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UNIVERSITY OF FORT HARE

Eastern Cape Education Department

Distance Education Project

Core Learning Areas Course

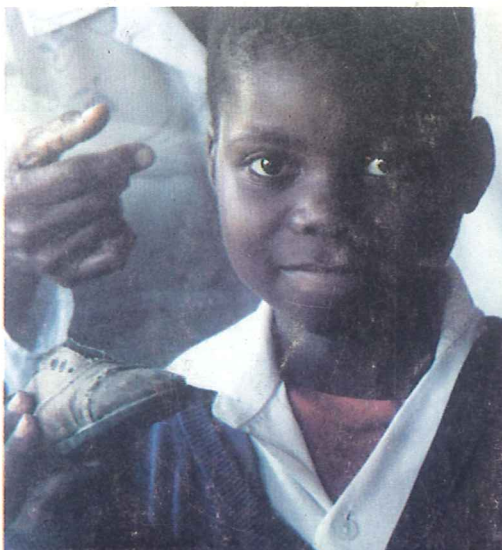
Technology Education

4th Umthamo

Differentiated Group Work

Joining and Fastening

Pilot Edition
July 2000



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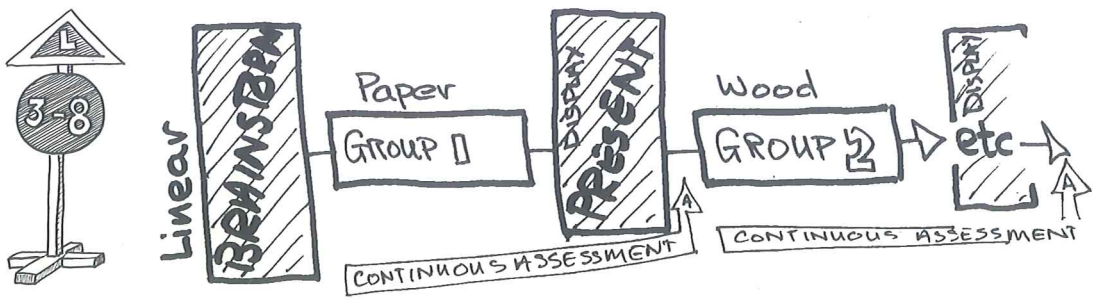
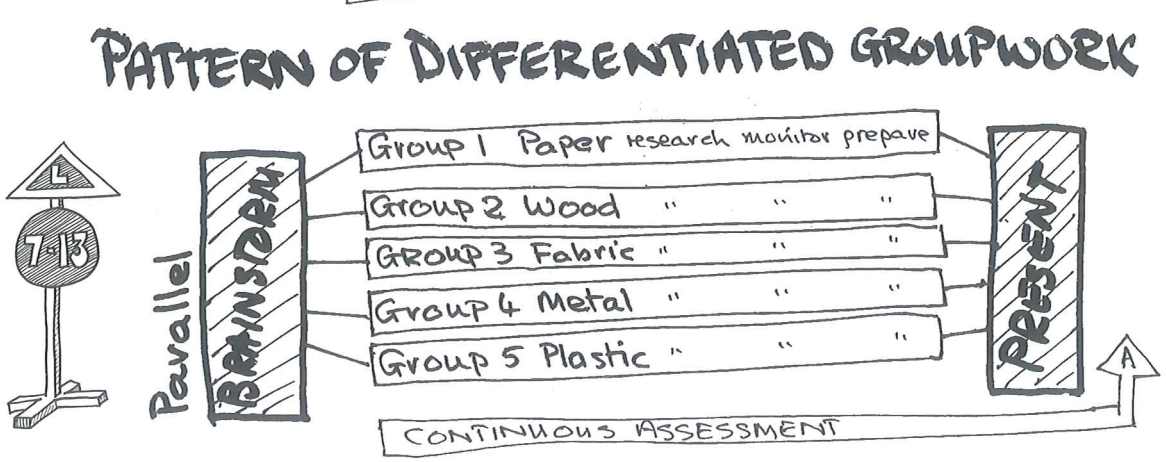
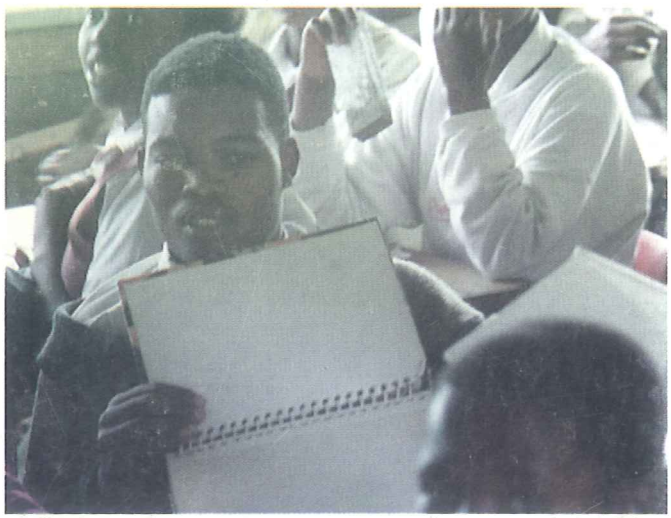
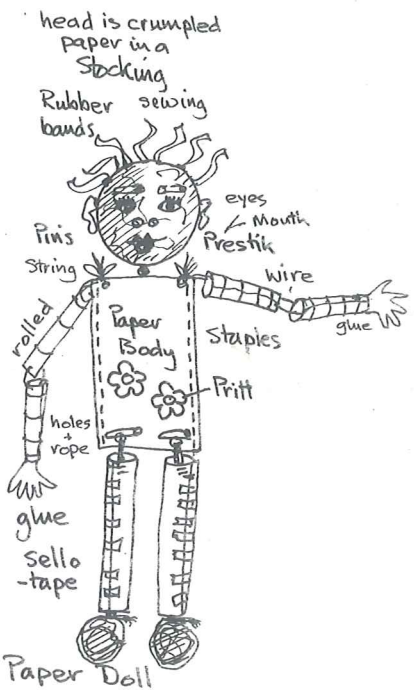




Only recently have we begun to realise the full potential of ….. (Technology Education). Not only have we discovered a wide range of new and previously unused processes and materials, but we have also rediscovered the intellectual as well as the practical learning that can take place in work with materials. Above all, we have realised more fundamentally than ever before that, in a modern society, human capacity to use and to modify the environment is critically determined by capacity to understand, plan and utilise resources of three-dimensional materials. Their availability and well-designed manipulation are as essential to the activities of an advanced industrial economy as they have been to those of any previous social system. Their importance in every phase of human pursuit, from the most basic to the most esoteric, is self-evident; their importance in the capacity of humans to express themselves has probably never been so great. And as the scarcity of natural resources intensifies, and the cost of materials produced from them rises, the argument for work in the school that enhances thought and discrimination in their use becomes ever more compelling.

Eggleston, J. 1996. *Teaching Design and Technology*.





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Contents

Introduction

This umthamo is a continuation of the previous Technology umthamo on processes and processing. Our focus will be more on the process of **joining** things. It would be impossible to **join** things without using materials and special tools.

Joining is a very important part of making. When we design something, we have to consider carefully just how we plan to **join** or **fasten** the parts of what we make. There is a great deal to be investigated and understood when it comes to **joining.** There are also special skills that can be learned and taught.

Think of materials or things that we usually **join** to produce things. **Joining** is one of the techniques of processing materials. For example, in the previous Technology umthamo on processes, some of our learners embarked on **joining** materials or things. Remind yourself of the things they have been **joining.** Again, think of the things that were **joined** by our fathers and mothers in the olden days. Are there any products from the area in which you teach which are processed through **joining?** The above questions are probing more thought about **joining.** They can be shared in the face-to-face with other colleagues and your umkhwezeli.

Read the story below.

The Story of Umpintsho Village

In April, several ESSOs and one of the Academic Co-ordinators went to trial activities for Umthamo 28 for two days. On the second day, it was a mini Open Day whereby parents, members of the School Governing Body (SGB), educators and learners of Mfunalwazi Public School gathered outside. Parents were engaged in numerous activities. For example, they were displaying and explaining traditional food such as *imithwane, umpho koqo,* etc. They demonstrated and explained how traditional tobacco is processed, narrated *iintsomi* and showed the process of weaving baskets, mats and snack dishes.

The one we preferred was the personal weaving story that was told by Nomayineti Kashe. Nomayineti is not an old woman, nor is she a young one. She told the audience how she started weaving on the farm called Hakahaka in 1982. She was staying with her husband who wasn't earning enough for the family to live on. In fact, he was getting just R45 per month. Because of this, one of the elderly women showed her how to weave baskets and

dishes. There were other women who already know how to weave. A special grass called *incaluka* was used. It was fetched near the river banks or from damp areas. The first thing to be done before **joining** is to let the stems of the grass dry for three days in the sun.

A special needle was used to weave or join the stems of reeds to form baskets, mats, or dishes. Initially she was slow because it took about three days to make a finished product. But with time, it took less than a day. She sold the products to the tourists to add to her husband's income. When they moved to Tsholomnqa, the business didn't go well because people were not that interested in buying baskets and the other stuff.

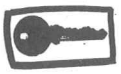
Another interesting skill, was the one that was taught by Momutile, also from Mpintsho Village, and almost the same age as Nomayineti. She specialised in weaving *amakhuko*. She used *imizi*. You first remove the *intshatshoba*, and let it dry for a short while. The interesting thing about her weaving style is that she doesn't use the needle. Everything is joined by hands, using *galbome* (a type of aloe) to weave and produce beautiful mats.

One can see from the above story how a person can solve economic problems through technology. By learning a skill of making something useful from available materials that could be collected, dried and then **joined together** by weaving, a family was able to add to its meagre income and survive.

In this umthamo, we will be suggesting that you try an interesting approach to group work. This should be quite a challenge, but we are certain that you and your learners will find it exciting to do. What we want you to do is to co-ordinate a **differentiated class project** where each group researches and investigates a different aspect of a Technology topic. The topic we have chosen to focus on is the idea of **Joining and Fastening.**

Joining and Fastening is a broad topic. It has social and cultural significance. In all our lives we form bonds of friendship, love and family. In language we join words and sentences, link ideas and compose (put together) stories and writings. Even when we learn, we have to join the new to what we already know (think of the processes of assimilation and accommodation according to Piaget). Ideas about joining are taken further in academic studies in the Sciences – bonding in Chemistry, forces of adhesion in

Physics, and many aspects of Biology such as reproduction, fertilisation, pollination, genetics, and so on.



The **Key Activity** of this umthamo is to co-ordinate a differentiated class project where groups research the technologies of **joining** and **fastening** materials. Each group will focus on a *different* material and the ways in which it can be joined or fastened. This will take some time. In the case of younger learners, you will find that this will take several weeks.

We have spread the guidelines for carrying out this Activity throughout the umthamo, starting in Unit 1. When your learners have presented their work, you will guide them through a process of reflective assessment of all their research leading up to the Presentation.

Finally, you will complete a carefully written Reflective Report or Case Study of the research work and presentation of just **one** of the groups. You will need to write up this work **in detail** so that whoever reads the Report can picture *exactly* what your learners did, what they discovered, and what they shared with their peers and yourself. You will include a useful reflection on your role in guiding and supporting the group's work. You will hand in this Case Study, and your reflection, to your umkhwezeli for appraisal.

Although you will only write up the research work of **one** group, you will need to be prepared to share what **all** the groups researched and found out at the Portfolio Presentation and Moderation at the end of the year.

If you work with younger learners, you may find that you are not able to work with all your groups to research an aspect of this topic *before* the Portfolio Presentation and Moderation. Don't worry. Present the work that you have done to date. But we would urge you to continue with this project until **every** group has had a chance to mount a display, and to present to the rest of the class.

Outcomes

When you have worked through this umthamo with your learners, you will have

- experienced an approach of co-ordinating a **differentiated group work project**
- helped your learners become **more aware** of the technologies around them that relate to joining.

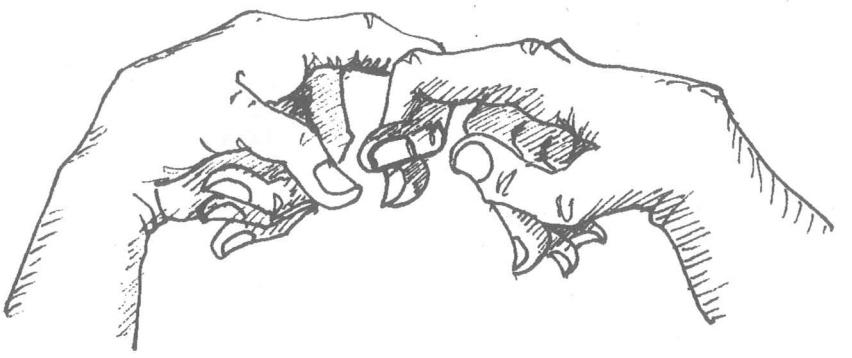
A long-term outcome should be that both you and your learners become more curious about how things work, how they are made and joined, and how they can be repaired, or even improved.

When many of us were at school, girls sat quietly doing Needlework, while boys went outside to do Agriculture. In some schools, the boys did woodwork or metal work while the girls did cooking. Was this fair or right? These days Technology Education can provide opportunities for learners to find out and learn about areas of the old curriculum from which they were previously barred. It can provide redress. Learners can cross the traditional boundaries of gender stereotypes. We have found that the differentiated project activities in this umthamo create just such an opportunity. If we want our learners to grow up to be independent people, then we need to ensure that they have chances and choices to learn about and participate fully in all areas of interest.

When we were doing some research for this umthamo, we really struggled to find technology texts focused on **Joining and Fastening**. When we went to libraries, we could find books on many aspects of technology and technological processes, but not one on Joining and Fastening! So the topic of this umthamo is quite unique.

When your learners have completed their research on different aspects of this topic, and shared their findings with one another, you will need to make some kind of record of their work. We suggest that you buy a large Scrap Book. You can find these in large stationery shops and supermarkets for about R15. These Scrap Books have stiff card covers, and 40 pages of strong stiff paper. They are durable, and you can stick in a variety of different things.

You could divide the pages of the book between the number of different aspects of Joining and Fastening that your learners research. Then you could make a selection of different items and writing to stick into your Scrap Book. When it is finished, you and your learners will have created your own Reference book on this topic. We think that other learners in your school will find this a very valuable book to consult. And your learners can be very proud of something that they have helped to make.



Unit 1 - Thinking about Joining and Fastening

It is good practice to think carefully *yourself*, in advance, about something that you want your learners to do, or that you want to do *with* your learners. This is where you

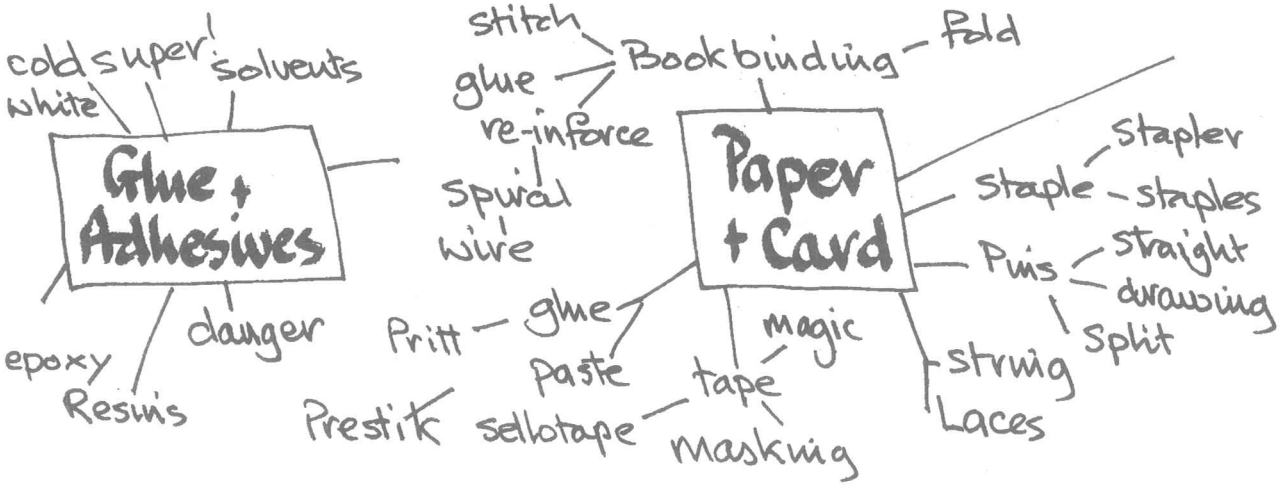
- review your *own* knowledge and understanding,
- get to know your own strengths and limitations, and
- start to think about related resources.

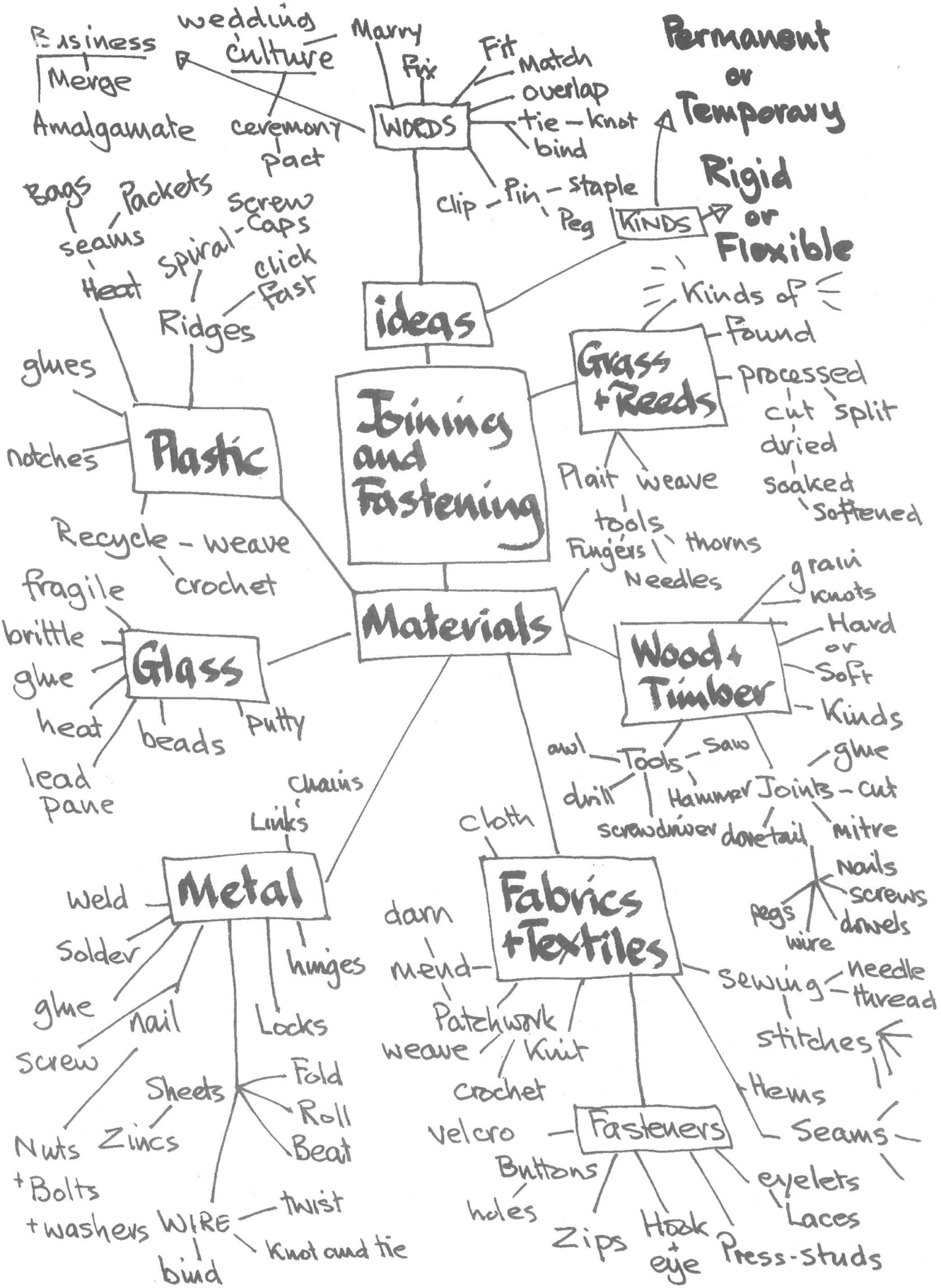
This means that you will be well prepared to deal with any eventualities. You will be in a position to make wise choices because you have prepared the field in advance.

Activity 1 - Brainstorming the topic

We would like you to spend some time on your own, or if you prefer, with one or more friends or colleagues. Brainstorm as *broadly* as you can, everything you know about "**joining and fastening**". Draw on experiences you had when you made or improvised things as you grew up. Think about how broken things were fixed or mended. Think of the kinds of materials everyday things are made from. Record what you know in the form of a mind-map, and make a different branch for each different kind of material. Then think of the specific *different* ways different things can be joined or fastened.

We have included a Content Audit on pages 8 to 11, as a guide for the kinds of things you could be expected to be familiar with. There is also some additional detail that could form part of the background knowledge that most primary teachers should have, in order to integrate Technology Education into other aspects of the conventional curriculum. We have based this on our own brainstorm when we were developing ideas for this umthamo. If you have time, compare our mind-map with yours.




Joining and Fastening
ideas
Materials
WORDS
Business
Merge
Amalgamate
wedding
culture
ceremony
pact
Marry
Fix
Fit
Match
overlap
tie – knot
bind
KINDS
Permanent or Temporary
Rigid or Flexible
Clip – Pin – staple
Peg
Bags
Packets
seams
Heat
Screw Caps
Spiral
Click Fast
Ridges
Plastic
glues
notches
Recycle – weave
crochet
Kinds of
Found
processed
cut
split
dried
soaked
softened
Grass + Reeds
Plait
weave
tools
Fingers
thorns
Needles
fragile
brittle
glue
heat
beads
putty
lead
pane
Glass
grain
knots
Hard or Soft
Kinds
Wood + Timber
awl
Tools
Saw
drill
Hammer
screwdriver
Joints – cut
glue
dovetail
mitre
Nails
screws
dowels
pegs
wire
Chains
Links
Metal
Weld
Solder
glue
screw
nail
Nuts + Bolts + washers
Sheets
Zincs
Locks
hinges
Fold
Roll
Beat
WIRE
bind
twist
Knot and tie
cloth
Fabrics + Textiles
darn
mend
Patchwork
weave
Knit
crochet
Sewing
needle
thread
stitches
Hems
Seams
Fasteners
velcro
Buttons
holes
Zips
Hook + eye
eyelets
Laces
Press-studs

Work through these four pages carefully **before** you start the **Key Activity** with your learners. Check what you *already* know, what you are *unsure* of, and where there are *gaps* in your knowledge which could be filled.

It is up to you to make sure that your own general knowledge and background content knowledge is up to standard. If you are still stuck after trying to help yourself, contact the DEP and we will try to work with the Eastern Cape Education Department to get you some help.

Thinking about Joining Wood

Soft and Hard Wood

Sold as planks, Poles and boards

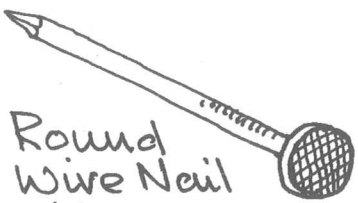
Wood can be joined with NAILS, SCREWS NUTS and BOLTS and GLUES.

There are many different kinds of wood - as many as there are different kinds of trees.

Plywood
Beaverboard
Chipboard
Hardboard

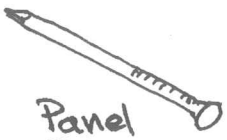
Do you know the names and uses of your local trees? Your school could develop a list of the local trees and their uses. This would be an interesting long term Project.

NAILS



Round Wire Nail
- cheap, strong
- Head cannot be punched below surface of wood.

Oval Wire Nail
- quality work.
- Head punched below surface for neatness - use filler.



Panel Pin
- For fixing boards or sheets of wood.

THINK
- How to hammer in nails
  - with NO damage
  - safely
  - straight

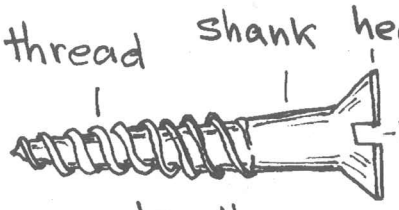
THINK ⇨ How to REMOVE Nails
- Claw hammer
- Pincers

safely with little damage

Screws

A stronger joint than nails

- the ridged spiral thread cuts into the wood pulling the joint together
- a suitable hole needs to be made in the wood with a drill (hard wood) or a bradawl (soft wood) before screwing a joint.



Countersunk woodscrew

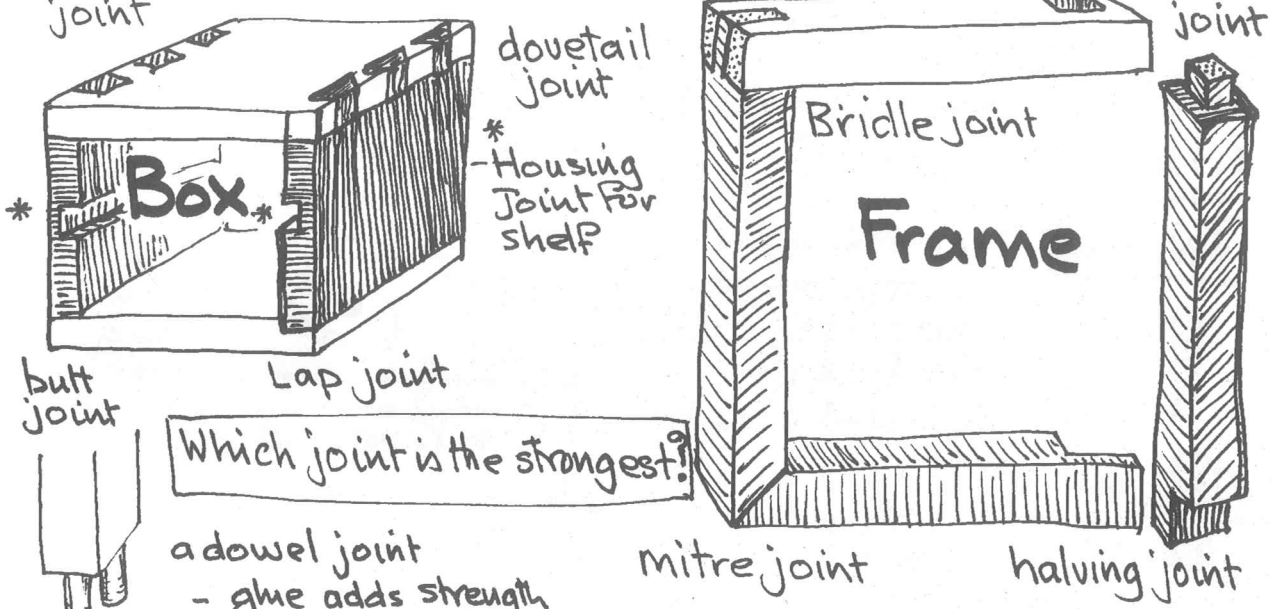
wood to wood joins + hinges + brackets

⇨ A round head screw is used to attach fittings to wood

A Pozidrive head needs a special screwdriver (Phillips) for a better grip.

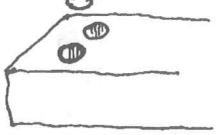
NOTE: Screws and Nails need to be 2x or 3x longer than the thickness of the wood they hold down.

Joints



Which joint is the strongest?

a dowel joint - glue adds strength



GLUE

- most wooden joints need glue
- some have to be clamped tight until the glue has set.

WOOD GLUES

PVA is the most common
- a white creamy liquid
- Alcolin

Hot Glue
You need a solid glue stick and an electrical glue-gun

Synthetic Resin Glue
- mix with water - strong + waterproof

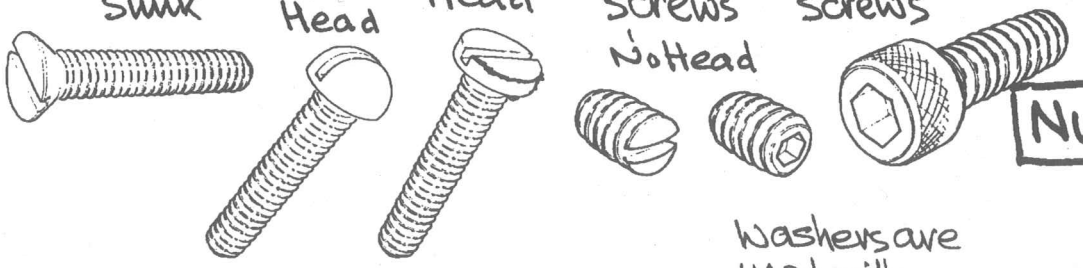
Joining Metals

Sheets of metal can be joined with self-tapping screws.

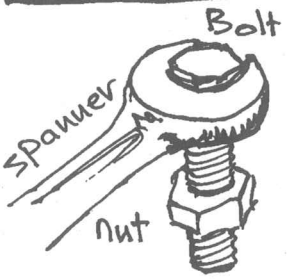
a self-tapping screw has a coarse thread. The pilot hole drilled in the bottom metal sheet is smaller, so the thread makes a strong hold as the screw is tightened

Other types of screws are also used Most metal screws dont have sharp points and can be used with nuts.

Counter Sunk | Round Head | Cheese Head | grub screws No Head | socket screws



Nut + Bolt



Washers are used with nuts and bolts.

a flat washer protects the metal surface

a spring washer prevents the nut coming loose

What can you find out about an Allen Key?

How can you fasten/tighten a hexagonal shape?

Rivets ⇨ to permanently join sheets of metal.

A rivet has a head and a cylindrical shaft. It is hammered through a hole drilled in both metals. The cylinderical shaft is then flattened rivetting the metal together.

Pop Riveting

A pop rivet has a metal rivet head and a steel pin. When the steel pin is pulled back a new rivet head is formed on the opposite side It is quick and easy, but not as strong as normal riveting.

Find out about Soldering and Welding from someone who knows.

These processes of joining use heat and are not safe for young children

⇦ CAN BE ⇨

Glues and Adhesives

Flour Paste

Rice Paste

Casein Glue
Add milk and vinegar so milk curdles. Heat and stir till soft lumps form. Strain the white lumps and add a teaspoon of sodium bicarbonate. Mix with a little water.

Fish and Animal Glues
Glues made by boiling up a soup of skins, bones and sinews. They are used for furniture and food can labels.

Petrol Glues
A little petrol will dissolve rubber to form a sticky glue.
It will do the same thing with polystyrene. As the petrol evaporates – the glue hardens.
WARNING!! very flammable!!

A Good way to find out about Glues is to read the labels on old Glue containers. Find out what you can about

PVA
* Recent inventions are pressure sensitive adhesives that are re-usable like PRESTIK and POST-IT Notes

Epoxy Resin

Acrylic Cement

Contact Adhesive

Rubber Solution

Faboric Glue

* WHAT ABOUT GLUES AND JOINING IN NATURE?
  - scars
  - broken bones
  - clots
  - gum
  - resin
  - scabs

* And what will we use in the future? Probably a substance hardened instantly and permanently by a beam of electrons or Ultra-Violet light.

DID YOU KNOW THAT THE SCIENCE OF JOINING IS CALLED

ZYGOLOGY?

After you have gone through the pages of the Content Audit, open your Journal and write the date. Then write down what you **feel** about what you have just done. Can you compare this Activity to a "warm-up"? Before a sportsperson starts to play sport, she warms herself up with some exercises. She also "psychs-up" for any match. This means that she prepares herself mentally for the coming task. Even a choir warms-up and has a pep-talk before a performance. The art or craft of teaching can also be seen as a performance, that requires skill, good preparation, and a clear head. The better prepared you are, the better you perform.

In your Journal, reflect on the extent to which you ever bother to "warm-up" and "psych-up" for your professional work as a teacher. What are the differences between the way things go when you are well prepared, and the way they go when you are not? Can you be "over-prepared"?

tshatisa

manyanisa

ncamathisela

dibanisa

hlanganisa

siyabambanisa

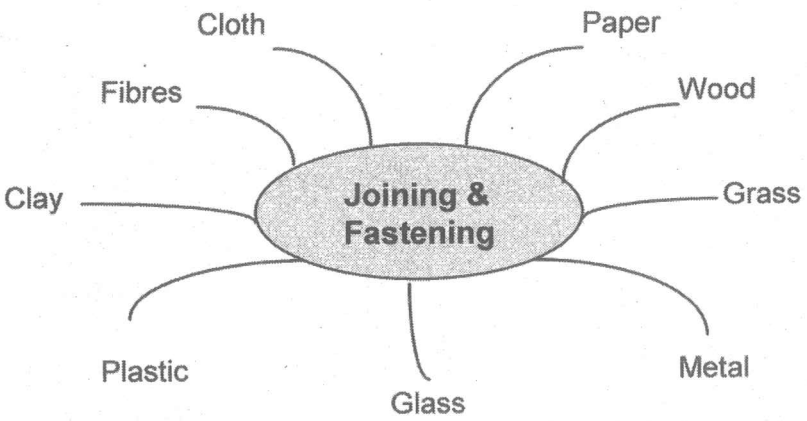
Activity 2 - Phase 1 - General Class Brainstorm

Focus on Topic

By now you should be used to sitting with your learners and discussing what they know about something, and building up a mind-map as you go. Think of your own way of introducing the idea. **Finding ways to join things** is an interesting technological problem.

When we introduced this topic to learners in various Grades, we asked them to think of all the words they knew which meant *joining* or *fastening*. We found that this worked very well with learners in Grades 3 upwards. The learners in Grades 1 and 2 struggled for a few minutes. Then a number of them held up both their hands, with the finger of one hand linked to a finger of the other.

Next, get your learners to name common materials that need to be 'joined' or 'fastened' when things are **made**. Make a mind-map of all the materials that they mention.

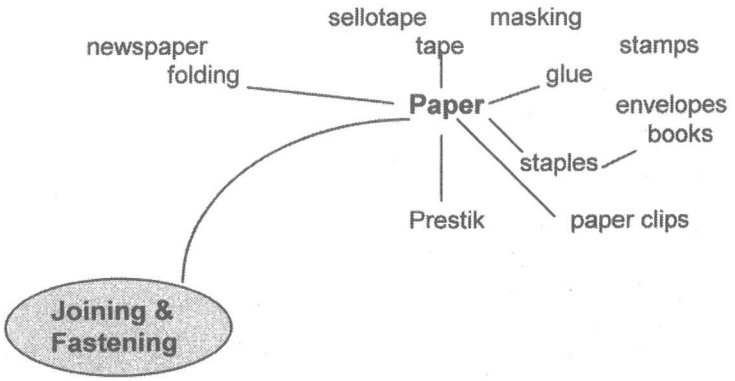


You may want to have stamps of the old and new type to show them. Some that need to be licked before being stuck on an envelope or postcard, and some that you can just 'peel off' and stick.

Then spend a few minutes developing a "word spider" of ideas around each type of material, where learners list the things they know that can be used to join that material. *(What gets used to join .....?)* Briefly discuss the **properties** of each material but don't record this.

For example, if you discuss **paper**, ask questions such as, *How can we join paper? What ways do you know to fasten paper together?* (Have some prepared questions in mind, as stimuli for certain ideas. For example, *"What do we use to fasten down the flap of an envelope before we post a letter? How does this glue work? How do you stick a stamp onto the envelope?"* But you don't want to pre-empt the ideas coming from your learners. So only use your prepared questions as a **last** resort.)

Think what else you will expect them to know about (Stapling? Paper-clips? Stitching? Spiral Binding? Lacing? Split pins? etc.) You don't need the word spider to be too detailed, because later a group will be responsible for taking it further.



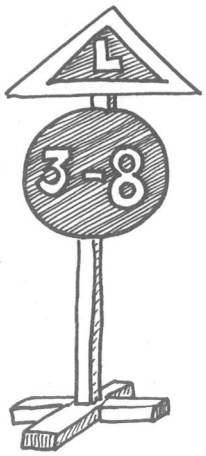
This part of the organisation for the class project should take less than 30 minutes. Finish off the 30 minutes by negotiating how you and the class plan to continue the project. Remind them to self-assess their work as they go by asking, "*How well are we working?*"

If you work in a school that is still locked into the old-fashioned idea of a rigid or inflexible timetable for primary classes, then use a Language period for this half-hour, and call it "Oral Discussion". You can even record continuous assessment oral marks for learners who participate keenly in the discussion and share their ideas effectively.

Now you need to explain to your learners what they will have to do next. You want to make sure that everybody is clear about what you expect of them, and what they will have to do.

A word spider is another way of describing a way of recording information like a 'mind-map', or a 'concept map'. Sometimes people also refer to these diagrams as 'webs', or 'trees'. The 'legs' of the spider show words or ideas linked to the 'body' word of the spider.

Start to think about the learning areas that will be covered in an Activity like this. (Language - to discuss and describe and compare; Science - the properties of material; Arts and Crafts, and Culture - how things are made, joined and decorated locally.)



Negotiating the Way Forward

Working with younger children

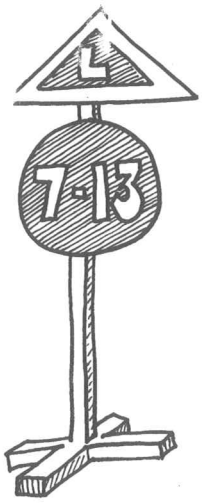
We suggest that first of all, you put the *Joining & Fastening* mind-map on the wall behind a table in a corner of your classroom. Explain that this is going to be the *Technology Table*. Then tell your learners that each week, you will help one group to collect and make samples to mount a display on this table. At the end of each week, the group which has been responsible for the display, will have time to talk about their display, and to explain why they have included various items. Then everybody will help assess how well they have worked.

Spend a few minutes negotiating which aspect of **Joining and Fastening** your learners would like to investigate first. When they have decided on a particular material, you will need to work with them to decide who will be in the first group, and who will be in the other groups. We would recommend that you involve your learners, no matter how young, in this decision-making. It is an opportunity to begin to apprentice them into democratic processes. It is preparation for life.

We suggest that you allow just one week for the setting up of a display, and the presentation. If you start off on a Friday with the initial meeting, your learners can do some research over the weekend. Then you can meet them again the following Monday, to find out what they have discovered, and to guide and focus their attention. On the Wednesday, you can meet again with the group to go over what they will do and say when they share their work with the class the next day, Thursday. This will mean that you can leave the display up for one more day, before taking it down. This will give the rest of the class another chance to interact with the items on display.

You will also need to involve your learners in making a record of what they have done. We suggest that as you remove one display, you paste the samples into a large scrap-book. This will then become a class reference book on *Different Ways of Joining and Fastening* which the learners will have made themselves. In this way, you are promoting a *"real"* culture of literacy (reading and writing) in your classroom.

Change the display each week and make a new display of ways of joining and fastening a **different material** with a new group of learners. Each time, make sure that you also involve them in the recording their research. This will then become an ongoing project over several weeks.



Working with older learners

First of all, explain that you will arrange to spend half-an-hour with each group over the next few days. Negotiate the time you will allow them before the groups 'go public' with their research. Outline how this will be done. You are negotiating the parameters of the task.

You have choices here. You can set aside a separate time on a separate day for each group to report back. Or you can decide on a special day when time will be made available for **all** the groups to have a turn at reporting back to the class. If you set aside a special single time, you can make more of the event and invite the Principal, parents or anybody else to attend.

At the end of this short part of the organisation, both you and the learners should be quite clear about what will happen, and how the project will be completed. You will have **arranged** a clear programme, or time-line, for the work. Write this up as a notice on the board or wall.

- Start Research - date
- Monitor Research - date
- Finalise Results of Research - date
- Prepare to Present - date
- Present - date
- Reflect - date.

All that is left to do is to share out (or apportion) the work, decide who will be in a group, and which group will tackle which material.

Ways to form groups

One Way

Start off by explaining that you want your learners to work in groups, and that you want to make sure that **all** the topics (or aspects) of the Joining and Fastening mind-map are covered. Mention the fact that if a group is too big, some learners may not do any work. Ask them how many people make a good group. (We have found that for a task like this, a group of four to six learners is best.)

Then give them just a few minutes to form groups and to decide which topic/aspect they would like to research. If you find that more than one group wants to do the same topic, you will need to negotiate with your learners whether this is a good idea. For example, if 4 groups want to research joining **fabrics and textiles**, but nobody wants to research **paper** or **metal**, try to encourage them to volunteer for a different topic.

Another Way

Alternatively, you could make a self-standing card for each topic, and set out each card on a different table (as a 'work station'). Then you could let your learners go to the table which has the topic that they would like to research. Again, you may have to negotiate that some learners volunteer to move to a different Technology Table if some aspects of the mind-map are not covered, or if some groups have too few members.

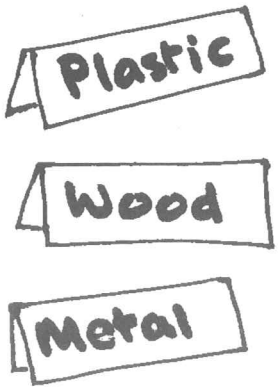
If you are working with very large numbers, as we know many teachers are, then you will probably have two or three small groups researching the same topic/aspect. This is not a problem. The groups will probably find that they discover some similar things about their topic, and other things which are different. Explain that when each group reports back ('goes public') and displays their findings, they will all learn more from each other.

A Third Way

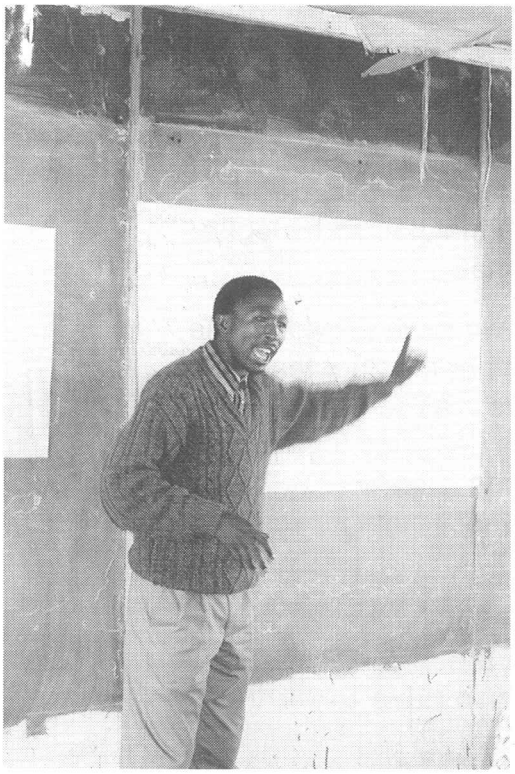
Of course, you could just tell your learners which topic they will research. But we have found that when learners select their area of research themselves, they work harder and put more effort into their research. They will also get more enjoyment from the project, and as a result will gain more. We would recommend that you adopt a more democratic approach. In this way, your learners will be learning life skills about how to participate democratically in life. They will also have an experience of making decisions for themselves, which will develop their independence.

Another point we would like to make is that it is important to have "mixed-ability" groups. In daily life we learn skills from others through participating at different levels. We may start off by just being an observer, or simply being interested in something. As we observe more, and begin to participate, we learn how to participate more fully. It's just the same with children. If they are given opportunities to participate with more experienced peers, they can also learn to do what others do. (In life, each one of us has different talents, gifts and skills. If we pool our talents, gifts and skills, we can tackle anything.)

Also, we have found that when children of different abilities work together, the apparently 'more able' are challenged when they are required to explain and share their skills with 'less experienced' learners. They are not held back. They are extended in another way.

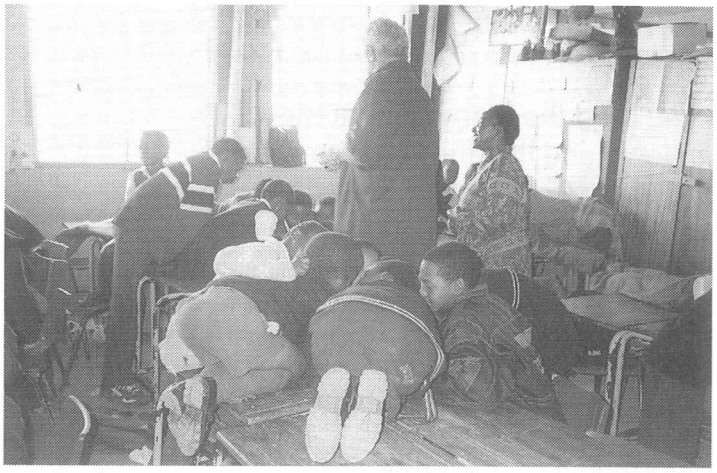


Douglas Barnes' research showed that when a so-called "slower" learner worked with a so-called "sharper" peer, the "slower" learner challenged the "sharper" child by calling for clarity! (Barnes, 1976:45-47)



The mind-map of the general class brainstorm.

Describing how something is joined.



Groups get going.

Starting to plan.

Unit 2 - Getting Groups Going

In this Unit, we describe carefully how a teacher can set the task, and help a group plan their research work. We also explain your role in helping learners to organise the things which they have found out, discovered and made, so that they can make sense of it all in a way that has some logical organisation and is somewhat systematic.

You will remember from Unit 1, that we have provided one option for younger learners, and another for older learners. The first option is designed for learners in a Pre-school class, or Grade 1 or 2. The second option is designed for learners in Grade 3 upwards. Teachers of Grade 2 learners will need to decide which option is the one most suitable for their learners.

To help you with the **Key Activity** of this umthamo, and to provide some supportive theory, we are including extracts from the work of Douglas Barnes. We have taken these extracts from the Appendix to his book, *From Communication to Curriculum* (1976). The Appendix is headed, 'Setting Up Small Groups'. But it is really about the **kinds of ways** children can work to gain and organise knowledge, and to construct meaning when they work in groups. It is also about how pupils use language to help them do this.

You need to realise as you read the extracts, that they form a sort of summary to his book, and that they often refer back to the actual content of different chapters. The extracts included in this Unit come from the first part of the Appendix. We will include another extract in Unit 4.

Douglas Barnes starts the section with the following statement,

> *My main thesis in this book is that the learners should take more part in the formulation of knowledge.*
> (1976: 191)

He goes on to say that it is his contention that teachers will achieve **better learning** if they **deliberately plan** for the way **language will be used** to **contribute to learning**. As you read this you are probably thinking, "But that is just what this B Prim Ed course has been driving at in so many of the imithamo!" And we would say, "Exactly! You see, the work of Douglas Barnes provides **theoretical support** for the approach that we are promoting in this course."

*If you ever manage to get hold of a copy of the book, **From Communication to Curriculum**, you should try to read it. In its time, it was a very influential book. 1976 was an important year in parts of the world other than South Africa, as well.*

I shall consider how teachers can plan their group work so as to encourage these strategies. The ways in which teachers can influence group work even when they are not present will be considered under five headings:

a – Feeling of competence
b – Common ground
c – Focusing
d – Pace
e – Making public

a. *Feeling of Competence*

The most successful discussions amongst those presented in Chapter Two were those in which pupils made an open and collaborative approach. While this is partly governed by personality and by relationships within the group, we all know from introspection that how we take part in a group's activities depends to a considerable degree on how we think our contributions will be valued. If the teacher-class dialogue is strongly shaped by the teacher's sense of relevance, this will affect the pupils' sense of competence in the subject, and probably their approach to small-group work. Uncertainty about 'what teacher wants' is likely to lead to the pursuit of consensus, and to a generally closed approach to learning tasks. The pupils are likely to guess at what the teacher wants instead of trying to make sense of the subject-matter. A first requirement for successful group work is that teachers, whenever they talk to pupils – individually, in groups or in full class – should show that they value their pupils' contributions. This does not mean accepting everything, but it does mean that every teacher should accept that part of his task is to *educate his pupils' sense of relevance* by encouraging them to make connections between new knowledge and old.

b. *Common Ground*

In all three of the tasks in Chapter Two the pupils had materials before them. It is essential to this kind of learning that pupils can set up hypothetical ways of organizing or explaining whatever has been put before them, and then return to the materials to see whether the hypotheses do help in dealing with the task, or whether they fail to account for something. Piaget's theories make one expect that children in the later stages of concrete operations will more readily make a leap towards complex and abstract kinds of thinking from a basis of visible and manipulable evidence. It was more surprising to find that all groups used the poem in a similar way.

The point being made is that if pupils are to participate actively in learning it is essential that the evidence on which their suggestions are to be based should be publicly available to them and to some extent under their control. (How one makes public the criteria by which they should determine how they are getting on with the task is a more difficult question.) Work can be based on apparatus, on pictures, on films, or on written materials, or it can be based on shared experience in or outside school. The task for the pupils is essentially to re-interpret experience by recoding it to one another and themselves: this will be impeded if the teacher leans too heavily over them in playing some of his roles – as provider of information or of criteria by which success or failure can be assessed. There is a delicacy to be observed in these parts of a teacher's work: if we overstep the mark, the children may merely learn to imitate, and not benefit from the knowledge we can offer by making it their own.

D.B. makes an interesting distinction between "an open, collaborative approach" and 'a closed approach."

What do I do?

OPEN THE DOORS OF LEARNING or LEAD LEARNERS DOWN A NARROW PASSAGE TO A CLOSED DOOR?

- How do I show that I value pupils' contributions?

I can smile, nod and show with my body language that I am impressed with what they say.

I must do what I can to make my learners feel 'good' about themselves.

So it is HANDS ON - MINDS ON - Practical Activities that matter most.

* The task is to re-interpret experience.

c. *Focusing*

Education is not a matter of throwing pupils into life at the deep end. We select areas of experience for our pupils, and try to help them to make sense of them. It is perfectly possible to experience air and never stumble across the idea of 'air pressure', which is a construction which men have put upon the way certain things behave. But it is all too easy to try to do the learning for our pupils, to try to by-pass the struggle to recode by dictating the adult version ready-made. If we focus the task too little, the children see no shape in what is before them, and do not know what to do with it, as witness those occasions when children, asked to compile an unstructured 'project', do so merely by copying extracts from books. If we focus too much, we interpose ourselves between the children and the experience we want our pupils to recode; all they can do then is to imitate us.

'Focus' as it is used here is a dual idea. It includes important parts of every teacher's responsibility in directing his pupils' attention: in this respect all three of the tasks set to the groups had been carefully chosen. It is necessary however to emphasize another aspect of focusing, and that is the part that pupils themselves can play. It has already been pointed out that one aspect of successful group work was that pupils were themselves asking questions, in some cases valuable questions, which had not been foreseen by the teacher. Now this too is a form of focusing, and all the more powerful as a means of learning in that it has been set up by the children themselves in a leap of imagination. This raises the question whether children could be deliberately encouraged to learn to ask questions; older pupils might even learn to be connoisseurs of productive questions. In a study published some years ago an American psychologist, Richard Suchman,[1] reported some success in improving the quality of primary schoolchildren's questions.

d. *Pace*

'Pace' is an aspect of the teacher's demands on the class and it is linked with the way critical standards are being applied. If a teacher is hypercritical and insists on every statement being well-shaped and every piece of writing well-organized, the use of language for exploration is ruled out. That is, if the teacher thinks of pupils' language in terms of *performance* instead of in terms of *learning*, he will not give them time for the reorganization of thought to take place. And where aspects of pupils' value-systems, of their feelings and attitudes, are involved, as often in the humanities and arts, this is all the more important. You will remember that Group II gained greatly from returning again and again to certain questions. Far from wishing to prevent this by hustling them along, we should be trying to devise methods of persuading other groups to do the same.

Of course, every teacher knows that it is equally unhelpful never to set deadlines to children, or never to demand a finished piece of work. Once again, what is required is a delicate balance between the two. The questions of setting up public standards for pupils to measure their work against, brings us, however, to the last of the five sub-headings.

Good Learning takes Time.

The man says....
"We select ....."
for our pupils...."

Yet here in South Africa somebody else, the syllabus or the Text Book make ALL the choices for us teachers!!!

So we have to help learners make the LINKS for themselves

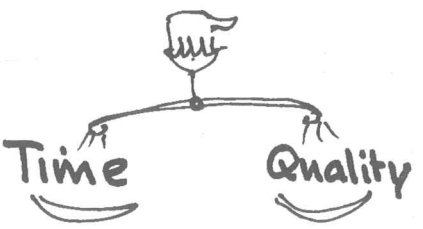
* We must take the 'Horse to water and hope that it drinks.'
or —
We make sure it is 'thirsty'!

Learners must ask their own questions as well.

What do I do to improve the Quality of QUESTIONS in my classroom?

* I need to learn to look much more carefully and deeply into what is actually happening in my classroom.

I have to balance



e. *Making Public*

Although I have stressed the part played in learning by the need to explain our meaning to other people, and therefore to see things from their point of view as well as our own, it would be a mistake to suggest that the effect of an audience is always the same. There is all the difference in the world between working with a few intimate friends to sort out some ideas and making these ideas public to a larger audience. It is not only that some of them may be unsympathetic or even antagonistic; the very size of a group of thirty or so makes a close relationship impossible. Without a close relationship one cannot be sure of shared assumptions, or whether what one says is earning acceptance and agreement. When older children are required to explain something in full class this is a challenge to them to foresee the extra information which they may need to give, and to order their thoughts in an even more explicit and 'public' way. Some cannot accept this challenge, and either keep silent or fail to adjust what they say to the larger group – partly from inability to imagine what needs to be said and partly no doubt from the anxiety resulting from social isolation.

There seems to be every reason to utilize this public demand as a means of urging pupils to organize their thoughts. A teacher is not the ideal audience: the fact that he knows the answer already tends to discourage explicitness, as we saw when the groups reported back to the history teacher. It is not enough merely to place pupils in a public position; first, they need plenty of opportunity to come to terms with their material, to explore the possible ways of saying things without having to pay too heavily for blunders. After that they will need some help in understanding the demands of a more public situation, to understand that they are no longer talking only to the teacher who already knows, but that they must communicate to classmates who may have hardly begun to think about the topic, or even to more distant audiences. This demand can become an instrument of learning.

The challenge will be to arrange such events so that everyone really participates. People should not just be acting the part of the audience, or acting the role of the presenter.

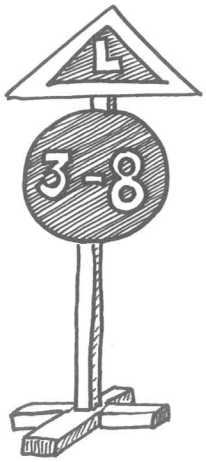
It needs to be....

Real Interesting, and even Exciting.

You will see from this extract that, in this part of your work with learners, you will be trying to do a few things as you guide each specific group.

- Firstly, you will be trying to ensure that they are confident (that they **feel competent** to carry out the task).
- Secondly, you will need to make sure that they **'own the task'**, that the work they do draws on their common experiences, they use things they can get hold of themselves, and that there is a shared understanding of the task - **common ground**.
- Thirdly, will your questions and instructions keep the learning **focused** without you dominating? Will they be able to use their own questions and ideas as a means to give their work a **direction**?
- Fourthly, you will need to balance the time a group of learners needs to find out, to share and to organise their thinking, *as well as* the need to get the task finished in a reasonable time. They must have enough time and support to do work that they can feel proud of. But, at the same time, they should not become bored with the task. So you need to judge the **pace** and **duration** of this work well.
- Finally, you will have to make sure that they realise that they will be **making** their thinking **public**. You will need to think about how you will help them to do this aspect of the work, so that they have a good feeling (a 'success' feeling) about themselves after they have presented their work.

You will see from the above, that an important part of the professional work of a primary school teacher is to make **good judgements** about how to get the balance of support and encouragement right.



Activity 3 - Phase 2 - Initiating the Research

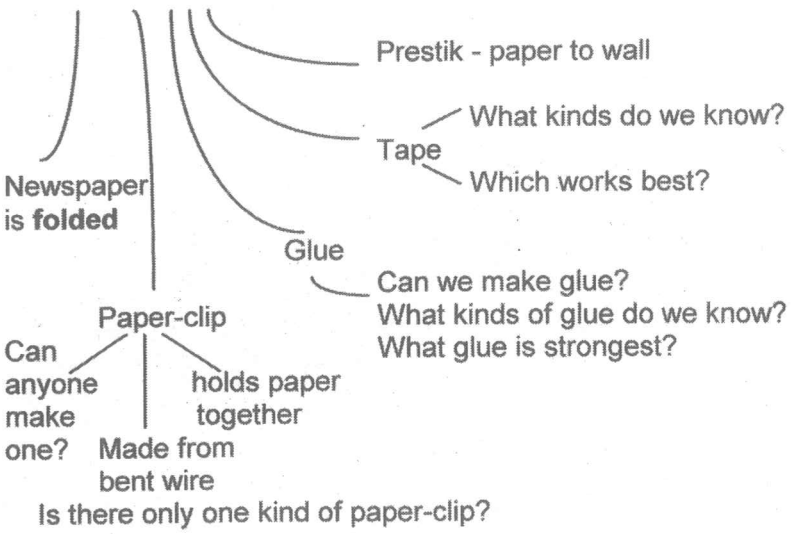
Working with younger learners

Find time while the rest of your class is productively occupied, and sit quietly with the group who will be responsible for the next display. We have written the Activity for a first group that has chosen Paper. You can adapt it to suit the topic selected by your own first group. The basic pattern of support will stay the same for each group.

We would urge you to work with just **one** group at a time. The fact is, that this is an opportunity for you to begin to create the ***zone of proximal development*** (ZPD) with your learners. You want to extend them, and to push their thinking and reasoning.

Begin by reminding your learners of their topic - perhaps it's *Paper*. Recap what is already written on the mind-map by recording the detail on a fresh sheet of blank newsprint (or cheap brown paper). Although many Grade 2s are confident about writing, they will have one thing less to worry about if you are their scribe and write down, or record, their ideas for them.

You could start your discussion something like this. *"Now your job is to get ready for a display. We are going to try to show all the different ways we can think of, and find out about,* ***how*** *to join paper to paper. We also want to think about* ***when*** *we need to join paper to paper. When do we join paper to paper? What are all the different ways we can join paper to paper?"* In other words, you want them to think about the skills involved.



When you have spent about 10 to 15 minutes in exploratory talk, explain that they need to bring examples of ways to join that material. Encourage them to bring *"real"* samples if they can. But if not, tell them to draw pictures of examples of ways of joining that material. Ask them to bring some samples and drawings the next school day so that you can begin their display of *joining and fastening*.

It would be a good idea to bring a few samples of ways of joining this material with you to this discussion. You will also need a self-standing card which says *Ways of Joining and Fastening* _____, so that you can start off the display right away.

At the end of the school day, spend some time making some smaller self-standing cards so that you can make a label for each example that your learners bring to school for the display. Then when they add their items and drawings, you can make an appropriate label.

Working with older learners

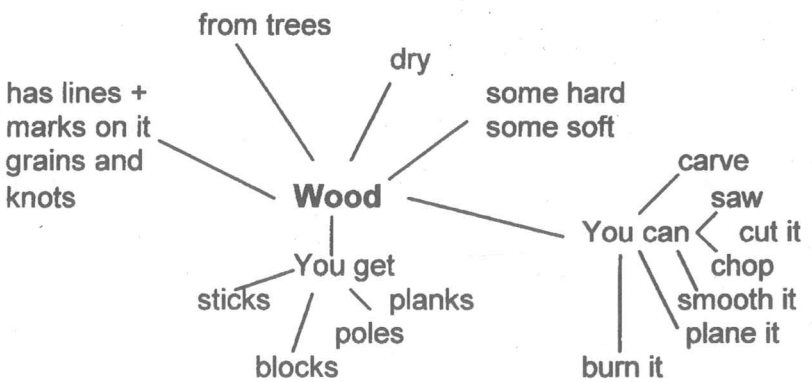
We suggest that you start by getting the group to explore the **properties** of the material they are researching.

(i) What is wood like? Where does it come from?

Ask your learners some questions to push them to think more deeply about their area of research.

- What is it like?
- How does it feel?
- What can you do with it?
- What are all the different ways you can join it?
- Which is the best way? Why?
- Is this <u>always</u> the best way? Why?

Make a concept-map of what your learners tell you. Write this information in **one** colour.



(ii) What do we know about how wood is joined or fastened?

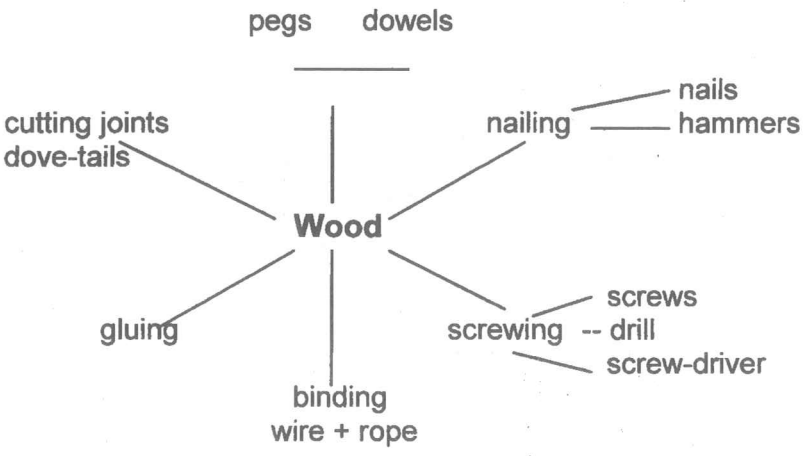
Now probe to find out what detail can be added. Write this detail in **another** colour. Now, when they give information, you as the teacher, can add **probing** questions. (You want to push their thinking further. You want to start to extend them, to challenge them, to begin to work in the ***zone of proximal development***.)

Pupil: We can use nails to join wood.

Teacher: Are all nails the same?
Perhaps we can make a collection of nails for our display. Where could we get different types of nails? Then when we see the different nails we find, we can look to see how they are different and try to think why they are different.

*Now the learners have to **compare** nails they know from experience in their mind's eye, and give you answers from their experience.*

Try to be systematic in your recording. Your learners should give **methods** (how) as well as tools (things used). We suggest you write these as follows. If they give you a tool, leave the space for the *method* in the concept map.



(iii) What can we find out? What can we collect?

After working for a while on extending the mind-map, start to list the things that need to be found out or collected as **evidence** of how wood is joined. Try to get group members to volunteer to be responsible for getting certain samples or finding out things. You can write their initials next to the item on the list.

Sample List

- What does a screw look like? Why is it like it is?
- What is the 'proper' method of screwing in a screw to join two pieces of wood?
- What do you usually do first? Then what? And then what?
- Who can we ask?

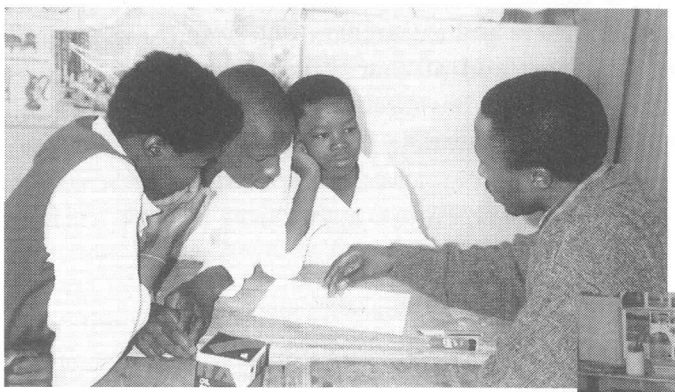
(iv) What can we learn to do?

Discuss the methods used to join the material. Ask if they know how we hammer in a nail safely and without causing damage. What is the proper method of nailing? Who knows how? Who can we ask? Does anybody have a relative who works as a cabinet-maker or a builder?

(v) Thinking in advance of how the information and material will be recorded and displayed

Before you finish off this first session with a group, try to get them to start thinking of how they will present the results of their research to the rest of the class. Recap what they will be doing in their own time. Point out that you want to meet with them again in a few days to check how things are going and plan how to finish up. Set a date, if you don't already have one on a time-line (see page 15).

In the next Unit, we will suggest how you can check the pace of your learners' research. We will also suggest a way you can help your learners re-focus.



Guiding a group.

Unit 3 - Monitoring the Research

This is where the group has a chance to

- report back on their initial finding out and pool ideas
- show what they have brought or made
- share their developing understanding
- demonstrate what they have learned.

And this is your chance as a teacher to challenge your learners to go further, to find out more, and to encourage them to refine and sharpen their ideas. Vygotsky's term, the ***zone of proximal development*** is a useful **theoretical** idea that fits in well with this kind of work.

In previous imithamo (Umthamo 25 - page 31, and Umthamo 27 - page 24) we have referred to this theory. Vygotsky's theory is important for teachers because an understanding of ZPD can make a great deal of difference to the ways in which we work with learners. So the writers felt it would be useful to think more carefully about this idea.

Before you begin to work with, and guide, your learners, you need to read the extract that follows. It explains Vygotsky's theory, in particular relation to language and literacy learning. In Activity 4, you are required to think about this theory and to think how it can become a way of working for you as a teacher.

Working in the Zone of Proximal Development

'Apprenticeships' in thinking, language and literacy

As mentioned at the beginning of this chapter, one strong influence on my work has been the work of writers and researchers who have examined the relationship of language (and of course literacy) to education. A second significant influence has been the work of Vygotsky (1978) and the development of this work by Rogoff (1990).

Rogoff (1990) uses the metaphor of 'apprenticeship' to describe how children learn. She suggests that children are apprentices in thinking:

> ...active in their efforts to learn from observing and participating with peers and more skilled members of their society, developing skills to handle culturally defined problems with available tools, and building from these givens to construct new solutions within the context of socio-cultural activity. (p. 7)

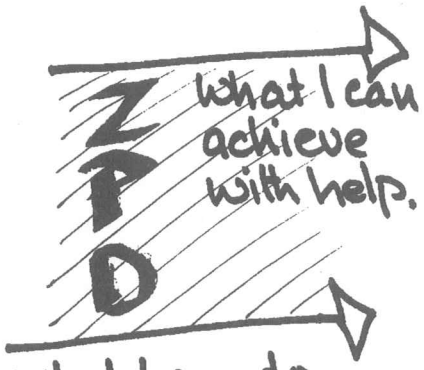
Rogoff's work in turn is based on the work of a number of psychologists whose theories are socially based (e.g. Vygotsky, Luria, Cole and Scribner, and Wertsch). Central to her concept of being apprenticed in thinking is the work of Vygotsky.

Vygotsky's (1978) theoretical work has two central concepts. First, that human activity has a tool-like structure, and second, that it is

First we learn to do, alongside someone, that which we later do alone.

embedded in a system of human relations. Vygotsky argued that these two major features defined the nature of human psychological processes. His theory suggests that higher order processes like literacy can only be acquired through interaction with others, which at some later stage will begin to be carried out independently.

Central to Vygotsky's assumption that learning moves from an initial form of guided learning to later independent learning is his concept of the Zone of Proximal Development. Vygotsky's (1978) ideas challenge traditional notions of developmentally appropriate learning. He proposed that there are in fact two developmental levels. The first he termed 'actual development', and defined it as 'the level of development of a child's mental functions ... determined by independent problem solving' (p. 86) – in other words, what a child can do alone at a particular point in time. The second, 'potential development', was defined as that which a child can achieve if given the benefit of support during the task. It is the ability to solve problems 'under adult guidance or in collaboration with more capable peers' (p. 86).



A learner can do more and better with support.

Vygotsky suggested that there is always a difference between these two forms of development and that this gap, the 'Zone of Proximal Development' (ZPD), indicates the functions 'that have not yet matured but are in the process of maturation' (p. 86). It is the ZPD that is critical for learning and instruction. He argued that learning creates the ZPD; it 'awakens a variety of internal development processes that are able to operate only when the child is interacting with people in his environment and in cooperation with his peers. Once these processes are internalized, they become part of the child's independent developmental achievement' (p. 90).

Rogoff (1990) points out that the ZPD is a dynamic region of sensitivity to learning the skills of culture, in which children develop through participation in problem solving with more experienced members of a group. Cole (1985) in turn argues that within the ZPD culture and cognition create each other.

Vygotsky suggested that teaching geared to developmental levels that have already been achieved will be ineffective, and that 'the only "good learning" is that in advance of development' (p. 89).

But how is this learning fostered, and what is our role in it as teachers? Bruner (1983, 1986) devised the concept of 'scaffolding' to explain this process. In explaining 'scaffolding' Bruner described the behaviour of a tutor helping 3- and 5-year-old children to build a pyramid out of interlocking wooden blocks. Bruner concluded that the act of scaffolding as observed was a process whereby the teacher helped students by doing what the child could not do at first, and allowing students to slowly take over parts of the text construction process as they were able to do so. The teacher controlled the focus of attention, demonstrated the task, segmented the task and so on.

* Learning is a Social and a Cultural thing

A 'scaffold' is a thing that is temporarily in place while something else is being built.

Teaching that doesn't challenge - will be ineffective.

What are the implications of ZPD? If I want to take account of this theory in my teaching, what must I do?

Teachers are more than simply manipulators and trainers. The interactions between parents and their young children are frequently cited (e.g. Snow, 1983; Painter, 1986) as the ideal models for learning. It is worth remembering that what is central to these interactions is a shared history, love, trust and concern for the child's right to construct his/her own meanings. As Bruner points out (1986, p. 132), we need to enter into dialogue with a learner in such a way that 'hints and props' are provided to move him/her through the Zone of Proximal Development. Learning is not about detached teachers taking control of learning away from students; it is about support, help and encouragement to reach new levels of understanding and skill.

The work of Vygotsky and Rogoff obviously has a number of implications for the teacher:

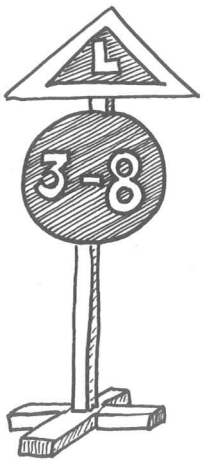
- Instruction and curriculum should be directed at a level just beyond the child's current level of development.
- The teacher should construct learning environments which permit students to attempt tasks with the help and support of the teacher and other learners – that is, create contexts for guided participation.
- Teachers have an important responsibility to observe the learning of students to determine their actual and potential levels of development, and to identify their Zones of Proximal Development.
- Teachers must create learning environments which provide positive demonstrations of literacy. Students need to observe other readers and writers using literacy in ways that are beyond the student's level of actual development.
- Teachers should create classroom contexts which permit the teacher as well as peers to build bridges between class members' present understanding to new understanding and skills.
- Classroom environments should be places which permit intersubjectivity to develop. Such contexts are probably best described as communities of learners, like that created by Susan Langbien
- Teachers must beware of the tendency to always make decisions about what is significant for learners within their classrooms. When teachers take total control of learning away from students, guided participation gives way to a new form of direct instruction. Bruner (1986) alludes to this issue when he asks:

> Is the Zone of Proximal Development always a blessing? May it not be the source of human vulnerability to persuasion ... is higher ground better ground? Whose higher ground? (p. 148)

* work to challenge, push and extend learners
* Choose tasks that will require help
  ↓ Can I think of an example?
* I've been observing learners a lot lately
* Think back to critical literacy in umThamo 25
* See Teaching as Building Bridges!
  ↓
  So now I am even an ENGINEER - not just a psychologist, a nurse, a social-worker, a parent, a policeman and a friend.

* I must find out more about this 'inter-subjectivity'!

(Psst! You've met it before on page 33 of umThamo 26)



Activity 4 - Phase 3 - Monitoring the Work

Working with Younger Children

Because one group will be going public each week with a **display**, this phase of your work, will be continuous over a few days for each group in turn. The group, or members of the group, should feel free to come to you whenever they like, with ideas or things they have found to add to the display. When they come to you, you can decide if it is appropriate to call the rest of the group or to work with the individual (or part of the group). If you choose to work with the individual, then you can see that there is sharing with the rest of the group later.

Perhaps a child comes to you with a 42-page exercise book and shows you the staples that join the cover to the pages, and hold the pages together.

Learner: Look, Ma'am. Here are two staples joining the pages and the cover of this book.

"These are staples" – tells her what he has learned on his own.

Teacher: Yes, good! What can you tell me about them?

Learner: They are metal and thin. On the one side there is one piece. On the other side, there are two pieces.

Teacher: Does that mean a staple is made of 3 pieces?

*The teacher pushes his thinking a little into the **zone of proximal development**.*

Learner: No, Ma'am. It is really one piece, with two ends that come through the paper, and they are bent together.

Teacher: Okay. So what is used to push the staples through the paper, and to bend the ends together?

Learner: A stapler, Miss.

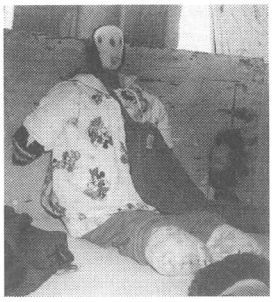
Now the teacher can decide if the child is ready to think about, or to find out how a stapler works, or she could decide to let him share what he has told her with others in his group.

After a bit of discussion, the next thing to do is to think about how the sample or joining idea will be displayed.

- What will be written on the label (self-standing card)?
- What can be written or drawn to explain about the way something works?
- What can a child plan to say when she talks about what she has found out?
- What kind of demonstration might be appropriate?

Then the work can be done and the item added to the display. In this way the display builds up gradually over a few days.

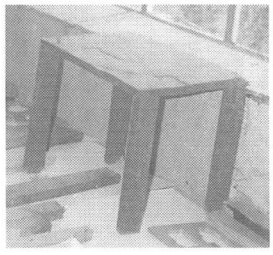
After a day or two, you will need to call the whole group together to talk about their progress so far. Are they happy with their display? Is anything missing? What can be improved on? Tell them that they have another day or two to get things ready. Remind them that you will all meet once more just before they present their final display to the whole class.

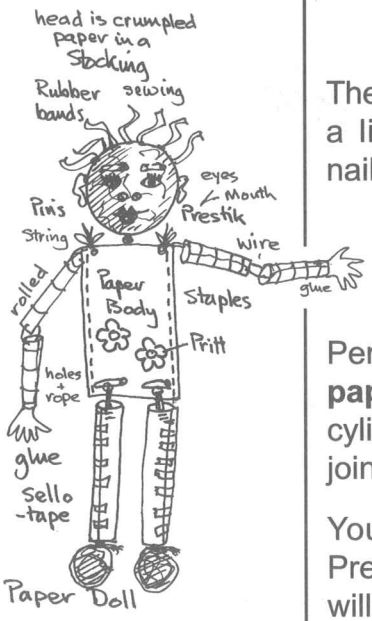


Then over the next day or two, continue to support and advise them as you have already been doing, as they add to and improve on their display. This means that their display will be substantial and interesting, and that they will feel proud of what they have done.

When we trialled this Activity at Vanani with the combined Grade 1s and 2s, two groups elected to make something specific that demonstrated how something was joined.

So a boy in the group that worked on **fabrics** or cloth, **stitched** a stuffed doll from fabric. He drew a face, and put on baby and doll clothes. So you could see examples of buttons and button-holes, hems, seams, knitting and crochet.

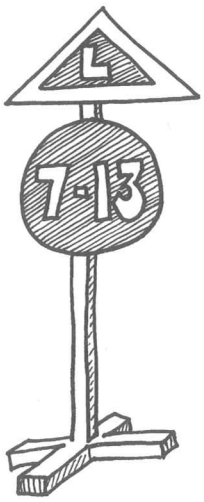




The group that chose **wood**, made a little table with scrap planks nailed together and painted it red.

Perhaps you could suggest that the group working with **paper** makes a paper sculpture of something by rolling cylinders and squashing paper into balls. Then they could join them to make an animal or a person or a plant.

Your role in helping them to finally **prepare** for the Presentation and for **supporting** the Presentation itself, will be outlined in Unit 4.



Working with Older Learners

Older learners will be more independent than younger learners. But it is still important for the teacher to keep in close touch with their progress. Older learners also need your care and attention to keep them **focused** and to maintain the **pace** of their work. Anybody who is learning, benefits from the time and attention of a 'more capable peer', or more experienced person. They will also need to be reminded that they will be responsible for 'going public' with selected aspects of what they have found out, and that their work needs to be organised and made clear in some way.

You will need to spend at least 20 minutes with each group about half-way between the initial **brainstorm**, and the date decided for **presenting**. You can arrange to do this while the rest of the class is busy with other work. Alternatively, you can set up a temporary roster to meet with the groups for a part of 'Long Break', or for a short while at the end of the day, or even before school. It is important that you give them your **full attention** for this period. You might also find that individuals will come to you with specific requests for help. You might also need to be alert to other learners who could benefit from a bit of your individual attention. Remember, you are the expert. You know your learners!

We suggest that you start by helping them to re-cap. Look back at the record on the mind-map of the original brainstorm. Then look back at the ideas for the 'Getting Started' phase. **Don't spend more than 5 minutes on this**. A re-cap is not like revision. It is not like memorising and regurgitating (spitting back) everything that has been learned. It is just a quick reminder of what the **common ground** is from which the learners can develop further ideas on which they can build.

Now give them about 10 minutes to share what they have done and found out. Remember the advice of Douglas Barnes regarding their **feeling of competence**. You need to show that you value their contributions. You also need to encourage them to link their new knowledge with the old, and to point out where they need to find out more. This is where you start to work in the ZPD.

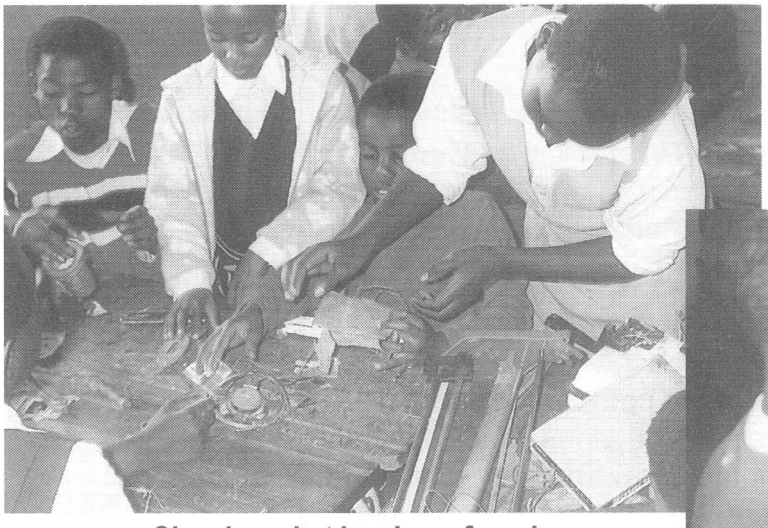
Because this is an 'open task', and they have been working collaboratively, you will need to be **flexible** and encouraging. But you will also be **focusing** their attention on specific things where they need to find out more or be more explicit (clear) about what they know or understand.

When we trialled this part of the Activity at Vanani Farm School with the combined Grade 3 and 4 class, and at Ngwevana with the Grade 6 and 7 class, we found that the groups had really 'gone to town' with the Activity so far. The Grade 3s and 4s of Vanani had brought a wealth of bits and pieces with them as samples and evidence of how their material was joined or fastened.

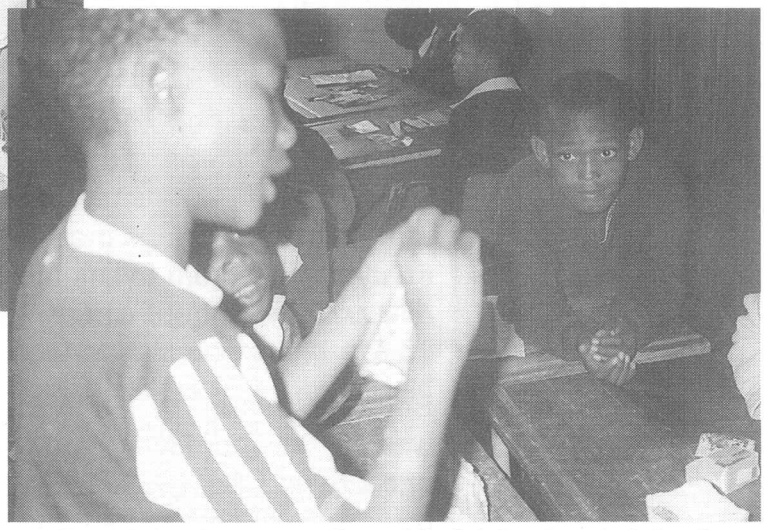
The photographs which follow will give you some idea of the things to expect.

As they talk, you will need to be helping them make decisions about what to be doing next. For example, who can they interview to find out more to tell them about welding? What questions will they ask? What samples will they look for? You might also suggest resources. What if you don't have reference books to find out more about different glues? You can suggest they read carefully what is written on the labels of glue containers. They should be able to work out a great deal, if they use their common sense.

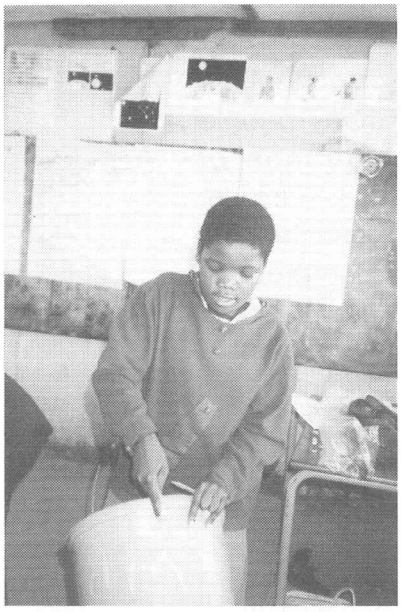
They will also need to start thinking about how they plan to record what they have found out and know. Will they make a poster? Will they do a display? What will they demonstrate? What will they talk about? In this way, you will be preparing the way for the next phase, which we will deal with in Unit 4.



Showing what has been found.

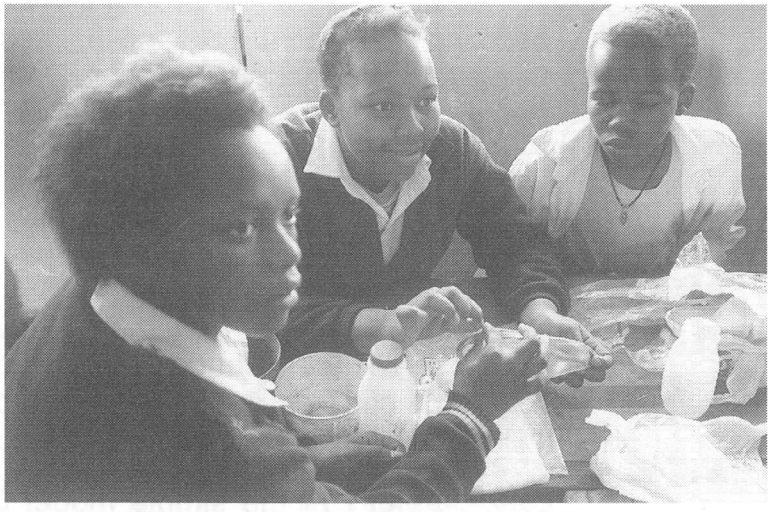


Explaining how a cardboard fruit juice box is joined, sealed, folded and glued.



This is how the handle slots into a notch on the rim of a plastic bucket.

The plastic things we found



This plastic pencil case has a plastic zip.

The teeth of the zip fit together like this!

Unit 4 - Presenting and 'Going Public'

Presenting is a very important aspect of work in schools. It is also an important preparation for life. So many people and so many jobs require public presentations of understanding. Salespersons, lawyers, ministers, politicians, business persons, etc are all required to make presentations. Many professionals share their knowledge at conferences and seminars where they present what they know. If learners are encouraged to 'go public' with their ideas and developing knowledge, a number of very important things happen.

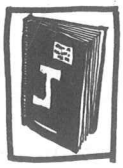
- They **think more** carefully about what they know.
- They **reorganise** what they think.
- They have to '**decentre**' and imagine what the needs of the listener or audience will be.
- The event gives importance and **adds value** to what they have been working on.
- They get important **feedback** to consider.

The teacher has a very important **guiding** and **mentoring** role in both stages of the process. That is, preparing and rehearsing the presentation, and the presentation itself. We are including a final extract from Douglas Barnes as a Reading for you to consider at this stage. In this extract, he outlines the value of 'going public'.

Activity 5 - 'Going Public'

Read this excerpt from the Appendix of *From Communication to Curriculum*. You should see that there is a strong link (**correlation**) with the approach we have been promoting as good primary practice in the DEP B Prim Ed course, and what Douglas Barnes writes.

Look carefully at the simple model Douglas Barnes proposes as a sequence of four stages. Compare that with the 5 Units of this umthamo. What have we done that is different? What have we done that is the same?



Work through the Reading carefully. Then, in your Journal, write your 'considered' response to this extract. By a **considered** response, we mean that you will spend some time thinking carefully about what you have read. You may even jot down some points from what you have read, and you will probably write down what your own thinking has been in response to what you note.

This means that it will be clear from what you write, that you have worked with the ideas that you pick up from the Reading. There will be evidence where you personalise

some of the ideas. (*'From my point of view .....'*) There may be things that you don't agree with. (*'Barnes says ..... But I believe .....'*) There may even be ideas you endorse. (*'I really like the idea of ..... because .....'*)

Classroom learning requires *a full range of uses of language*, from language for exploration at one extreme and language for a strange audience at the other. The former emphasizes the ordering of knowledge for oneself and the latter emphasizes the ordering of knowledge for others. (One might make a similar plea for a range of kinds of writing from the exploratory to the public.) I would go further than this and suggest that exploratory and public uses have a particularly significant interrelation in classroom learning. That is, if they are used together each strengthens the other. Exploratory talk at best enables pupils to reactivate passive knowledge and bring it to bear on a new task, to find their way about a problem and identify its contours or to set up hypotheses and plan techniques. Now there could be no better preparation than this for a more public discussion of the same topic, since everyone would be ready to participate, having already brought relevant information to mind and partly shaped it. Thus, exploratory talk can be seen as a *preparation* for *public* discussion.

On the other hand, as we have seen in our four groups, exploratory discussion can be so closed and unadventurous that the central problems of the topic are avoided rather than articulated. Here the public discussion may help. If, after time has been given to exploratory discussion, groups are told that they will be presenting their conclusions to the larger group, this has a marked effect on their discussion, which becomes turned increasingly towards the needs of others. Thus, it is possible to use the device of 'reporting back' (in some form or other) to project forward into group discussion new demands for explicitness and organization. But it is important in doing so not to swamp the sense of freedom that lies in ease of relationships and available time, and thus lose the first purely exploratory stage. As a simple model we might consider a sequence like the following.

1. *Focusing Stage* Topic presented in full class. Teacher focuses upon the topic, encourages pupils to verbalize necessary preliminary knowledge, and if appropriate makes a demonstration to form the basis for group work.
2. *Exploratory Stage* Pupils carry out any necessary manipulations of materials, and talk about issues which their attention has been directed towards.
3. *Reorganizing Stage* Teacher refocuses attention, and tells groups how they will be reporting back, and how long they have to prepare for it.
4. *Public Stage* Groups present their findings to one another and this leads to further discussion.

No doubt this sequence is both idealized and very familiar. What is new here is the emphasis on the changing functions of language in the course of the sequence, and especially upon the mutual reinforcing of the last two stages.

Perhaps it should be pointed out that 'reporting back' is being used here in a very general way. There are many possibilities, including the display of work done by groups in written form, by distributing duplicated copies or by a wall-display. It might even be argued that this more permanent written form should be seen as a fifth stage to follow the public discussion.

That means isiXhosa and English, Afrikaans and other languages, can all play a roll.

So I must allow at times for rough written work of the 'exploratory' type with less emphasis on spelling, grammar and neatness. Writing where it is the thought and ideas that count – not the presentation.

So reporting back can be used a a motivator, to get learners to think more clearly

So this is like the mind-map where we pool our ideas

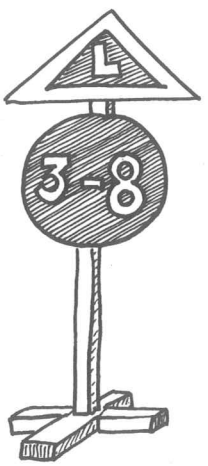
This often happens in my class these days - the learners are used to doing and talking.

I DONT DO ENOUGH OF THIS YET. ***

So in this case the completed book on JOINING would cover 'stage 5' because it would have writing and drawing. ('Barnes has forgotten drawing!)

This phase of work with learners will involve re-organisation, selection, planning order, allocating tasks, refining ideas, and may even include some elements of rehearsal. You will be involved in "communication skills development".

- How to stand
- What to say
- Who to look at
- What things or diagrams are needed to help make things clear
- Is everything ready?
- What still needs to be collected or prepared?



Activity 6 - Phase 4 - Preparing to Present
Working with Younger Learners

Sit with the whole group next to the display that has grown and developed over the last few days. Praise the group for their hard work, lovely drawings, and initiative in finding interesting and relevant items (*feeling of competence* - Barnes, 1976).

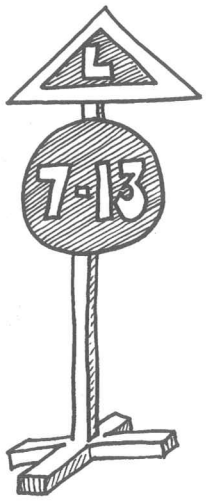
Now explain that later that day or on the next day, the whole class will come and sit around the display, and that the group will 'show and tell' their work. Ask, *"How shall we start?"* Who will talk **first**? What will they say?

Then go on to what will happen next, and who will be responsible. Give the learners a real sense of ownership here, if you can. This is one of the situations where the teacher has a 'delicate balancing act'. She has to help the learners decide what will be effective, but she also has to make sure that the presentation will hold the interest of the other learners (*common ground* - Barnes, 1976). She also needs to check they are not off-topic (*focus* - Barnes, 1976).

Go on until you have decided on a presentation format that satisfies the group and you. You will need to make sure that each member of the group has a meaningful and significant role to play. You might find that in some cases a pair of learners might want to share responsibility for an item of the public presentation. Finish off by asking if anybody wants to practice their bit.

Also remind them that the day after their Presentation, they will need to take down the display, so that the next group can start. Explain that a record of their work will be pasted into the special Joining Book. They may need to make some drawings of things from the display that cannot be pasted on to the pages.

At the trialling, one group of younger learners had made up a little song to start their presentation.



Working with Older Learners

Depending on the day and time of Presentation, you will have to make arrangements to meet with each group for a while beforehand. There are a number of ways of arranging this. You can do as you did with the monitoring, with a special time arranged for each group. Or you can set aside a specific period (or two) for the groups to work on their preparation independently. You need to give some general advice to all groups, and then you need to interact specifically with each group.

General Advice (Whole class/All groups together)

You could write up advice in the form of a large notice. Otherwise you can explain orally to the whole class at a suitable time. You could even let the class participate in a discussion where they work out what needs to be considered when they prepare to present.

Preparing to Present

To Consider:

- What languages and when?
- How to start. (Introduction)
- What to include. (Selection)
- Who will do what? (Roles)
- In what logical sequence? (Order)
- How to finish off. (Conclusion)

*This in itself is a Technology Education exercise. The class is solving a communication problem. They are designing an approach to present information. They are developing a **system** for 'going public' with their group's work.*

Guiding a Group

If you have also carefully read the suggestions for working with younger learners, you will see that this is a chance for you comment on and praise your learners' work (reinforce their *'feeling of competence',* Barnes: 1976). This will help them present with confidence.

Start by asking the group if they already know of any help or advice which they want from you. Do the best you can to help them with this. Try to incorporate them into the decision-making process. They can learn a great deal from this experience about working inclusively. You will be modelling a 'democratic process' in your classroom.

Remember, they are the ones that are going to present, so they really have to 'own' and understand what they want to do. If you are over-authoritative, or over-helpful, there is a danger that they will get confused and struggle when they have to present.

You can also use this as an opportunity to finally extend their work into their ZPD by giving advice and suggestions that challenge them to sharpen their thinking. An example of this comes from the trialling. When asked if she could explain how a stapler works for joining paper, a learner simply made the gesture of pushing down, using her hand with an imaginary stapler. It was clear that although she knew *what* to do to staple, she hadn't yet thought of *how* a stapler actually works. This is a chance to suggest that a careful investigation into the workings of a stapler might be in order. What are all the parts? How do they work? What do they do? What are they for? With somebody helping, she can find out more than she could on her own.

A very useful way to help a confident group that is planning to present, is for the teacher to role-play a potential audience, and to give feedback from an audience's point of view. For example, *"If you tell me [this] and [this] and then [this], and I think [that], will it be what you want?"*

Another way to help a group that works quickly, is to suggest the possibility of other more effective ways to achieve communication. For example,

- Can you think of a better way to tell them that *"the two parts of the wooden joint must match exactly before gluing?"*
- Would a careful diagram help you explain how the plastic handle is joined to the plastic bucket?

For groups that are slow to get going, you may need to spend time leading them through the process of planning step-by-step, giving guidance as they go. Make sure that both you and they know that **all** this help is only temporary. Another time they will be expected to do more on their own. You don't want your learners to become too dependent on the teacher.

By the time you have worked with each group, you should have developed a clear idea of what they will be doing and how it will happen. This should help you arrange a programme. You might decide to start with a fairly confident group, but to save the 'best for last'. Sometimes, if a really excellent groups starts first, then other groups can lose

confidence. You have to make quite careful professional judgements here. Thinking about this leads us into the next phase, which deals with how the teacher facilitates the actual presentation process.

Activity 7 - Phase 5 - Presentations

Working with Younger Learners

Begin by getting together the group which is going to present. Then gather the rest of your learners near or around the Technology Education table. Tell your learners that you want them to be a very good audience. Ask them to sit quietly, and to listen really carefully. Then when the group has finished talking about their display, they can ask any questions they have.

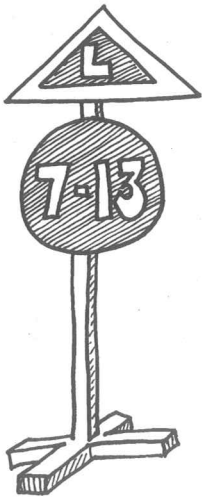
Then position yourself close to the table. Get the group which is presenting to stand in front of you. When everybody is quite quiet, let the group begin their 'show and tell'. Your role is very important. First of all, you can model how a good audience listens. Secondly, your role is rather like that of a 'prompt' in a play. You need to be very attentive to each part of the Presentation. If somebody forgets what they have planned to say or do, you need to act as a reminder, or a prompt. Thirdly, you need to provide support and encouragement.

Try to stay in the background, and to give your learners, no matter how young, a chance to speak and share what they have brought, found out and learned. If you feel that somebody has left out some important information, ask an open question which will prompt her/him to remember what s/he had planned to talk about. If you see the rest of the class getting restless, you may need to provide more guidance. But we know that young children are interested in what their peers have to say. We just have to set a good example of how to listen with interest.

When each person has had a chance to do her/his part, give the rest of the class a chance to ask questions, or even to make comments. Finally, thank the group for their hard work, and congratulate them on what they have found out and shared. Tell your class that the display will be up for just one more day so that they can have an opportunity to look at any of the items.

The following day, you will need to get the group to help you dismantle the display, and to decide what they can paste into the Joining Book. Where there is something which cannot be pasted in, make sure that somebody

makes a drawing to put into the Joining Book. You will also have to discuss any information or explanations which need to be written down and pasted in with drawings or samples. You will need to make notes of this discussion, so that the following week, you can make time to meet this group again to paste in drawings, information and explanations.



Working with Older Learners

If you have arranged that groups report back singly on separate days, then we suggest that you follow the advice as for younger learners (aged 3-8 years). If you have arranged that all the groups will report back at one time, then we have the following advice and suggestions.

If you let the children sit in their groups, or desks, in the classroom, you will find that they are tempted to continue with last minute preparations and adjustments. This has two clear negative effects.

- Their activity distracts the rest of the audience.
- They are not paying attention or gaining from the Presentation that is happening, so they can't participate in questions or peer assessment. This is clearly unfair.

The best way to avoid the above problems is to re-arrange the classroom so that there is a proper sense of audience. If you have tables and chairs, then the tables can be moved and stacked on one side of the room, or out of the way. The chairs can then be arranged in a way so that the class doesn't sit in groups, but forms an audience or congregation.

Make sure that you leave space between the rows and that there are clear aisles so that the next group can easily leave their places and move to the front to present. Also, the group that has finished should be able to find places in the audience with the minimum of fuss.

If you have old-fashioned single or double desks in your classroom, then you have more of a problem. In many primary schools all over the world, children are happy to sit on the floor for assemblies, or on the 'carpet' to form an audience. We know that in many of our schools, dust is a problem, and the floors are not easy to keep clean. And big carpets are expensive.

We saw a wonderful idea at Sinako Primary School, near Bisho during trialling for an earlier umthamo. Each learner brought a little mat of his or her own, made by a parent, grandparent, or relative. When the children sat on the

floor, they sat on their mats so that their clothes were not harmed. The mats could be made from old carpet, patchwork, reeds like *ukhuko,* or leather skins.

If the children are to sit on the floor, you still need to see that they are not too crowded and that there is space for movement as groups come up to the front or return to their places.

If you invite adults to be part of the audience, you need to think carefully about where you seat them, and how you brief (prepare) them. Our advice would be to sit the adults to **one side**, so that the view of the learner audience is not blocked. Secondly, explain to them that the children will see the adults as role models. So they should carefully model the way an attentive listener behaves.

We suggest that the class teacher sits facing the audience at the front, and to one side of the group presenting. There should be a table for any samples or aids and a clear space on the wall behind, or on an easel for any diagrams or pictures. There should also be enough chairs on the 'stage' for the presenting group so that each member can sit facing the audience as they wait their turn.

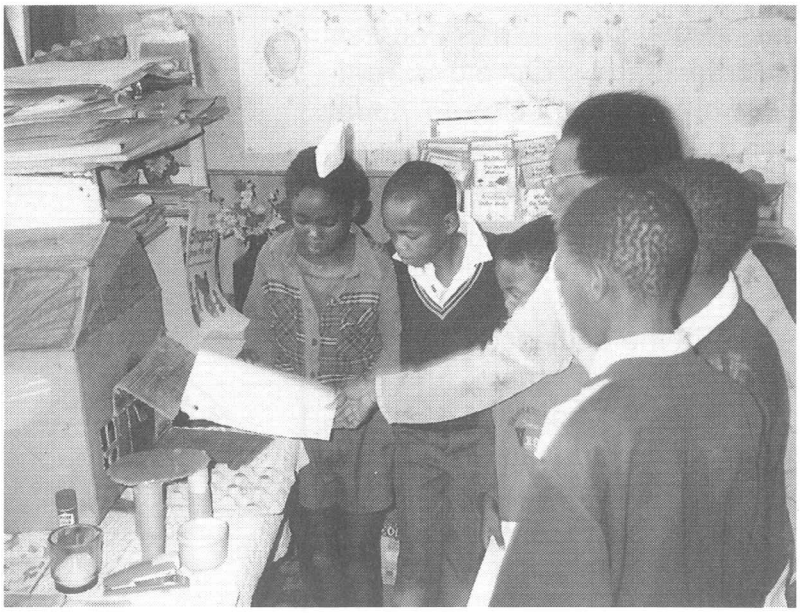
During the Presentation

Your role is to act as Master of Ceremonies (MC), to time-keep, and to see that things run smoothly. You can also act as prompt, helping learners who are stuck or uncertain. And, you can act as Chairperson allowing a few questions at the end of each presentation. The most important thing is to see that everyone has a 'success' feeling.

At the end of the session, thank everybody, or brief a learner to do this. The ideal thing is to let the learners take increasing responsibility for special events like this. In this way, such events can become a more regular part of normal classroom practice over time and in the future.

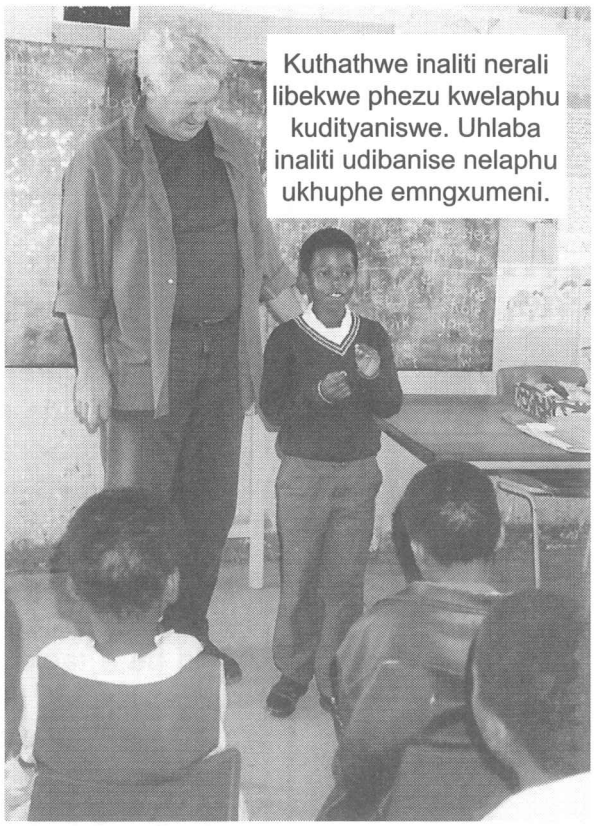
Don't forget to remind everybody that they need to reflect back on the experience of brainstorming, investigating, researching, preparing and presenting. Explain that they will all be assessing the work. Remind them to keep everything and to start thinking about what will get pasted into the Joining Book as a record of their work.

When we trialled the report backs we were very encouraged with what we heard and saw. We are certain you will find the same thing. On the next 3 pages we have photographs, transcripts and descriptions of some of the trialling Presentations.



Who will talk first?

Iqhosha - Sandiso



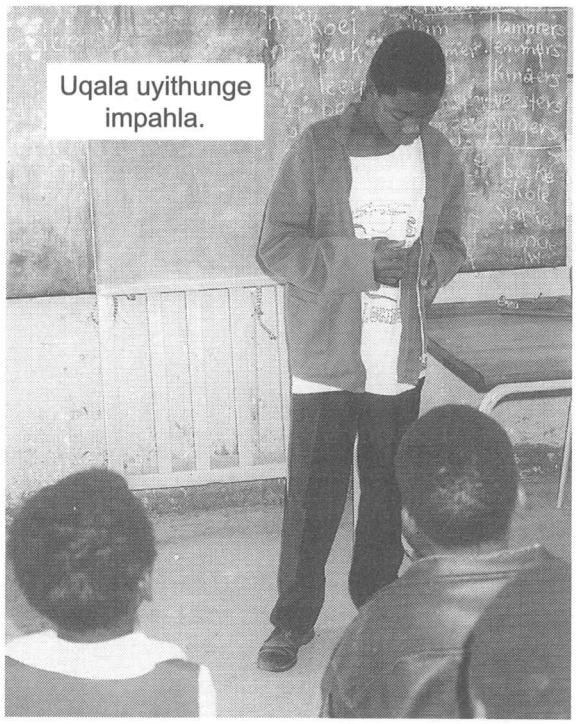
You take a cloth, and you put a button on top of the cloth, and you join the two together. You put the needle through the button and the cloth, and join the button to the cloth.

Iplanga - Thembisa

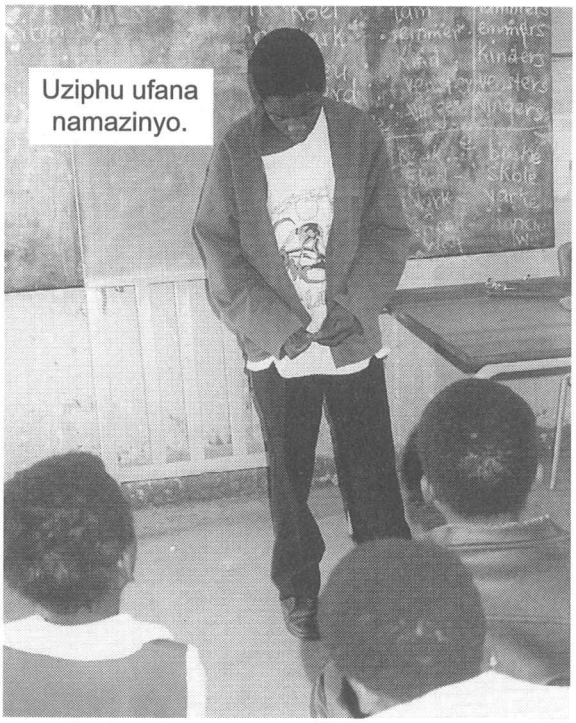
If you are going to use a screw, you first make a hole. Then you fit in a screw and screw it in with a screw-driver until it's flush (level with the surface of the wood).

You can join wood with nails. First you take the nail and you join it to the piece of wood. And you hammer it into the wood.

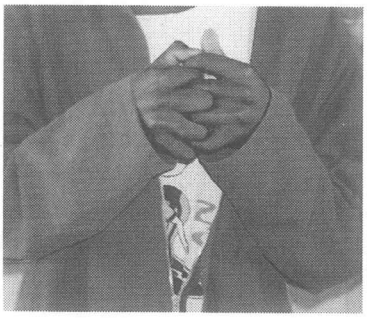
Iziphu - Siphelo

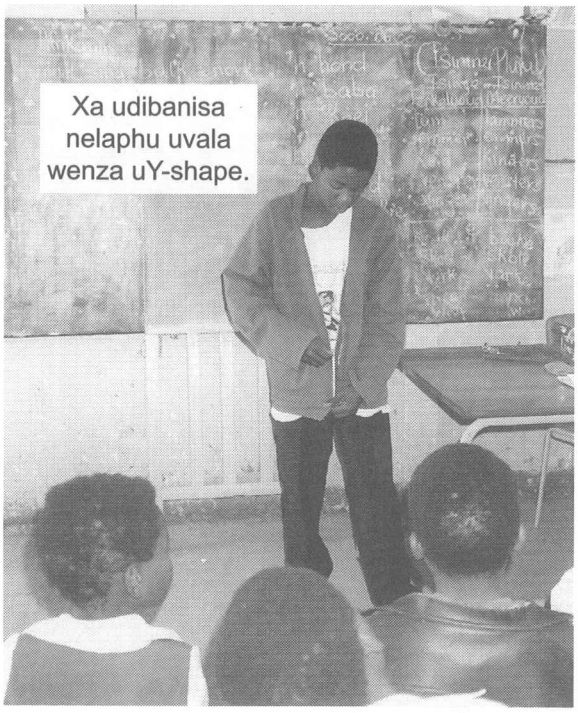


You first sew the zip into the piece of clothing.

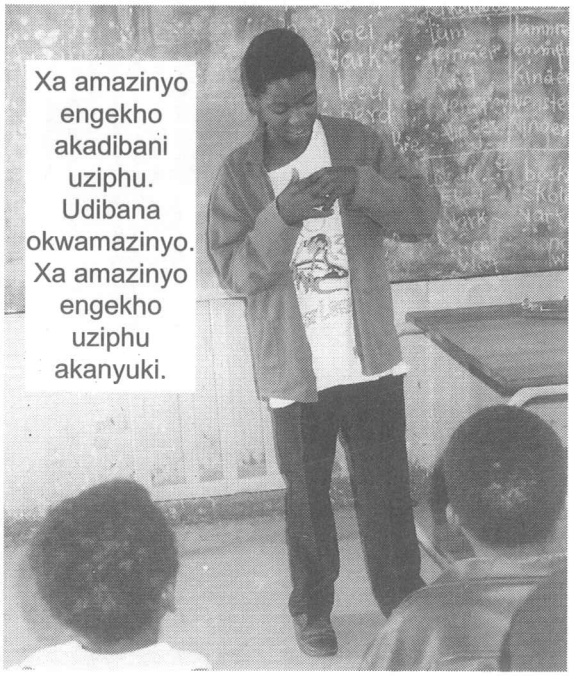


The zip is like a set of teeth.



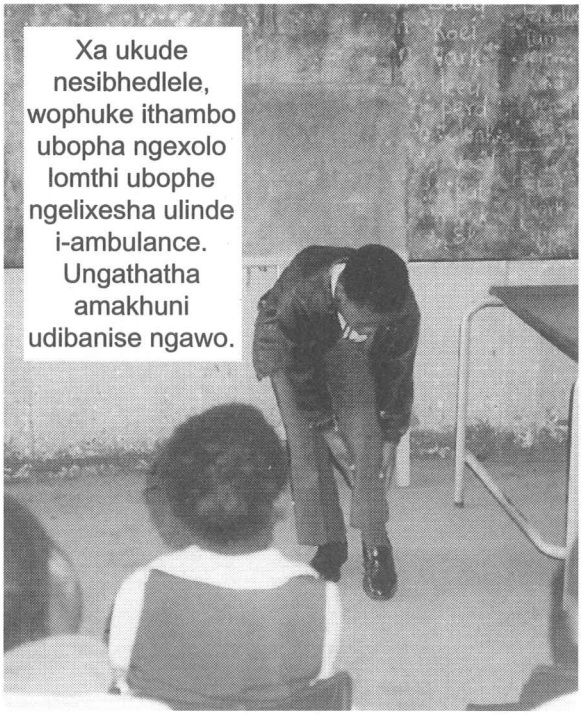


And when you join the two sides of the zip together, it closes in a Y-shape.



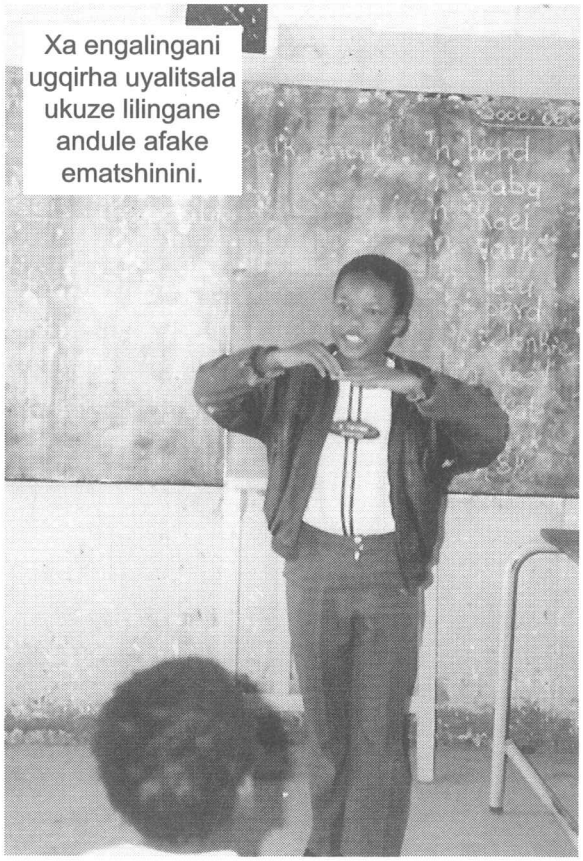
If some of the teeth are missing, then it doesn't join. It closes like teeth. It won't go up if some teeth are missing.

Bones - Yonela

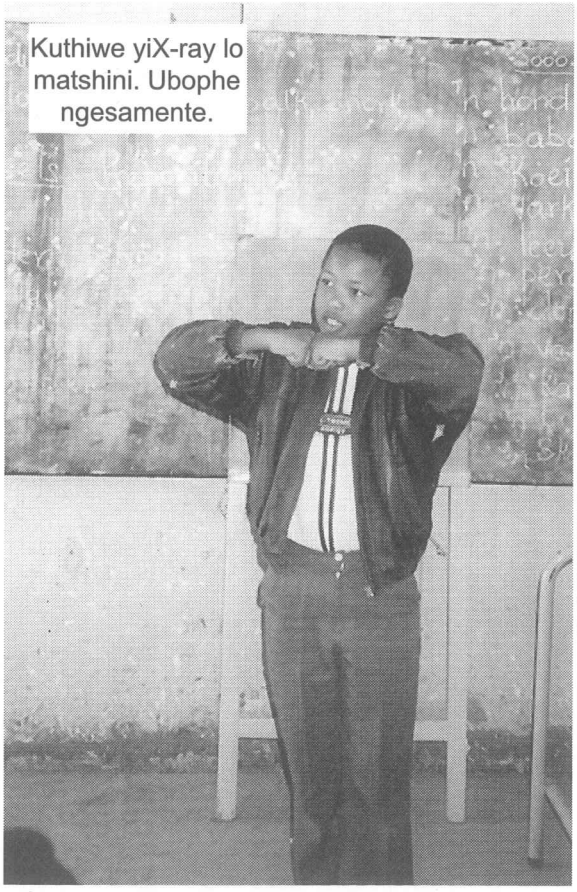


If you break a bone, and you're far away from a hospital, you can use the bark of wood while you are still waiting for the ambulance. You can also use two sticks and tie one on both sides of the broken leg.

When a bone is broken, the parts slide over each other and overlap. When you see an overlap, you know a person has broken a bone.



Then the doctor has to pull the bones apart so that they don't overlap, and so that she can match the parts.



Then she X-rays the bone. Then the bone is bandaged with plaster of paris.

Unit 5 - Assessment

> *".....children fail when they lose confidence in their own ability to succeed." (Meek, 1991)*

As we have outlined the approach suggested for this aspect of Technology Education, we have tried to show how the teacher can **support** and **guide** the learners so that the outcome is a '**success experience**' for everybody. This means that nobody should be assessed as 'failing' or 'weak' on such work. We are going to expect that all assessments come in the 'good', 'very good', 'excellent' range.

We feel that an important aspect of **continuous assessment** is that it helps primary education to move away from a negative approach to marking - looking for what is wrong and putting red crosses. (Labelling children as 'failures' from an early age must have a very negative effect on their self-esteem and motivation).

Eliot Eisner, an educationalist from California, has made a strong case for what he calls *'connoisseurship'* in educational evaluation. The term *connoisseur* is usually used in relation to a person who can make judgements of what is 'good' about food, wine, art, or drama. This is in contrast to a critic who will focus on what is bad or hasn't worked in a production or product. Perhaps we should think seriously about this wise person's advice.

Take out your Journal, and try to reflect on past experiences of your own, where you have been praised for what you did well. How did this make you feel? What was the outcome of being praised? Then contrast this by thinking of times when the feedback you got was negative or critical. How did you feel then? And what was the effect of the criticism?

If you have worked with younger learners (aged 3 to 8 years), or your older learners have reported on their work singly, at different times, then we suggest the following approach. Straight after the presentation, or within a short time afterwards, you need to spend time with the group concerned and the rest of the class. If you don't want to work with the whole class, you could ask for a group of volunteer peers to help assess the work and Presentation of the group.

Conduct a brief discussion where the group and their peers comment on the following:

- What was good?
- What worked really well?
- What could have been a little better? How could the work or Presentation have been improved?

Then vote on an overall general assessment as 'Good', 'Very Good', or 'Really Excellent'.

If you worked with older learners, and each group had a turn presenting at a single event, then you will need to have a more structured assessment session. Perhaps you could also include specific criteria. We suggest that you prepare an assessment table that looks something like the following, which can be written up on the chalkboard, or on a large sheet of paper.

Assessment Table

Group	Research Findings	Samples	Description and Demonstration	Overall Assessment
Paper				
Wood				
Plastic				
Metal				
Cloth and Fabric				
Paper & Card				
Bones				
Grass & Reeds				
Clay				

Then each group's work gets discussed in turn by everybody for a few minutes. A comment is agreed on, by consensus, for each column. Once the columns have been filled-in for a group, you might want to spend a few moments where suggestions are made as to how the work of a group could be improved on in the future. What could they do better next time? This sort of advice could be considered constructive comment or criticism.

Hand-in Research Assignment

You will have read in the Introduction that this umthamo requires you to complete and hand-in a **written Research Report**. For this Report, you must write a detailed study of one group's progress, as well as an analysis of the way in which you provided guidance and help, or support, for that group.

The work with other groups should not be neglected, and you will need to show evidence of their work and your interactions with their work, at the **Portfolio Presentation** and **Moderation** at the end of your second year of part-time In-service study towards the B Prim Ed degree.

Assignment - Investigation and Presentation in Technology Education

Write a detailed description of the progress of the work of a group of learners as they investigate the technological process of 'Joining' with regard to a specific material, for example, Paper. Your Report should include a section on each phase of the group's work

- Brainstorm
- Setting the Task
- Monitoring
- Planning to Present
- Going Public
- Assessing

Each section should not be more than one A4 page. And each completed section should include an attached page where you reflect on your role as a teacher in *supporting* and *extending* the efforts of the group. This should be written in a *different* colour so that there is a clear distinction between your **descriptive** writing (blue or black pen), and your **reflective** and **analytical** writing (red or green pen).

Criteria for Assessment

	Description of Learners' Work		**Reflection on Teacher's Role**
W	Not clear, haphazard, disjointed and very brief.	**W**	No evidence of reflection or analysis.
OK	Reasonable attempt at describing, but not always clear.	**OK**	Some evidence of reflection, not supported by logical argument.
G	Clear and thorough description that paints a clear picture of the learners' progress.	**G**	Sound reflection, well supported by logical analysis.
VG	Very clear and thorough. Very interesting to read.	**VG**	Insightful and challenging reflection of considerable depth.
E	Outstanding work.	**E**	Reflection of an exceptional quality that is thoroughly supported, and shows professional integrity.

Conclusion

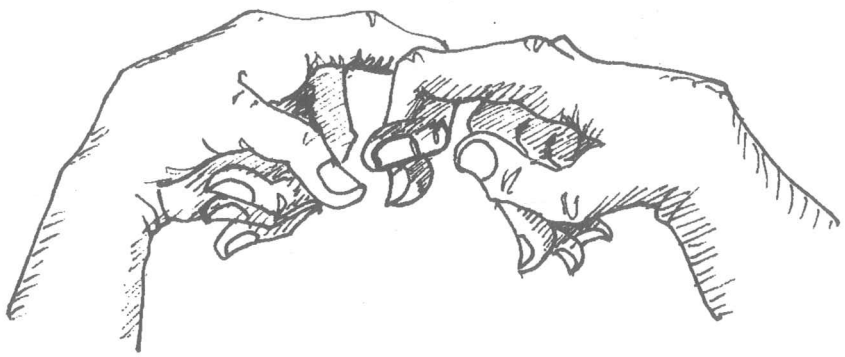
In this umthamo, you have had the experience of working with your learners on a differentiated group work project. With guidance, you have taken your learners through the phases of

- brainstorming and finding common ground
- starting to research and investigate
- monitoring
- preparing to present
- going public, and
- reflective assessment.

You have spent time reflecting on this process and the outcomes. You have written a careful, detailed report on the work of one particular group. And you have reflected on your role in this process as you led your learners into the *zone of proximal development*. We hope that this experience will have given you an insight into the values of getting your learners to work in groups on *different* tasks. And we hope that the theoretical ideas of Barnes and Vygotsky support your further attempts to implement an approach like this.

You will have noticed that an important aspect of Technology Education is that it provides opportunities for learners to cross the traditional boundaries of gender stereotypes. Remember the boy at Vanani who made a doll? And the girl who researched ways of joining wood? It is exciting to see how easily and naturally learners will research aspects of life traditionally considered to be the province of the other gender. This is very important if we are seriously committed to equality of opportunity and access, regardless of gender.

This is the last Core Learning Areas umthamo of the first half of the Fort Hare B Prim Ed. We hope that on reflection you are really glad that you enrolled for the course, and that you are looking forward to starting the last half soon. In what ways has this course changed you as a teacher?



UNIVERSITY OF FORT HARE
DISTANCE EDUCATION PROJECT

CORE LEARNING AREAS COURSE
Technology Education

4th Umthamo
Differentiated Group Work - Joining & Fastening
First Pilot Edition - 2000

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Acknowledgements

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We would like to thank Lukhanyo Konqobe and his learners from Ngwevana Farm School, as well as Kholiwe Mweli and Nomalungelo Spelmandla and their learners from Vanani Farm School for helping us trial the Activities in this umthamo.

Without the patience, expertise and help of Ron Kahn and Ricardo Stevens of L Harry and Son, we could not have completed this book. Thank you.