

ACTIVITY ONE: SWEET WATER AND EARLY NGUNI PEOPLE

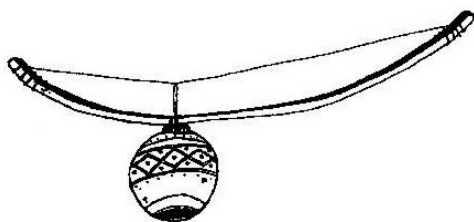
This **SOCIAL SCIENCES : HISTORY** reading and questioning activity looks at early Nguni people of southern Africa and their commonsense ways of collecting and storing “sweet” water.

(In the story that follows, comments and scientific observations are in brackets and italicised so that the learners can see the practical wisdom behind some water collection myths and techniques of the past).

Before the time of the Zulu King, Shaka, sweet water was called “amanzi amnandi”. Shaka’s mother was called Nandi and it is said that because it was not considered respectful to use the queen mother’s name in this way, Shaka referred to sweet water as “amanzi amtoti”. *(This is how the town of Amanzimtoti, south of Durban, got its name)*. Today both terms are used and many people of Nguni origin will sniff, smile and hold up “sweet” water, collected from a river, spring or well for their daily household needs. *(Water quality scientists today still have people smell and taste household water. Human senses give a refined indication of whether water is good and clean and fresh).*



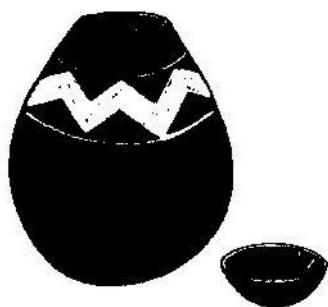
Historically, water was usually collected in areas where people could hear it running over stones or dripping down rocks *(well oxygenated water supports natural biological cleansing processes)*. If a spring was for human use, it was protected by a circle of rocks with a small outlet. Cattle drank elsewhere.



An area nearby was cleared and the site soon became a meeting place for young people. Young men would hang around these water collection sites, playing musical instruments and admiring the maidens who came to collect water. The girls would saunter along slowly and gracefully, singing and flirting. Water collecting was rarely seen as a tiring or boring chore because of the prospect of courtship!!

A water source would always be approached with care so as not to frighten crabs and other small water animals. When disturbed, their movement would stir up sediments and the collector would have to wait for the silt to settle. The surface film was brushed aside for “sweet water” to be collected. *(Sediments and surface films have higher bacteria numbers than the middle waters of pools and rivers. Today scientists take water samples below the surface film,*

taking care not to suck up sediments. In this way, scientists can get consistent and reliable measures of bacterial contamination).

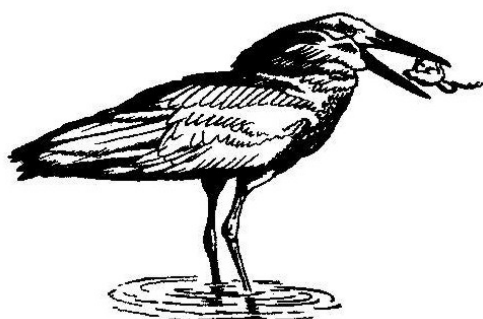
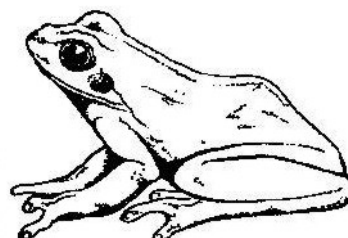


Clay pots were filled with water and covered with a collecting bowl, a piece of skin or a mat made from incema (*Juncas kraussii*) grass. The water would thus stay cool and fresh. (Water evaporating through the sides of a porous clay pot cooled the contents. Most water bacteria cannot reproduce in cool, dark conditions. Some micro-organisms envelop themselves in a calcium secretion in the pores of clay pots. Scientists spoken to were

uncertain about the detail of these issues but it is of note that, in earlier times, great care was taken to scour out a calcium-like scale in water pots. Also of note is that when the grass “lids” and head rings for carrying pots became old they were simply thrown away and new ones were woven. Discarded lids did not pollute the river like today’s bottle tops and plastic waste).

There were many other customs and traditional practices surrounding water. Children were warned that urinating in a river would change them to the opposite sex! (This myth was probably sufficiently frightening to prevent people urinating in streams and rivers. This would have limited a disease like bilharzia. The bilharzia parasite is passed on from human urine and faeces to small water snails. From these, its life cycle takes the disease back to people through river water).

Nguni water collectors say that where there are frogs, one does not find sweet water. Frogs are eaten by hammerkops (*uthekwane*, the “lightning bird”) and the prospect of collecting water while being watched by a “witch-bird” must have been terrifying in earlier times when spirits, myths and mystery had a more central place in everyday social life. Children were told that if they killed this bird or stole its eggs, their homes would go up in flames. (Where there are frogs, one will usually find snakes.



Both animals are feared by many people today, not least the children who were told the Nguni myths of witches and lightening to fill their hearts with terror. Today, scientific tests suggest that many frog species need “sweet water” if they are to live and reproduce successfully. There must be some doubt about the Nguni suggestion that frogs are an indication of water that is not fit for human consumption).

It is also said that it was not advisable to collect water from a river after heavy rain at the start of the annual rainy season. Indigenous commonsense told people to put out pots to collect rain-water. River water would again be collected four days after the rains stopped and the water had cleared. (Heavy

rains wash human and animal wastes into rivers. There is thus a rapid increase in faecal bacteria and disease. In KwaZulu-Natal, health workers have to warn rural people not to collect river water after heavy rains as few remember the earlier Nguni practice of collecting rain-water only four days after the rains have stopped).

Today human and livestock numbers have increased vastly, catchments have become degraded and rivers are often polluted dumping places. The best indigenous practices for the collection of “sweetwater” may not prevent people getting serious diseases from river water. Learning about historical water collection and storage practices can, however, develop a respect for early people and might also help our understanding of water quality issues.

Read the story of ‘Sweet Water and Early Nguni People’ to the class or make photocopies and allow the learners to read it on their own.

As a class, discuss the following questions:

1. How many of you have collected water from a nearby river? What was the water used for? (If for drinking, how were you certain that it was safe to drink?)
2. How many of you have heard the story that has just been read? Who told you this story?
3. Do any of you have stories of other ways of collecting water long ago?
4. Many stories from long ago, are passed down orally from one generation to another. One does not find them written down in books and one has to ask the older people in a community who may remember how things were done long ago. How reliable is this information? What is the danger of not writing down stories from different cultures?
5. Why do you think it is important to look after our rivers and streams?
6. Does the class think that rivers and streams throughout South Africa have changed over the last 100 years? In what way? Why? Have any of you seen changes taking place in a river in your life-time? (*Keen young fishermen in the class may have noticed a decrease or increase in fish species and a change in the water quality or path of the stream/river).*
7. How can we find out what the rivers, streams and other water sources were like in our own community 50 years ago so that we can compare them with what we see today?

Criteria to assess learners during this social sciences: history lesson

Criteria	Exceeded requirements of the Learning Outcome	Satisfied requirements of the Learning Outcome	Partially satisfied requirements of the Learning Outcome	Not satisfied requirements of the Learning Outcome
The learner was able to discuss how reliable and useful stories told by older members in the community were (question 4)				
The learner was able to give reasons why we should conserve and look after our rivers and streams (question 5)				
The learner was able to discuss possible or real changes that have taken place in rivers or streams (question 6)				

ACTIVITY TWO: LOCAL INTERVIEWS, INDIGENOUS STORIES AND CATCHMENT HISTORY

In this ARTS AND CULTURE activity, learners conduct interviews in their local community and then share their findings to the rest of the class in small group role-plays.

A watershed and its catchment is the land from which rainwater flows into wetlands, streams or rivers.

Many of the river catchments of southern Africa have been changed by historical land use practices, settlements and industrial growth to cater for a rapidly expanding population. In many cases, wetlands have been destroyed and riverine vegetation removed, decreasing natural flood control so that the amount and quality of water released by our river catchments is decreasing.



Interviewing local people and collecting stories can develop a sense of how things have changed. Local information and stories are essential for our understanding of local water quality issues.

ACTIVITY

- In small groups of 4 or 5, the learners must work out a set of questions to ask local people, particularly older folk, who have lived in the area for many years.

Some ideas for questions for older people could be:



1. How long have you lived here?
2. Have you noticed any changes, since you were young?
3. What are these changes?
4. How did you collect water long ago?
5. Have you noticed any change in the water? Quality? Amount of water?
6. Have you noticed any changes in the amount of rain that falls?
7. Do you know any local stories about water? (Or animals linked to water?)

Learners also need to work out another set of questions about the present conditions of their catchment and possible problems. These questions can be asked to their friends, parents and other members of the community.

1. How long have you lived here?
2. Where do you get your water?
3. Have you noticed any problems with the quality of water here, in this community? What are these problems?
4. Are the streams and rivers clean in this area? Can one drink from them?
5. Is the community involved in any river clean-up / alien plant eradication projects that you know of?

NB: Only use the questions above if learners are struggling to work out their own sets of questions

Time needs to be set aside, either during or after school, to conduct these interviews, using the questions prepared during the lesson. These local interviews will give the learners information on water and the water quality situation both in the past and today.

And now ... it's time for some drama in our lives!!

What is role-play?

We use role-play to explore different situations and ideas. This is done by acting out a usually authentic situation, without a script.

Now that the water quality and catchment interviews have been completed, each group will role-play their experiences of:

- Deciding what questions the group was going to ask the interviewees;
- Deciding who they were going to interview;
- The interviews themselves;
- Some of the funny/sad/interesting/unusual things that may have happened during the interviews;
- Their interactions with one another during this activity – any conflicts that arose, any differing of opinions (how they were sorted out, or not!), any laughs and good times.



One of the first tasks of the role-play is for each group to decide who are the different characters involved. It is a good idea to use simple props for each character (such as a hat, wig, jacket or jewellery to help characters get into their 'role').



Role-play is a fun way of exploring environmental issues and concerns. At the end of the role-plays, a list of all the main points that emerged from the interviews can be drawn up and shared with the whole class, thus giving a broader and fuller overview of the water and water quality situation in your local catchment.

Criteria to assess learners during this arts and culture lesson

Criteria	Exceeded requirements of the Learning Outcome	Satisfied requirements of the Learning Outcome	Partially satisfied requirements of the Learning Outcome	Not satisfied requirements of the Learning Outcome
The learner was able to research the issue of water quality by conducting interviews within their local community				
The learner was able to work in a group and play a part in the role-play of water and water quality				

ACTIVITY THREE: AUDITING OUR WATER CONSUMPTION

Auditing our individual family's water consumption is a good start to investigating how we can all reduce water waste and together, as a community, develop a water-wise management plan. This **NATURAL SCIENCES** activity allows learners to prepare for a water audit, collect data in and around their home, school and community and then develop a school water-wise management plan.



To prepare for an audit of the school, home or community water-supplies, current patterns of use must be calculated and averaged.

This makes an audit a simple matter of recording the number of times each activity happens. Preparation activities also point to wasteful practises that can be changed.

For example: People with piped water often clean their teeth or take a drink with the tap running. In this way, fresh water is wasted when it would have been more sensible to use a cup.



Let the learners try this activity:

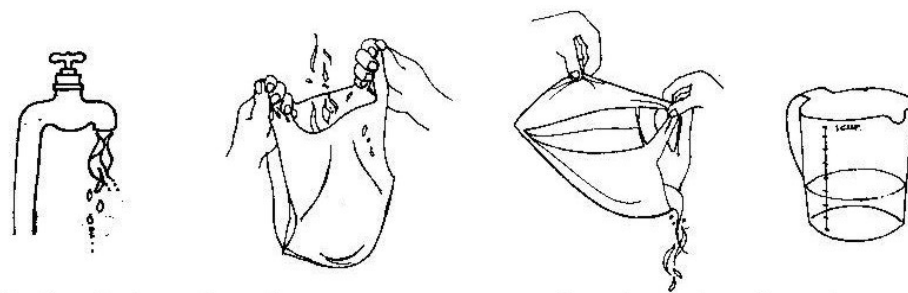
Calculate the water used when brushing teeth or taking a drink from a running tap. Use a plastic bag to collect the wasted water and measure the amount wasted using the measuring equipment (*see box on the next page*)

Calculate the difference:

Water used with the tap left running/
Water used with a cup

Difference/
(not wasted when cup used)

BAG MEASURE



For fast leaks and running taps, use a supermarket plastic bag. Pour the water collected into a container and use a measuring jug to measure. A cheaper alternative is to make your own measuring equipment.

Making your own measures

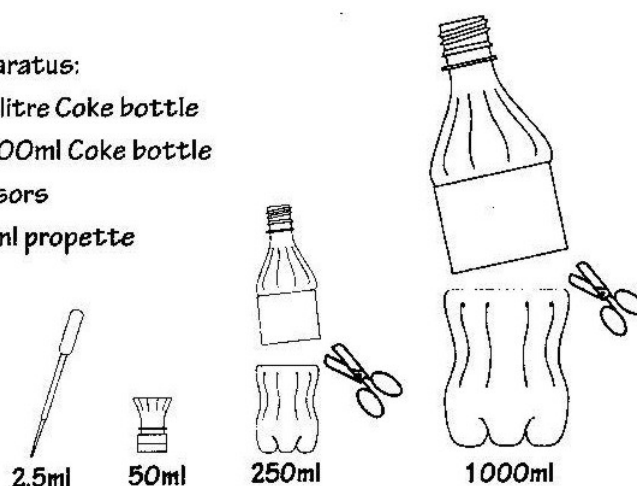
Apparatus:

1 x 2 litre Coke bottle

1 x 500ml Coke bottle

scissors

2,5 ml propette



- Cut the bottles as shown in the picture. This will give you 50ml; 200ml; 1 000ml; measuring apparatus.
- Accurate apparatus is important so check by filling the larger from the smaller:
 - * The 2.5ml is pre-calibrated
 - * 50ml is 20 x 2.5ml
 - * 250ml is 5 x 50ml
 - * 1 000ml is 4 x 250ml

Although not as accurate as a measuring jug, this equipment is more than adequate for auditing water use.

To measure a bag of water, simply fill the 1 000ml, counting each time until a part-filled container remains. Pour this into the 250ml until a part-filled container remains and do the same right down to a part-filled 50ml measure which is determined by the propette. Written like this, it seems a little complex but with practise a bailing and counting method is both quick and accurate.

Make a list of common water use activities in preparation for doing an audit of water use.



Flushing toilet

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Urinal

.....l



Washing hands

.....l



brushing teeth

.....l



Drinking

.....l



Bathing

.....l



Taking a shower

.....l



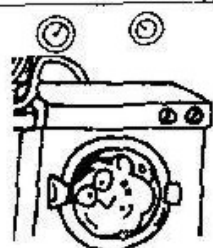
Kettle

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Hand washing clothes

.....l



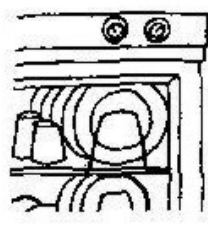
Washing machine

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Washing dishes

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Dishwasher

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Garden hose (litres per minute)

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Cooking pots

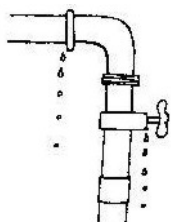
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REMIND THE LEARNERS THAT ...

Despite sound preparation and knowing how much water is used for each activity, a water audit is never an easy matter. You will only be successful if, from the beginning, you keep it simple and have ways of checking your work for accuracy.

For example:

If a check of results against the meter reading shows that more water is used than the audit records then:



1. There may be a leak in the pipes (check this by switching all the taps off and seeing if the meter keeps ticking)
2. You may have missed measuring an important water activity, or
3. Your calculations may be wrong!

In this way, an audit of water use will always present challenges and problems to be solved. Here are some ideas to help the learners plan an audit of the school, home and community water use.

Day 2-	124930 ℓ
Day 1-	112910 ℓ
	<hr/>
	12020 ℓ used
	(12 kilolitres)

SCHOOL: Start with each person in the class doing an audit of the water they use in a day. This can then be combined into an audit of the water used by the whole class. During National Water Week, try an audit of water use in the school and check the accuracy of your records using the water meter if there is one.



HOME: Get the learners to plan an audit with their family, using simple record sheets at each site of water use. Totals for the day should be matched with the meter reading or monthly water bill.

COMMUNITY: Patterns of use at home and at school can give the learners an idea of domestic water use in the community. Offices, industries and agriculture often use vast amounts of water when compared with domestic consumption. There are also many people in our communities who do not use piped water.



Remember that we need clean water for our health. Water conservation is not about people drinking or using less water but a challenge of working out ways to reduce unnecessary waste so there is more clean water to go around.