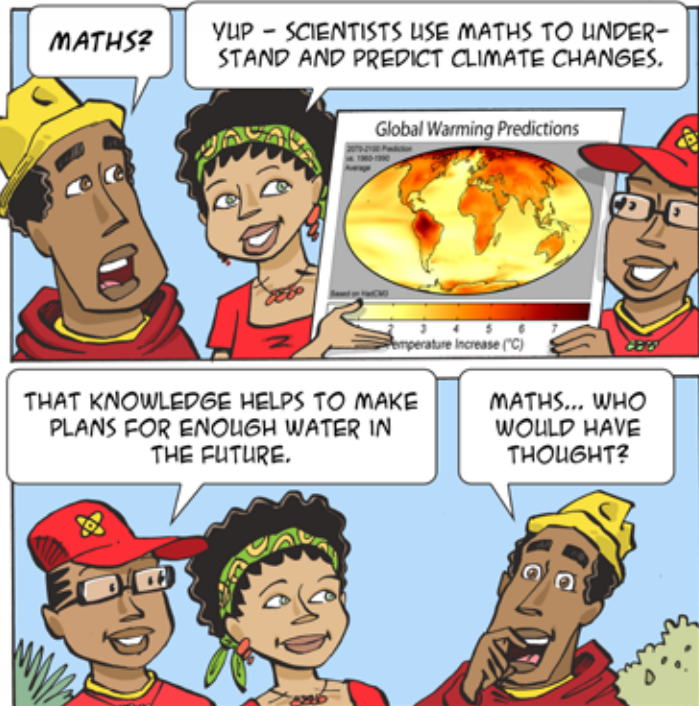
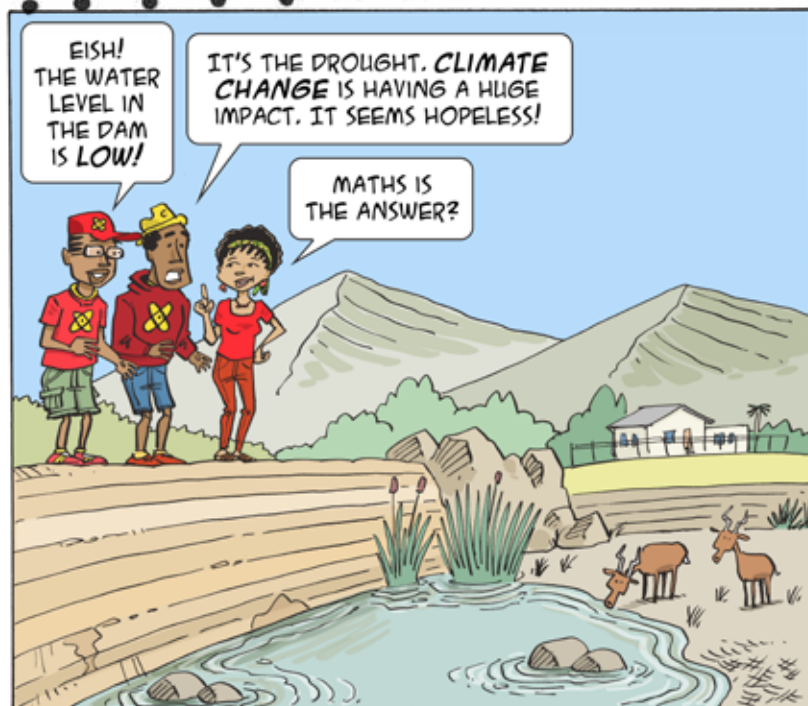
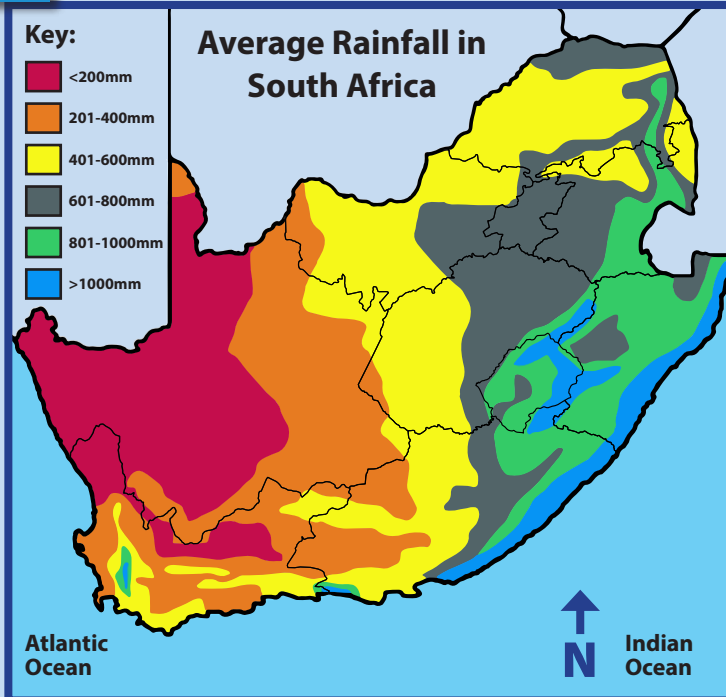


MATHEMATICS AND WATER



CLIMATE MODELS

MATHS CAN BE USED IN CLIMATE MODELS TO PREDICT HOW OUR CLIMATE AND WEATHER ARE CHANGING. FACTORS SUCH AS THE OCEANS, LAND AND ATMOSPHERE ALL PLAY A PART IN WHAT OUR CLIMATES LOOK LIKE NOW, AND WHAT THEY WILL LOOK LIKE IN THE FUTURE.



Source: www.mycyberwall.co.za



Scientists in South Africa are researching Climate Models to help us manage resources such as water.



MATHS CAN SAVE WATER

1

FIND 3 DIFFERENT CONTAINERS WITH DIFFERENT SIZE OPENINGS.



2

WORK OUT THE SURFACE AREA OF THE OPENING. HERE ARE THE FORMULAS TO USE:

- ROUND OPENING:
 πR^2 (R IS THE RADIUS)
- SQUARE OR RECTANGLE OPENING:
LENGTH X BREADTH (L X B)



3

COMPARE THE OPENINGS TO SEE WHICH IS THE BIGGEST AND WHICH IS THE SMALLEST.



4

THE SMALLER THE OPENING, THE SLOWER THE EVAPORATION OF WATER FROM THAT CONTAINER SHOULD BE. PREDICT WHICH CONTAINER WILL HAVE THE MOST AND THE LEAST EVAPORATION.



5

PUT THE SAME AMOUNT OF WATER INTO EACH CONTAINER. PLACE THEM OUTSIDE IN A SUNNY SPOT.



6

AFTER A COUPLE OF HOURS, COMPARE THE AMOUNTS OF WATER LEFT IN EACH CONTAINER. WAS YOUR PREDICTION CORRECT?



WHAT'S HAPPENING HERE?



Midmar Dam

Capacity (amount of water it can hold): 235 000 megalitres

Surface area: 1788 hectares **Depth:** 30 m

Two large dams on the Umgeni River in KwaZulu-Natal are *Midmar Dam* and *Inanda Dam*. Here are some stats for the dams:



Inanda Dam

Capacity (amount of water it can hold): 241 700 megalitres

Surface area: 1463 hectares **Depth:** 65 m

The people looking after the water often let water out of Midmar Dam to fill up Inanda Dam first. From what you know about surface area and evaporation from the activity, you should understand why they do this. They use their knowledge about *surface area* and *holding capacity* of the dams to ensure they keep as much of the water as they can.

MATHS CAN SAVE WATER!



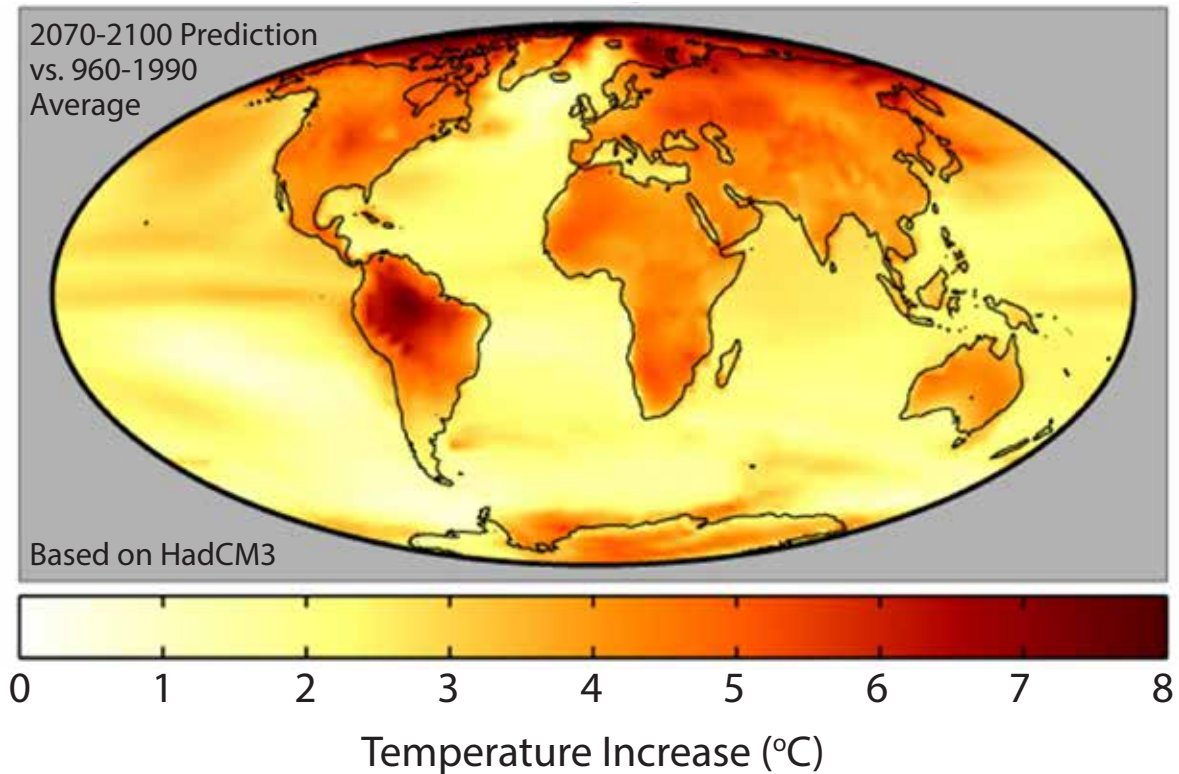
SA REFERENCE

The *Global Change Institute* at Wits University works to predict problems, for example lack of water, droughts and floods.

They do *scientific research* that gives them the knowledge that can be used to solve these problems. Part of what they do is called *Climate Modelling*, using maths.



Global Warming Predictions



CAREERS:

Meteorologists are scientists who study the atmosphere of the earth and what happens there. Weather and climate is part of that. So predicting climate changes is part of what they do.



Ruwadzano Matsika holds a doctorate in Resource Ecology. She is researching the best ways to help society to plan and protect themselves better against the impacts of climate change. She meets with people in business and municipalities to discuss how to make climate smart decisions for the benefit of all. She enjoys the challenge of dealing with complex, real-world problems that require new and innovative approaches to research and thinking about climate change.

Climate Change Analysts collect and analyse data about the changing climate. They also get involved in politics where they create laws about climate change.

CURRICULUM LINKS

- **Grade 7, 8, 9: Mathematics** – Whole Numbers, Exponents, Decimal Fractions, Algebraic Expressions, Algebraic Equations, Geometry of 2D Shapes, Area and Perimeter of 2D Shapes
- **GRADE 7: Social Sciences Geography** – Natural Resources and Conservation in South Africa
- **GRADE 8: Natural Sciences** – Planet Earth and Beyond
- **GRADE 8: Social Sciences Geography** – Resource use and Sustainability



PUZZLE YOUR MIND!!!

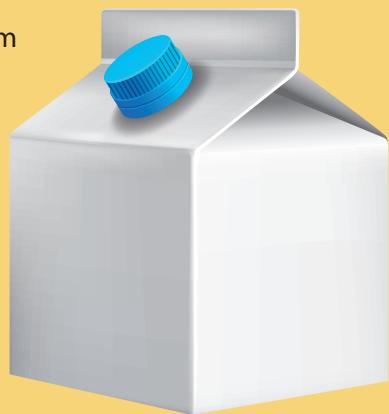
YOU ARE GOING CAMPING AND NEED TO CARRY WATER WITH YOU. YOU HAVE THREE CONTAINERS TO CHOOSE FROM BUT YOU ONLY HAVE SPACE TO TAKE ONE OF THEM WITH YOU. USE THE FORMULAS TO WORK OUT WHICH ONE WILL BE ABLE TO HOLD THE MOST WATER.

A cube-shaped container

Each side is 9 cm in length

Formula:

L^3 or $L \times L \times L$



A tall, rectangular container

Height: 20 cm, Length: 7 cm,

Width: 5 cm

Formula: $L \times B \times W$



A cylindrical container

Height: 22 cm, Diameter: 6 cm,

Formula: $\pi R^2 \times H$

Answer: The cube-shaped container

START YOUR OWN SCIENCE SPAZA

Do you want to start a science club at your school? Send us the following information, and Science Spaza will contact you.

School: _____

Name: _____

Telephone number: _____

Email address: _____

Postal address: _____

Visit www.sciencespaza.org, email info@sciencespaza.org, sms or WhatsApp us on 076 173 7130 or write to us at PO Box 22106, Mayor's Walk, 3208.

WE WANT YOUR FEEDBACK!

TELL US IF YOU MANAGED TO WORK OUT WHICH WAS THE BEST CONTAINER TO TAKE CAMPING WITH YOU.



The Department of Science and Technology contributes to increased well-being and prosperity through science, technology and innovation. For more information visit: www.dst.gov.za.



The CoE for Mathematical and Statistical Sciences, hosted at Wits University, focuses on themes that reflect the pure and applied nature of the mathematical sciences. CoE-MaSS encourages cross-disciplinary research and develops national capacity in mathematics and statistics.



Science Spaza is managed under the auspices of the YAZI Centre for Science and Society in Africa (NPC-K2015047709, Non-Profit Organisation 151-830 NPO). www.yazi.org.za

