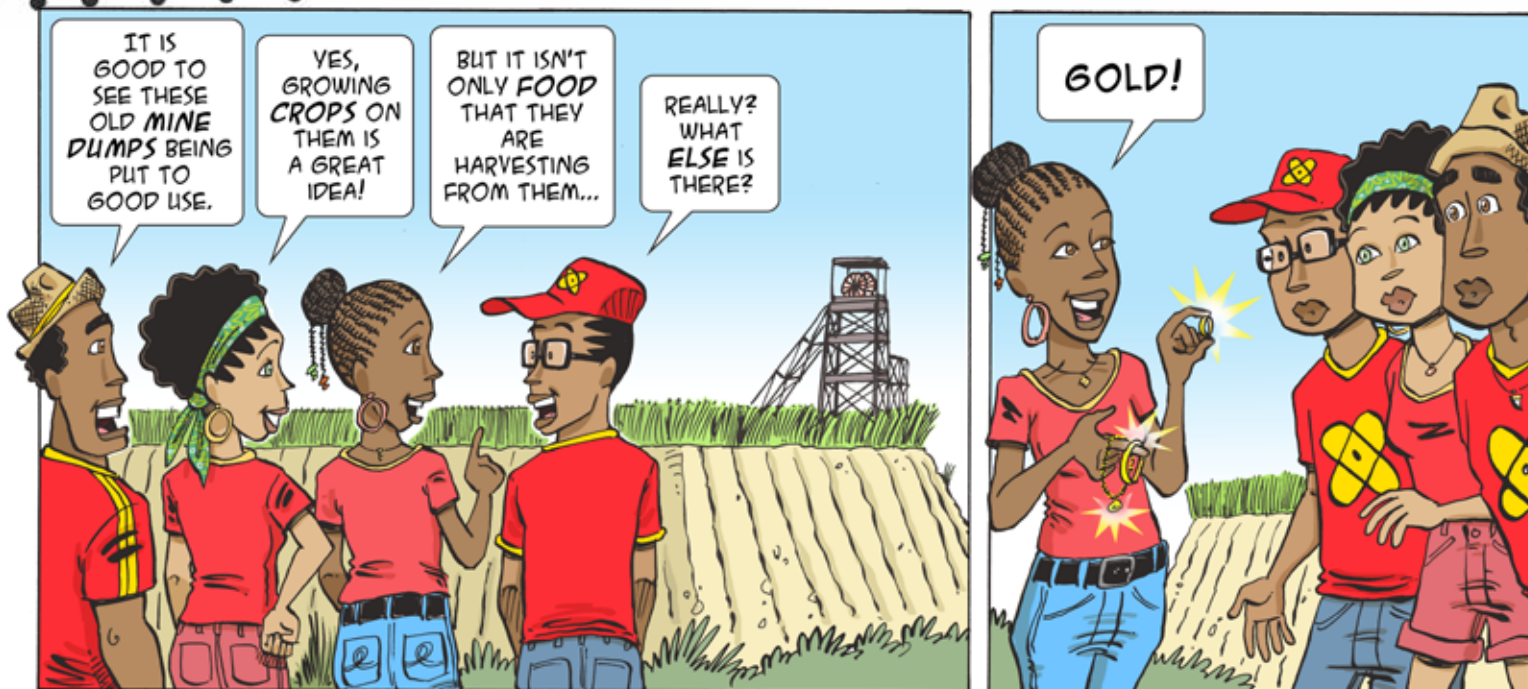




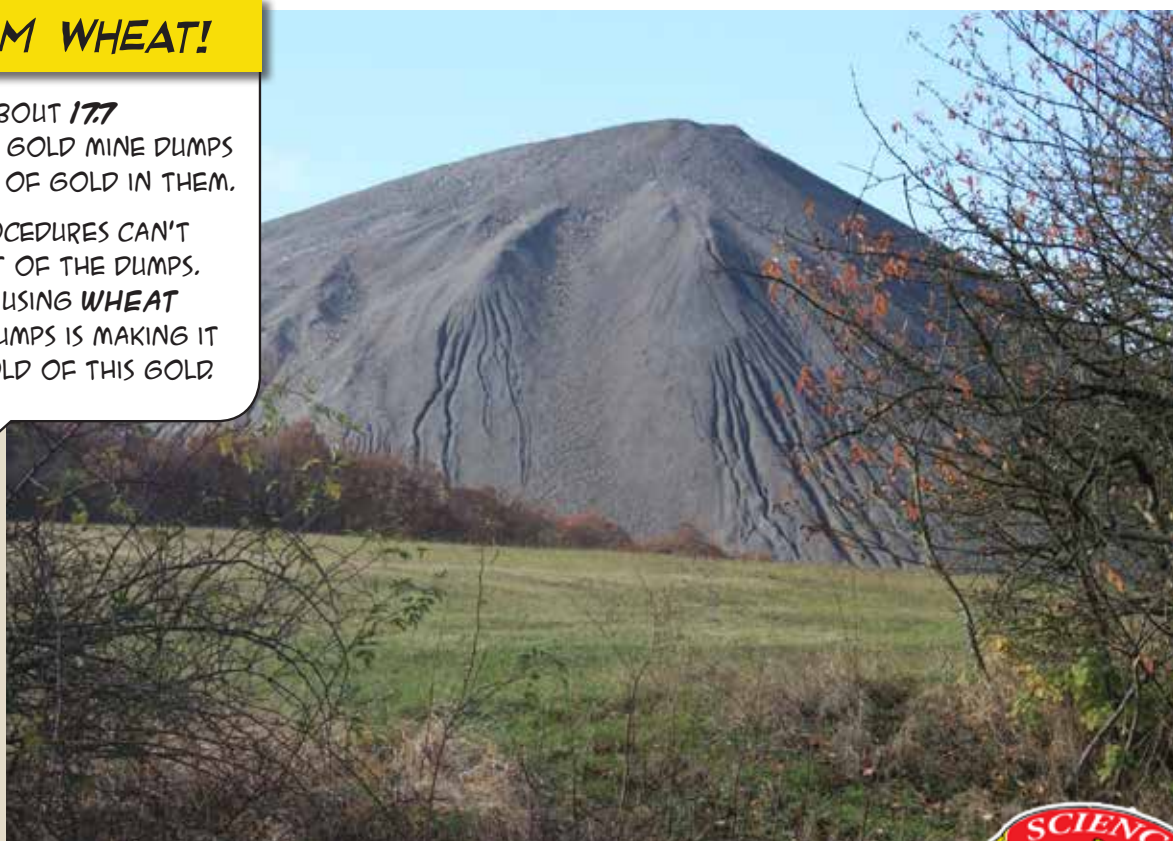
PHYTOMINING



GOLD FROM WHEAT!

SOUTH AFRICA HAS ABOUT **177 MILLION TONS** OF GOLD MINE DUMPS WITH TINY AMOUNTS OF GOLD IN THEM.

NORMAL MINING PROCEDURES CAN'T TAKE THIS GOLD OUT OF THE DUMPS. BUT A NEW METHOD USING **WHEAT** GROWING ON THE DUMPS IS MAKING IT POSSIBLE TO GET HOLD OF THIS GOLD.



Knowledge is Ncah!



CHANGING A FLOWER'S COLOUR

- 1** FIND A LIGHT COLOURED FLOWER – WHITE IS THE BEST COLOUR.



- 2** CHANGE THE COLOUR OF WATER BY USING SOME FOOD COLOURING. INSTEAD OF FOOD COLOURING, YOU CAN ALSO CHANGE THE COLOUR OF THE WATER BY BOILING EITHER BEETROOT OR RED CABBAGE IN THE WATER.



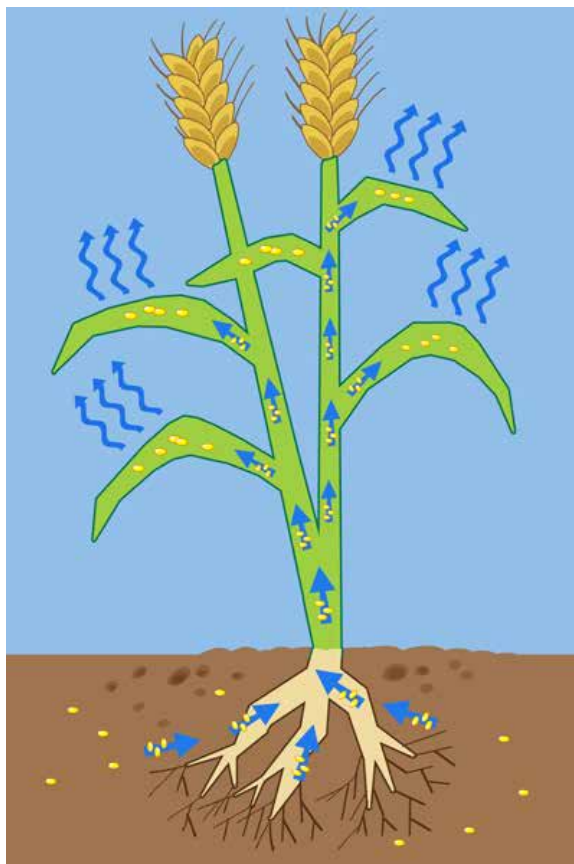
- 3** STAND THE STEM OF THE FLOWER IN THE COLOURED WATER AND PUT THE FLOWER IN A SUNNY SPOT FOR A DAY OR SO – WATCH THE COLOUR OF THE PETALS OF THE FLOWER CHANGE.



GOING UP!

Plants *suck up water* through their roots. In this case, it would be through the stem.

The water travels up thin tubes called *xylem vessels* and into the leaves, petals and other parts of the plant.



Anything that is dissolved in the water is taken into the plant too – this is called *translocation*. Often what is dissolved in the water is deposited (left there) in the plant.

This is what happened with the Food colouring in the petals, and it is what happens with the gold in the wheat.

AND THE GOLD WINNER IS...



Tshiamo Legoale is a South African researcher, from the company called Mintek, who won an international competition – Famelab – for presenting her work on using wheat to get gold out of mine dumps.

The wheat plant helps the gold *dissolve* in *water* in the ground, and then sucks it up with the water. The gold is deposited in the stem and leaves – but not the seeds.



SO THE WHEAT SEEDS CAN STILL BE HARVESTED TO MAKE FLOUR, AND THE REST OF THE PLANT IS THEN BURNED. IN THE ASH YOU WILL FIND SMALL AMOUNTS OF GOLD!

CAREERS:

Botanists study different things about plants – such as the relationship of plants to each other, or how they work, or even breeding new varieties of plants.

Geologists study different things about the earth – such as rocks and the chemical and biological changes in the earth.

Environmentalists are interested in or study the environment and protect it from being damaged.



Tshiamo Legoale works for Mintek as a geologist. She is researching phytomining using wheat to extract gold from mine dumps. Tshiamo was crowned the 2017 Famelab winner where her passion for her work was clearly shown. Watch her winning presentation on YouTube – search for Famelab 2017 winner.

CURRICULUM LINKS

- **GRADE 7: Life Sciences** – Matter and Materials
- **GRADE 8: Life Sciences** – Life and living – Interactions and interdependence within the environment
- **GRADE 10: Life Sciences** – Life processes in plants and animals (support and transport systems in plants)

SOLVE A PROBLEM...

People looked at the mine dumps and realized they could get the tiny bits of gold out using the natural process of translocation.

Now it is your turn to solve a problem:

- Look around your community for problems that need to be solved. Choose one problem that you have identified in your club.
- Have a discussion in your club to see if you can come up with some solutions for the problem.
- Ask an adult to help you to try out one or some of your solutions to see if you can solve the problem.



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!

SEND US SOME PICTURES AND A SHORT DESCRIPTION OF THE PROBLEM YOU FOUND IN YOUR COMMUNITY AND HOW YOU PLAN TO SOLVE IT.



science & technology
Department:
Science and Technology
REPUBLIC OF SOUTH AFRICA

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.

Backed by their commitment to innovation and their world-class research and development expertise, Mintek is a leading provider of minerals processing and metallurgical engineering products and services world-wide.



CENTRE FOR
SCIENCE & SOCIETY
IN AFRICA

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

