

ACTIVITY FOUR: HOW DO WE MAKE WATER SAFE TO DRINK?

This TECHNOLOGY lesson encourages learners to think about the health of water and how to make water safe to drink. It also looks at how indigenous people collected water in the past.

If possible, organise a trip to your local water sanitation plant. You will need to find out if your local water board offers guided tours of their water processing plant. If they do, ask them to focus on sanitation and how and why water is cleaned before it reaches our taps. This will help learners understand how and why water is treated before we can use it in our homes and at school. If you are unable to visit the water works, share the comic story of 'How is Tap Water Cleaned' (on page 14) with your class.



READ THE FOLLOWING TO YOUR CLASS:

Did you know?

About 6 000 children die every day because of dirty, unhealthy water. Water that goes through a chemical and filtration process to remove the germs and dirt is the best way to treat water. In cities, water boards look after the treatment of water for people. However, in many parts of the country, away from cities, people have to collect their own water from nearby rivers and streams. Sometimes these streams and rivers are clean and unpolluted but sometimes they are dirty with lots of rubbish and disease in them.

As a class, discuss and brainstorm where and how you should collect water for your family, if you lived in a rural area with no access to piped treated water. Write down all the learners' ideas on the chalkboard.

Some ideas to get the discussions going

We would collect water that

1. is unpolluted by livestock (cattle, goats, sheep)
2. is unpolluted by human waste (faeces, washing of clothes or people)
3. is not close to pit toilets
4. has no dead fish or other dead animals in it
5. has no litter and rubbish
6. is not close to factories that might pump waste into the river / water source
7. is not close to where you can see pipes going into the river or stream
8. is from fast flowing water sources
9. is not known to have caused any ill health in the past (community knowledge)

Once the water has been collected, how would you store it?

- Collect and store the water in clean, hygienic containers at all times.;
- Keep water containers for collecting and using water only not for other liquids such as paraffin or petrol;
- Keep water that is collected for home use in a cool, dry place.

READ THE FOLLOWING TO YOUR CLASS:

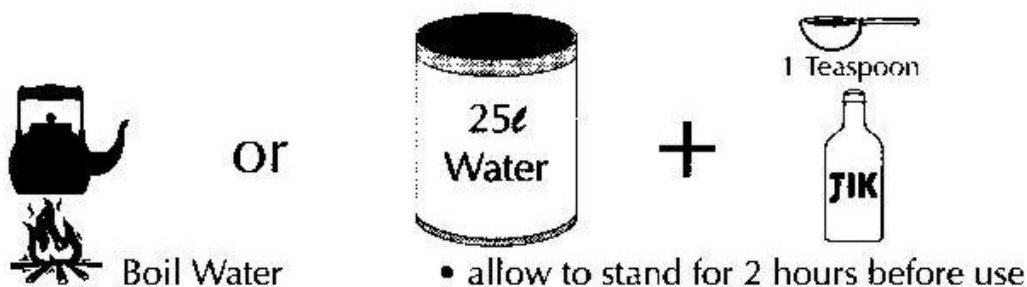
Long ago, the Nguni people collected water where they could hear it running over stones or dripping down rocks. If a spring was for human use, it was protected by a circle of rocks with a small outlet. Cattle drank elsewhere.

A water source would always be approached with care so as not to frighten crabs and other small water animals. If these small animals were disturbed, their movement would stir up sand and the person collecting the water would have to wait for the river sand to settle. The surface of the water was 'swept' with the hand and water was collected well below the surface. *(Did you know that there are higher numbers of bacteria living on the surface water of streams and ponds than there are just below the surface).*



ASK THE CHILDREN:

- Have you heard or do you know of any other ways that people collected water long ago?
- Do any of you know of any simple way that you can clean (purify) your drinking water (especially if you are collecting it from a river or spring and are not sure that it is clean). *(Demonstrate to the learners the two simple ways of purifying water that follow below).*
 - A simple way of purifying water is to add a teaspoon of jik to every 25 litres of water. Jik is very strong and kills all the bacteria, making the water safe to drink.
 - You can also boil the water, and that will kill any germs or bacteria that may be living in it. The water can then be left to cool. It does not need to be drunk hot.



ASK THE CHILDREN:

1. To describe what you, the teacher, did during the two demonstrations.
2. Why is the water safe to drink if it is boiled or has jik in it?
3. Do they know of any other ways of purifying water?
4. Do they think a purification water works would make life easier for people? Why?

Criteria to assess learners during this technology 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 gave an opinion (yes/no) on whether a water purification works would make life easier for people				
The learner could give a valid reason as to why life was (or was not) easier for people who had to collect and purify their own water				

HOW IS TAP WATER CLEANED?

1

I have travelled along many rivers to get to the Vaal Dam.

Along the way I have picked up many 'passengers' that make me dirty. I am now in a canal travelling to a water purification station to be cleaned.

"PASSENGERS":

- large living organisms (fish, crabs, floating plants)
- sticks, leaves & litter
- sand, soil & clay particles
- small living organisms (insects, algae, plankton)
- germs (viruses & bacteria)
- 'bad guys' (pesticides, fuel, mercury, arsenic etc.)

2

When I arrive at the station I pass through screens that trap large living organisms, sticks, leaves & litter.

3

I flow into a spiral tank where chemicals are added. I move at high speed, which mixes the chemicals in the water. All the sand, soil and clay particles, as well as some small living organisms, germs, and all the 'bad guys' stick to the chemicals to form 'clumps'.

As I begin to slow down these 'clumps' join together to form 'floc'.

4

I then flow into a large tank where I slow down even more to allow the 'floc' to settle to the bottom. This forms 'sludge'. This 'sludge' will later be sucked out of the tank. I feel much cleaner and lighter, but I'm feeling a bit weak!

5

Ooh this is ticklish! I have flowed over a weir and into another tank where carbon dioxide is bubbled into me. I am feeling much better!

6

Almost clean! As I pass through a sand filter the last stubborn small living organisms and some germs are removed. Hey this doesn't hurt at all!

7

Wow, this feels good! I'm now being mixed with chlorine gas, which kills all the remaining germs. I am sparkling clean. Clean enough to drink!

8

I have now been pumped to a reservoir. What a cool place! So many friends! From here I get piped to houses, schools, businesses and factories. I'm really proud to be tap water. Please remember to use me wisely!

Water Wise

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For more information about the Water Wise Education Programme, please contact Rand Water on (011) 682-0773 or www.randwater.co.za

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