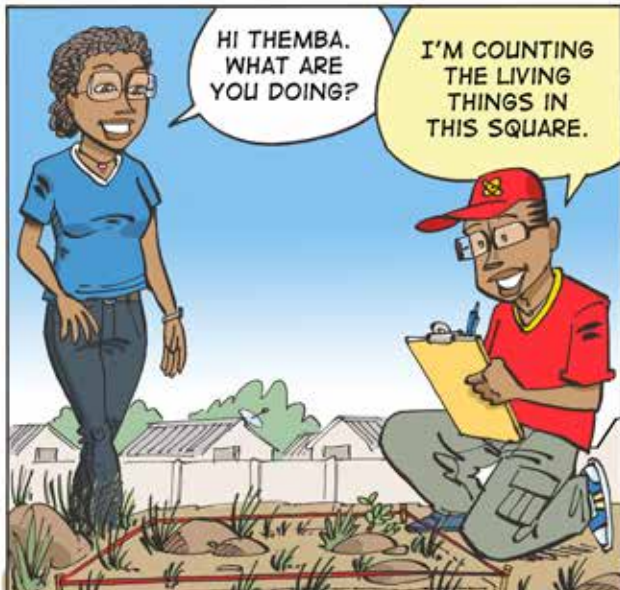




PROTECT OUR ENVIRONMENT



ACTIVITY: MEASURE HUMAN IMPACT

YOU WILL NEED:



A METRE-RULE OR TAPE MEASURE



SOME STICKS AND STRING



PAPER AND PEN/CLIPBOARD

1 WHAT TO DO:



2



3 USE A METRE RULE OR A TAPE MEASURE TO MEASURE OUT A SQUARE 1M X 1M IN AREA A. USE STICKS AND STRING TO MARK OUT THE AREA. DO THE SAME FOR AREA B.

4 MAKE A LIST OF ALL THE DIFFERENT TYPES OF PLANT AND ANIMAL SPECIES THAT YOU CAN FIND IN EACH AREA.



5 WHAT DO YOU NOTICE ABOUT THE NUMBER OF PLANT AND ANIMAL SPECIES IN **AREA A** COMPARED TO THOSE IN **AREA B**?

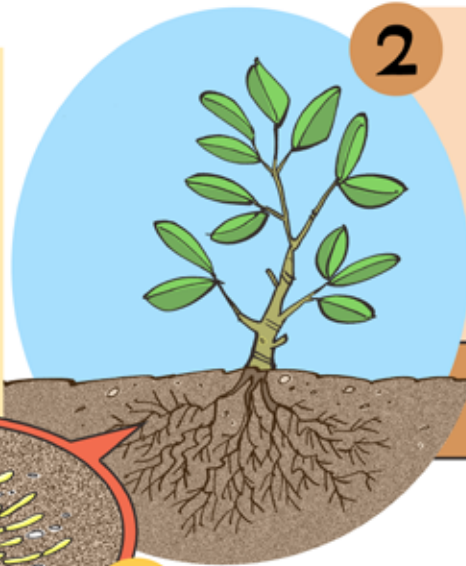
6 WHAT CAN YOU SAY ABOUT THE **IMPACT** OF HUMAN ACTIVITY ON THE BIODIVERSITY OF THESE AREAS?

WHAT'S HAPPENING HERE?

YOU PROBABLY NOTICED THAT THERE ARE MORE KINDS OF PLANTS AND ANIMALS IN THE NATURAL AREA THAN IN THE AREA AFFECTED BY HUMAN ACTIVITY.

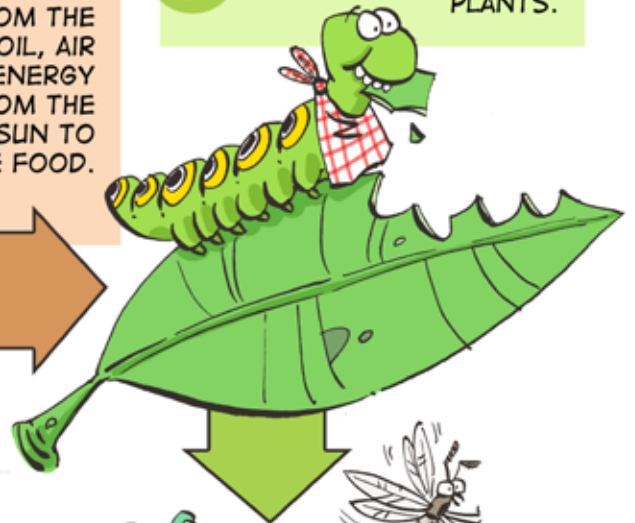
IN A HEALTHY ENVIRONMENT, MANY DIFFERENT PLANTS AND ANIMALS LIVE TOGETHER AND DEPEND ON EACH OTHER. HERE IS A SIMPLE **FOOD CHAIN**.

1 **MICROBES**
MILLIONS OF TINY MICROBES IN THE SOIL LIVE OFF WASTE MATERIAL AND THINGS THAT HAVE DIED. THEY PRODUCE SUBSTANCES THAT PLANTS NEED TO GROW.



2 **PLANTS**
PLANTS USE SUBSTANCES FROM THE SOIL, AIR AND ENERGY FROM THE SUN TO MAKE FOOD.

3 **PLANTEATERS**
THE CATERPILLAR EATS PLANTS.



4 **PREDATORS**
THE FROG EATS INSECTS



5 WHEN THE FROG DIES HE BECOMES FOOD FOR MICROBES



WHAT HAPPENS TO PLANTS IF THERE ARE NO MICROBES IN THE SOIL?

WHAT HAPPENS TO THE CATERPILLAR IF THERE ARE NO PLANTS?

WHAT HAPPENS TO THE FROG IF THERE ARE NO INSECTS?

WHAT HAPPENS TO ANIMALS THAT EAT FROGS?

IN NATURE THERE ARE MANY FOOD CHAINS LINKED TOGETHER TO MAKE A **NETWORK**. ALL THE LIVING THINGS DEPEND ON EACH OTHER, SO THE NETWORK CONTINUES YEAR AFTER YEAR. WE SAY IT IS **SUSTAINABLE**.

WHEN ANIMALS OR PLANTS ARE REMOVED FROM AN AREA, OTHER SPECIES THAT DEPEND ON THEM DIE. THIS **REDUCES THE BIODIVERSITY** OF THE ENVIRONMENT.

BIO- = LIFE
DIVERSE = DIFFERENT
BIODIVERSITY = NUMBER OF DIFFERENT LIVING THINGS THAT LIVE TOGETHER IN A SUSTAINABLE NETWORK

SPACE SCIENCE AND BIODIVERSITY

WHAT HAVE **SPACE** AND **BIODIVERSITY** GOT TO DO WITH ONE ANOTHER?



THE SOUTH AFRICAN NATIONAL SPACE AGENCY IS USING **SATELLITES** IN SPACE TO MONITOR BIODIVERSITY. SATELLITE CAMERAS TAKE PHOTOGRAPHS OF NATURAL AREAS ON THE EARTH. THIS ALLOWS THEM TO NOTICE THREATS TO BIODIVERSITY SO THAT PEOPLE CAN TAKE STEPS TO PRESERVE THE ENVIRONMENT FOR THE FUTURE BY:

- SETTING ASIDE LAND FOR NATURE RESERVES
- CLEARING INVASIVE ALIEN SPECIES
- MAKING LAWS TO PROTECT NATURE



These satellite images show the effect of forestry on natural grassland in the Cathedral Peak area of the Drakensberg. The colours in the right-hand image show differences in vegetation. The yellow area indicates grassland degraded by forestry.

PUZZLE YOUR MIND!!!

USE THESE CLUES TO FIND THE MISSING WORDS. THERE ARE A FEW LETTERS TO HELP YOU. THE ANSWERS ARE ALL IN THIS WORKSHEET.

1. This word describes a plant or animal species that has totally died out.
2. Bad farming can cause soil _____.
3. When the plants and animals in a healthy environment form a network that keeps it going, we say the environment is _____.
4. Humans make these devices that move around the earth in space.
5. The name of a type of invading alien plant.
6. These images are used to monitor the diversity of plants in an area of land.
7. This word indicates the wide variety of different living things on Earth.
8. The different kinds of living things.



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CAREERS:

- ENVIRONMENTAL SCIENTIST
- COMPUTER PROGRAMMER FOR ECOSYSTEM MODELING
- SOIL SCIENTIST



Dr Clement Adjorlolo is a senior remote sensing researcher at the Earth Observation Directorate of the South African National Space Agency (SANSA). Remote (far away) sensing (getting information) allows Clement to use satellite images to help make decisions which affect people's lives.

CURRICULUM LINKS

- GRADE 8: **LIFE & LIVING** (THE ENVIRONMENT)
- GRADE 10: **LIFE SCIENCES** (BIODIVERSITY AND CLASSIFICATION)
- GRADE 11: **LIFE SCIENCES** (HUMAN IMPACT ON ENVIRONMENT)

HOW CAN WE LIVE SUSTAINABLY?



IS IT POSSIBLE FOR PEOPLE TO USE THE ENVIRONMENT IN A **SUSTAINABLE** WAY? HOW CAN WE PREVENT THE LOSS OF BIODIVERSITY?

HUMANS **CHANGE** THE NATURAL ENVIRONMENT BY:

- CLEARING LAND TO MAKE ROADS AND BUILDINGS.
- BRINGING ALIEN PLANTS, LIKE WATTLES AND BUG-WEED, THAT SPREAD AND KILL LOCAL PLANTS.
- POLLUTING WATER AND SOIL, WHICH DESTROYS PLANTS AND ANIMALS.
- FARMING, WHICH REDUCES BIODIVERSITY AND CAN CAUSE SOIL EROSION.
- OVER-USING SOME PLANTS, OR HUNTING TOO MANY ANIMALS, CAUSING SPECIES TO BECOME EXTINCT (DIE OUT).

GIVE US YOUR FEEDBACK

1. WHAT WORD HAVE YOU MADE IN THE **COLUMN WITH BOLD BLOCKS** IN YOUR WORD PUZZLE?
2. WRITE TWO THINGS **YOUR COMMUNITY** CAN DO TO CONSERVE BIODIVERSITY.

Send your answers and the name of your club to our Whatsapp or SMS number **076 173 7130**; email us at **info@sciencespaza.org**; Facebook us at **f ScienceSpaza** or contact us through our website **www.sciencespaza.org**

START YOUR OWN SCIENCE SPAZA

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



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SOUTH AFRICAN NATIONAL
SPACE AGENCY

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 South African National Space Agency (SANSA) works to ensure that space science and technology benefits society, the environment, the economy and the global community. SANSA is mapping vegetation across South Africa using satellite images. The information will be used by the Department of Agriculture, Forestry and Fisheries for rangeland assessment, by the Department of Water Affairs and Sanitation and by the Department of Environmental Affairs.

