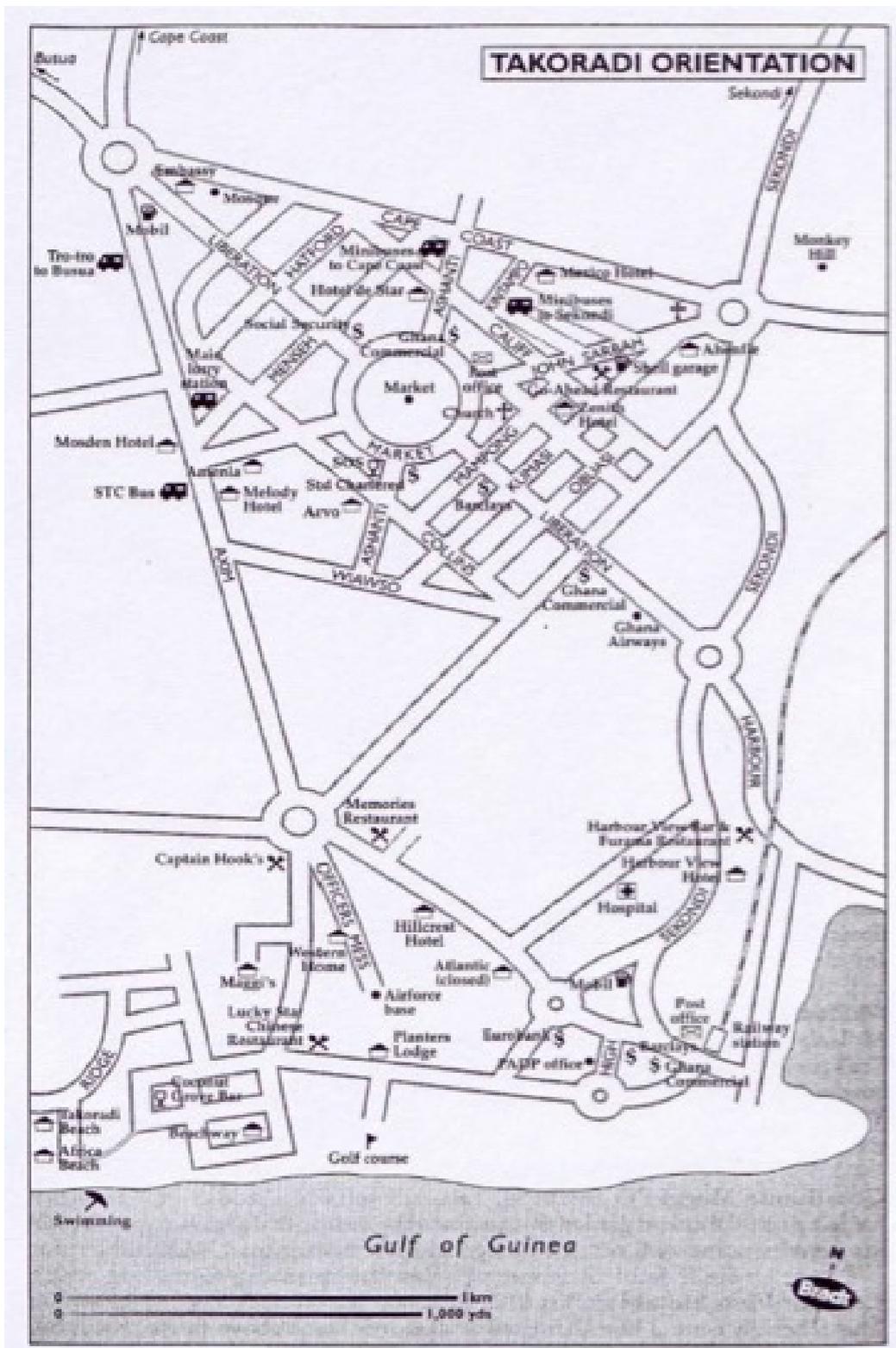


- Ask the students from different groups to look at a map from another route and see if they can identify what the symbols mean.

Finally, ask students to draw their own small maps of the school and its surroundings, using the larger map as a guide.



Here is an example of a map and questions to ask your students about it
A Map of Takorada



Questions about the map of Takorada

- If you wanted to buy petrol for your car, which three streets might you go to?
- Which sport might you play if you were next to the beach?



- c) Can you name two banks located within the area shown on the map?
 - d) What is next to the railway station?
 - e) Where is Takoradi market located?
 - f) If you wanted to take an STC bus out of Takoradi, which street would you go to?
 - g) If someone asked you for directions to Takoradi hospital, which hotel could you tell them that it's near?
-



Life Skills: Ways to Explore who Students Are

- 1 Similarities and Differences
- 2 Feelings and Opinions
- 3 Understanding Your Students Better

Key Question for the teacher:

How can you help students explore who they are in ways that are sensitive and stimulating?

Keywords: class management; questioning; group work; thinking; data gathering; respect; sensitivity

Learning Outcomes for the Teacher

By the end of this section, you will have:

- developed your skills in organising the class in ways that will help students show respect for each other
- developed your skills in asking questions to encourage thinking
- used different ways to gather data to help students discuss who they are

Overview

We all learn best when we feel comfortable and safe. As a teacher, one of your key roles is to support your students so that everyone is able to participate fully and feels they are respected and their ideas are listened to.

This section explores how to do this by looking at different ways of organising the class. You will help students learn how to treat each other with respect by:

- helping them understand their similarities and differences
- asking them to share opinions and feelings
- giving them tasks where they can ask each other questions and listen to the answers.



1 Similarities and Differences

Young children often find it easier to identify difference rather than similarity. In this part, we show two ways to organise your students that will help them to explore differences and similarities.

They will:

- learn how to share information and contribute to discussions;
- learn about themselves and each other;
- have better self-esteem as they realise their ideas are as valued as those of others.

As a teacher, it is important for you to encourage this – if your students all understand their similarities and celebrate their differences, they will treat each other better. You should act as a role model, treating your students fairly and equally.

Before starting, it is a good idea to reflect on this and think about whether you treat your students respectfully. Do you ever have a ‘bad day’ when you shout at them for no good reason? Do you have favourites who you treat more kindly than others? If you can answer these questions honestly, you can take steps to make sure that all your students are treated fairly and respectfully.

You may find the following useful for your own planning. You could ask yourself questions including: What questions will the students ask each other? What information will they need to find out? Will they work in groups? In pairs? How will you organise this? How will you give them instructions to do the activities?

Teaching Example 1

Chanda teaches at a rural primary school in Mwenda, Zambia. He is working with his students to develop a positive classroom environment. He is looking at the students’ similarities and differences and asks them to think about the ways in which they are all the same.

First, the whole class practises making sentences, e.g.: ‘We all like food’; ‘We all go to school’. Next, he puts them in groups of five to think of five sentences beginning: ‘We all ...’ with one student in each group writing the sentences on a piece of paper.

After ten minutes, each group reads out one sentence. If the class agrees with the sentence, Chanda writes it on the board.

Using the sentences, he shows the class the different ways in which we are the same:

- e.g. physically – ‘We all have skin’;
- e.g. how we experience the same kind of feelings – ‘We all feel happy’;
- e.g. situation – ‘We all are school students’.

Chanda is pleased with the ideas from his class and plans to use this as a starting point to look at differences



Activity 1

(see **Types of Similarities and Differences** at the end of Activity 1 for some information and ideas)

- To introduce the idea of 'the same', start by asking easy questions. Hold up two pencils and ask: 'Are they the same? Why?'
- Hold up a pen and a pencil. Ask: 'Are they the same? Why?'
- Repeat this, using different objects.
- Ask two children to step forward. Ask: 'Are they the same?'
- Be careful. If they are girls, the students might say 'Yes!' If it is a boy and a girl, they might say 'No!' But they might give other answers e.g. the children might be the same height or have the same name.
- Split the class into pairs. Ask them to look at each other's features including such things as height, foot size and possibly hair, eyes etc. and list how they are similar.
- Share their ideas, one group giving one idea at a time.

Did they listen to each other? Did they accept the idea of being the same but different? What evidence do you have for your answer?

Types of Similarities and Differences

Appearance

The most obvious way in which people are different is in their appearance. Some are tall, some are short. Some are fat, some are thin. If you are working with your students to explain similarities and differences between people, then looking at physical features is an easy place to start. You must also be careful: like adults, children can be sensitive about their appearance, so you should try not to draw attention to something that a student might be embarrassed about. Instead, focus on similarities such as 'We all wear clothes'. You will need to be especially careful if you have children with physical disabilities in your class.

In addition, children sometimes tease or bully other children, and drawing attention to differences in appearance might encourage them to behave like this outside of the class. So, as well as helping students identify their differences in appearance, you should also emphasise how many similarities there are. If students can see the connections between themselves and others, they are more likely to treat others with respect

Similarities and differences in personality

While it is easier to see the similarities and differences between people's appearances – the way we look – it is probably more important for students to understand the similarities and differences between people's personalities – the ways we think, feel and behave.



Our opinions and feelings influence the way we behave with other people. They can be summarised as follows:

- 'Opinions' cover what people think about things – whether they like or dislike something, or whether they agree or disagree with something. Differences in opinion can sometimes cause arguments and fights, whether with children or adults. Opinions can be based on clear factual knowledge or hearsay which is not always accurate.
- 'Feelings' cover people's emotions – whether something makes them feel happy, sad, angry or frightened etc. Feelings can sometimes be hard to explain, and if someone has different feelings about something to you, it can be difficult for you to understand it.

As children grow up, it is important for them to be able to understand their feelings and emotions, interact with other people, and recognise the needs of others. It is important for children to learn that not everybody thinks and feels the same way that they do. Each person's ideas, feelings and opinions will have been influenced by their home environment, experiences and carers. This diversity (variety) should not be seen as a problem – except where it goes against legally accepted behaviour. The activities in this module will help students begin to appreciate such diversity as a basis for friendship and working together.

As a teacher, you need to understand the feelings of your pupils and make sure that you consider their feelings and differences as you plan their learning. You must be considerate of the fact that some children will enjoy certain activities – e.g. talking in front of the class – and others will not.

However, you must also be fair and equal with your pupils. If you treat each of your pupils differently in class, the children will see this and begin doing the same, both inside and outside of school.

2 Feelings and Opinions

Understanding differences in people's opinions and feelings is important in developing good relationships. This is essential when dealing with a class of young people, from many different contexts, (backgrounds and settings), with different opinions and feelings. Your students need to understand this to help them communicate effectively and sensitively with each other.

However, before we can learn to understand different opinions and feelings, we first need to recognise them.

You can compare your students' opinions by organising a survey. You need to plan how to:

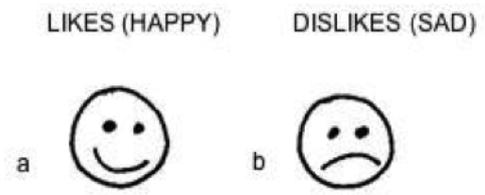
- organise the survey;
- explain it to the students;
- check that they have understood.



Teaching Example 2

One week Mr Obeng used a 'Do you like...?' survey with his primary 5 class. He recorded their answers and stuck them on the wall. He often found students reading them and talking together.

The next week, Mr Obeng asked again about likes and dislikes, but this time, he drew two faces on the board:



For each question, they counted the number of 'likes' in the class and wrote the number under face a. They wrote the number of 'dislikes' under face b.

To introduce the idea of feelings, he wrote 'HAPPY' above face a, and 'SAD' above face b. In groups of four or five, the students named things that made them feel happy or sad. Working in small groups helped involve the quieter students.

He repeated the exercise, this time using:



In their groups, the students named things that made them feel angry or frightened. They shared the main ideas together as a class. They looked at whether some things occurred in more than one list and discussed why this might be. Mr Obeng was pleased with how thoughtful they were.

Activity 2

(See **How to conduct a class survey** at the end of Activity 2 to help you prepare)

- Perhaps start by asking your class easy questions about what they like and dislike, e.g. 'Do you like homework?'
- In pairs, the students think of their own questions about what they like and dislike and record these.



- Draw the chart from **How to conduct a class survey** (at the end of Activity 2) on the board. Ask your students to copy it and choose three of their own questions. With older classes you could put in more questions.
- Explain that they will all ask five students the questions and write down 'Y' or 'N' for the answer under their names.
- Ask the pairs to compare their answers. Ask some students to read out their questions and answers so that the whole class can hear the different responses. Discuss what they have found out from the survey.

Think about what the students learned from the activity and how you know this.

How to conduct a class survey

1. What is a survey?

A survey is a way of gathering information from many different people on a particular topic. It can explore a range of opinions in a group, and help to find out more about individuals.

To gather the information, a survey usually uses a chart to record the responses. The chart below is one example where the answers could be recorded easily and quickly by using a Y for a yes and an N for a no in each box:

Name:	...Faith...
1. Do you like yams?					
2. Do you like...?					
3. Do you like...?					

A survey is an interesting way for pupils to practise finding out information for themselves.

Because a survey has many different stages, it can take a whole lesson to complete – or longer, if pupils have to ask people outside school. Providing time for the data collection to happen is especially important so that everyone is involved and able to see the process in action.

2. Choosing your topic

When deciding to do a survey with your class, you need to think carefully about what the survey will be about – what information will you find out? Clearly, the survey should be linked in some way to the topic in class. For example, if teaching about similarities and differences, a survey about the different foods people like might be an idea. The pupils will be more involved if they suggest ideas themselves.

It is important at this stage to think about the skills that your pupils need to develop and practise. Design a survey that matches your learning objectives

3. Writing the questions

In any survey, it is good for the pupils to think of and write their own questions – each pupil or group of pupils should come up with their own ideas. But you need to think about how you will organise the pupils to do



this. Pair or group work is good if it is the first time that they have done this, as then they can check each other's work. To help pupils do a survey you may need to decide (by yourself or with the pupils):

- how they are to work e.g. individually, in pairs, or in groups;
- how many questions they should write (3–5 is usually enough);
- what types of questions they should ask (provide some examples yourself and ask them for some more examples to check that they understand);
- how much time they will have to write the questions – 10–15 minutes should be enough for 3–5 questions.

It is important to do all the above with the whole class together before they start working. As they work, go round and monitor their work to check that they really have understood the task.

The type of question they will write depends on the kind of information that they want to find out. For example, if the idea of the survey is to gather information about the numbers of pupils who think/like/do something, then they might write 'Yes/No' questions: e.g. 'Do you like football?'

However, if the idea of the survey is to gather information about the range of interests in the class, then they might write 'open-ended' questions: e.g. 'What sports do you like?' They will have to think of ways to record the answers.

4. Asking the questions

Every pupil should practise asking and answering questions on a one-to-one basis. Think carefully about how you would organise this. Here are a few suggestions:

- Pupils do not need to speak to everybody in the class. This would take too much time and also be very repetitive. A sample of five pupils may be enough, and maybe no more than ten pupils – depending on the size of your class.
- If they wrote their questions in pairs or groups, they shouldn't ask each other the questions. Instead, suggest they ask others in the class or school.

Organising pupils into groups to do the survey can be useful if you have a large class. You also need to ensure that all pupils are involved in writing and asking the questions. (See Using **group work in your classroom** at the end of Teacher's Pack 1)

5. Recording the answers

The pupils need to be clear about the responses they are recording and keep these as short as possible.

For example, if they are asking open-ended questions, they can write down one-word answers: Q: What sports do you like? A: football/running/jumping.

If they are asking Yes/No questions, they can write Y or N as an answer.



If they are gathering information on numbers, they could just keep a tally, with one mark representing one person: e.g.

Favourite sports:	Football	Running	Jumping	Catch
Numbers:	IIIII	IIIIII	III	IIII

Again, plan this carefully, and explain it to the pupils before they gather their data. To check they understand, you could ask them to explain it to you, too.

6. Comparing answers

After the pupils have asked questions and recorded the information, it is good for them to talk in pairs or groups about their data and compare answers. This data can be used to discuss people's likes and dislikes and they could draw graphs of the results to make it easy to see the differences and discuss what they mean.

Displaying their findings or asking them to write about their findings will help you understand their thinking and give them the opportunity to think more deeply about

3 Understanding Your Students Better

Appreciating the similarities and differences among your students will help you become a more effective teacher. You will be able to plan better to match their needs. If your students also understand themselves and others, they will become more confident about participating in class.

As the students realise the ways in which they are different from other people, it is important that they should not start to feel isolated or left out. Part of your role is to help them understand that agreeing with people on one thing and disagreeing on others is acceptable and not a reason for conflict.

When a child is seen to be different because of how they look or behave, other children may bully or tease them. Bullying can make children very unhappy. It damages their schoolwork and stops them from making friends.

Children need to learn how to interact with each other. Your role as teacher is crucial for helping them understand the difference between right and wrong.

How can you encourage this? Below are some other ideas you can use. Try them out. Are they successful? Did you have any problems?

Teaching Example 3

Mrs Ojo has a boy in her class who is an albino. One day, she had seen some girls laughing at him and calling him names. This made her upset, but she allowed herself to calm down and after school, she asked them: 'Why were you behaving like that?' She asked how they would feel if



somebody teased them, and how they thought it made him feel. With questions like this, she helped them think about their behaviour. Thinking about this afterwards, she decided to help all her students respect each other's differences.

The next day, in class, she used a story about a child with polio to start a discussion about how her students would feel if they had polio. She also used the words and ideas for talking about likes, dislikes and feelings when she needed to talk to the students about their behaviour.

When two boys were fighting, Mrs Ojo talked with them, one at a time, to find out why they were angry with each other and helped them resolve their conflict. When one child was sitting alone, she asked others to find out why and make friends with him. This way, her students began to look after each other. Mrs Ojo was pleased.

Activity 3

See **Observing your Students** at the end of Activity 3

- Organise your students into groups of five.
- Ask each group to imagine two brothers or sisters whose likes and dislikes are opposite. Ask them to imagine a conflict between them.
- Ask them to role-play the conflict. Two members of the group will be the brothers or sisters. The others could be the mother, father and grandparent.
- First, they should role-play the conflict, and then discuss the conflict all together. Next they should role-play the resolution, which should be a peaceful one.
- Next, the group should discuss their ideas about the causes of the conflict and the resolution.
- Finally, ask each group to act out their role plays to the class, and explain the lesson that they learned. Collect each of these lessons together and display them on the wall to remind everyone.

If you have time, at the end of each role play, allow the rest of the class to ask questions to the group or give further ideas as to how the conflict could be resolved.

Observing your students

Observing or watching your pupils at work in the classroom or playing in the playground is a very good way to build up a picture of them as people. It tells you who they mix with and whether any pupils are isolated. Such information can help you plan activities that better match their needs.

Do they talk more in groups? If so, by using group work more, you may help them think more and therefore learn more. You can observe at two levels by looking at:



- the social groups in your class and how they do or do not interact. What kinds of conflicts are there, if any? How can you use this knowledge to plan group work?
- individuals and their social skills, interests etc. (Finding out and acknowledging what pupils are interested in outside and inside school can be a very powerful way of motivating them to learn.)

Observing your students

Some aspects you could look out for as you watch your students are in the table below. But remember to keep an open mind and readjust your picture as you get to know your students better.



Below is an example of how to record student observation. A version of this was used in the Literacy Development Across the Curriculum programme in Nigeria.

Tick the appropriate column in terms of the student you are observing.

0 = not at all; 1 = poor; 2 = fair; 3 = good

	Not at all (0)	Poor (1)	Fair (2)	Good (3)
(a) Student participates actively in the lesson				
(b) Student produces something creative				
(c) Student works in groups or pairs				
(d) Student shares ideas/information				
(e) Student shows evidence of understanding lesson				
(f) Student is not afraid to ask questions				
(g) Student shows respect for the ideas of members of the class.				



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