

WATER CRISIS 1



In 2018 Cape Town was in danger of running out of water. Half a billion people in the world face severe water scarcity all year round. Half of the world's largest cities experience water scarcity

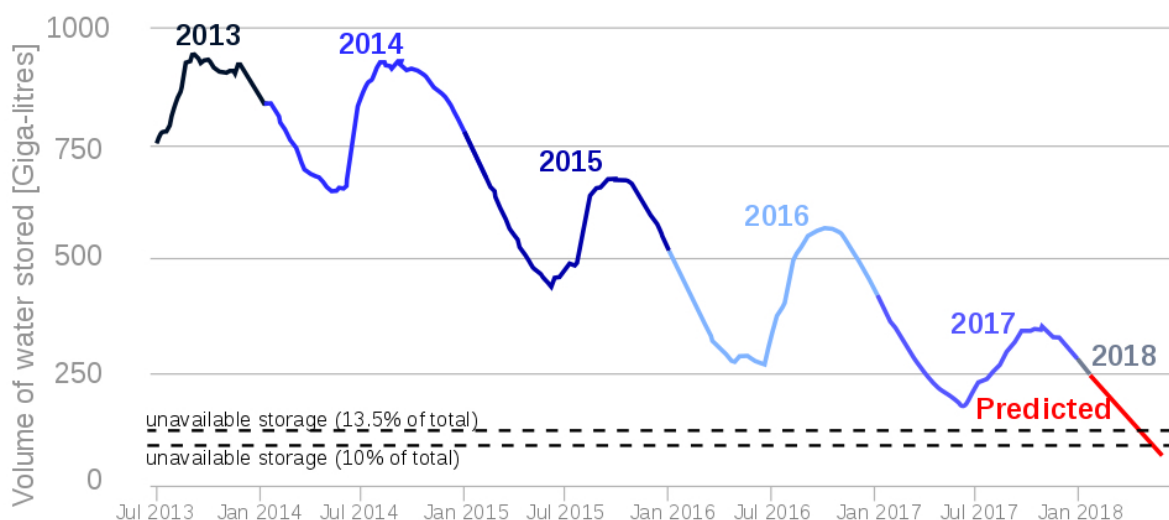
In 2018 the City of Cape Town rationed everyone to 87 litres a day and published this poster. A few weeks later they reduced the ration to 50 litres per person per day.

Explain what the pictograph shows.

Draw a bar graph from this data.

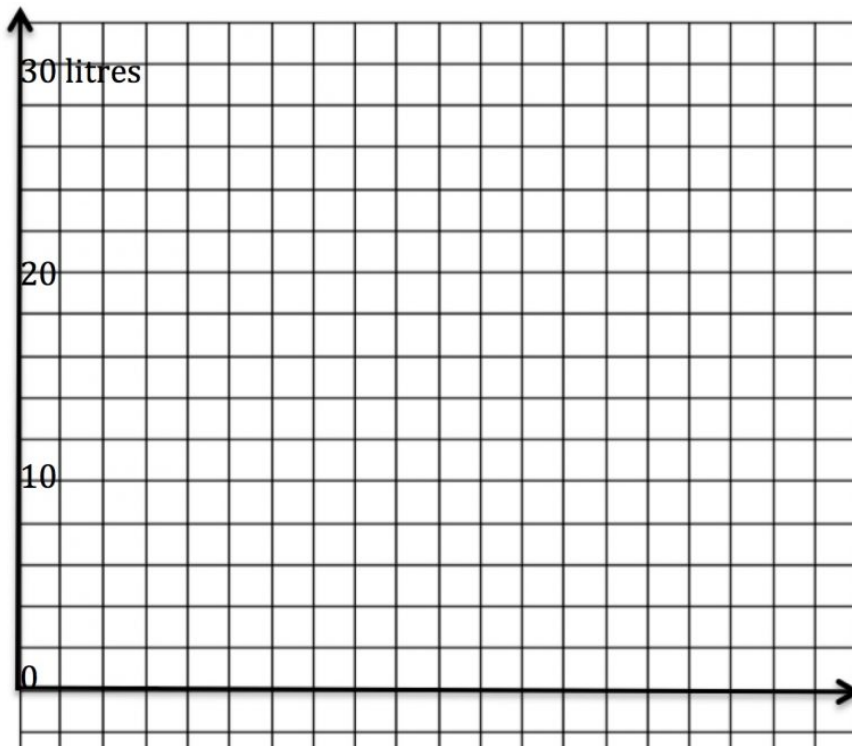
If you lived in Cape Town, where do you think you could save 37 litres from the 87 litre allocation?

The graph below shows the total water stored in the Western Cape's largest six dams from 30 June 2013 to 15 January 2018. Why do you think that the graph has this shape with peaks and troughs?



Data obtained from the University of Cape Town [Climate Systems Analysis Group](#)

HELP



Count the number of bottles of water of each colour.

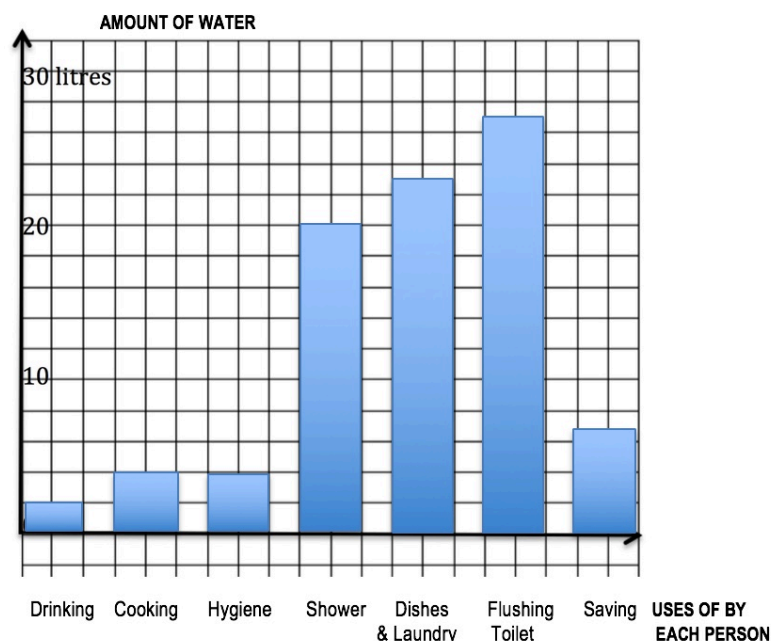
Draw a bar chart on this grid with 7 columns one for each type of water consumption.

NEXT

In the graph showing the amount of water in the Western Cape's reservoirs over 5 years what do you notice about the heights of the 'peaks' in the graph. What does this tell you about the rainfall?

NOTES FOR TEACHERS

SOLUTION



The peaks and troughs in the graph of the water stored in the dams occur because of the seasons. The peaks show the rainy season when the dams fill up and the troughs show the dry season when there is very little water but the water is used so the level in the dams goes down.

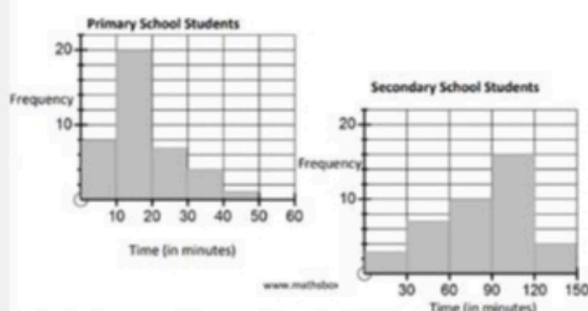
Note that about 150 Giga-litres in the dams is not suitable for the city water supply.

Diagnostic Assessment This should take about 5–10 minutes.

- Write the question on the board, say to the class:
“Put up 1 finger if you think the answer is A, 2 fingers for B, 3 fingers for C and 4 fingers for D”.
- Notice how the learners responded. Ask a learner who gave answer A to explain why he or she gave that answer and DO NOT say whether it is right or wrong but simply thank the learner for giving the answer.
- Then do the same for answers B, C and D. Try to make sure that learners listen to these reasons and try to decide if their own answer was right or wrong.

How many primary school students spent 20 minutes or less on their homework?

Time spent on homework at the weekend



- 20
- 7
- 28
- 10

4. Ask the class again to vote for the right answer by putting up 1, 2, 3 or 4 fingers. Notice if there is a change and who gave right and wrong answers. It is important for learners to explain the reason for their answer otherwise many learners will just make a guess.

5. If the concept is needed for the lesson to follow, explain the right answer or give a remedial task.

C. is the correct answer.

Common Misconceptions

A. Learners giving this answer have maybe only looked at one of the bars not the total of the frequencies.

B. or D. Could have been a guess.

<https://diagnosticquestions.com>

Why do this activity?

This activity relates to a real situation and it prompts discussion about how we use water. It connects school maths to the real world and asks learners to interpret a simple pictogram so the activity is suitable for very young learners. Even if learners have not met pictograms before the activity of looking at the poster and talking about it with a partner or in a group can start **the inquiry based lesson** and come before the teacher talks to the class and encourages learners to discuss the data and to answer questions. The activity could prompt learners everywhere to think about how dependent we all are on our water supply although showers and flush toilets are outside the experience of many. It helps learners to understand why everyone in Cape Town, and in other drought areas, should be careful not to waste water. Learners can be encouraged to look at graphs that they see on posters, on TV and in newspapers and to bring them into lessons.

Learning objectives

In doing this activity students will have an opportunity to:

- draw a simple bar graph;
- analyse data by answering questions related to data categories;
- summarise data verbally and in short written paragraphs.

Generic competences (some suggestions, select from list or write your own)

In doing this activity students will have an opportunity to:

- evaluate and interpret information from charts;
- discuss the need for people to show social responsibility and act in the good of the community.

Suggestions for teaching

Start with the Diagnostic Quiz to review bar charts.

Take a bottle or jug that holds 1 litre into the lesson to show learners how much water this is and also a mug.

If possible obtain a poster or make a large copy of the poster shown on page 1 and show it to the class.

Ask learners to say what the pictograph shows. Ask questions about why they think there is a problem. Show learners the graph of the water stored in the dams that supply water to Cape Town and ask them to explain why the graph has the shape with peaks and troughs. If learners do not say anything about rainfall and drought and climate change introduce these concepts.

Then give the learners a copy of the grid on page 1 (or draw it on the board and ask learners to copy it onto squared paper). Ask learners to draw a bar graph from the data shown in the pictograph.



Ask the learners to look at this picture. Ask “Why do you think the people in this household stand in the baby bath to have a shower? What do you think they use the shower water for?” Have a discussion about ways of conserving water.

Key questions

- Have you labelled the axes on your graph?
- Look at the 10, 20 and 30 litres marks on the vertical scale, how many litres does each square on the grid show?

- Why do you think it is a good idea to have a space between each bar?
- Do you think everyone in the city has taps, running water and flush toilets in their homes?
- Can you think of ways your household could save water?
- How many mugs of tea or coffee can you make with 2 litres?

Follow up

See the activity Drinking Water <https://aiminghigh.aimssec.ac.za/grades-6-to-10-drinking-water/>

Note: The Grades or School Years specified on the AIMING HIGH Website correspond to Grades 4 to 12 in South Africa and the USA, to Years 4 to 12 in the UK and up to Secondary 5 in East Africa. New material will be added for Secondary 6. The mathematics taught in Year 13 (UK) and Secondary 6 (East Africa) is beyond the school curriculum for Grade 12 SA.

For resources for teaching A level mathematics see <https://nrich.maths.org/12339>

	Lower Primary or Foundation Phase Age 5 to 9	Upper Primary Age 9 to 11	Lower Secondary Age 11 to 14	Upper Secondary Age 15+
South Africa	Grades R and 1 to 3	Grades 4 to 6	Grades 7 to 9	Grades 10 to 12
USA	Kindergarten and G1 to 3	Grades 4 to 6	Grades 7 to 9	Grades 10 to 12
UK	Reception and Years 1 to 3	Years 4 to 6	Years 7 to 9	Years 10 to 13
East Africa	Nursery and Primary 1 to 3	Primary 4 to 6	Secondary 1 to 3	Secondary 4 to 6