No. 58

SCIENCE SPAZA

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GERMS, WATCH OUT!

A SECRET WEAPON

GERMS ARE ALSO KNOWN AS **MICROBES** - SMALL LIVING THINGS. THEY ARE SO SMALL THAT YOU WOULD NEED A **MICROSCOPE** TO SEE MOST OF THEM. BUT EVEN THOUGH YOU CAN'T SEE THEM, THEY ARE STILL THERE.

THERE IS A NEW TECHNOLOGY THAT IS PUT ON A SURFACE AND KILLS THESE MICROBES IF THEY LAND ON IT. WE SAY THAT THE SURFACE IS **"ANTIMICROBIAL"**.

THIS AMAZING TECHNOLOGY HAS BEEN DEVELOPED **RIGHT HERE** IN SOUTH AFRICA!

Escherichia coli: Scanning electron micrograph of the bacteria E-coli
(Wikipedia)

DSI-NRF CENTRE OF EXCELLENCE IN STRONG MATERIALS

Knowledge is Ncah!

SCIENCE SPAZA

WHAT KILLS MICROBES?

THIS IS AN EXPERIMENT THAT WILL SHOW YOU WHAT AN ANTIMICROBIAL SUBSTANCE IS...

YOU WILL NEED:

- 2 SLICES OF OLD BREAD
- 2 PLASTIC PACKETS
- WATER
- HOUSEHOLD BLEACH (LIKE **JIK**)

1

- POUR SOME WATER OVER ONE OF THE SLICES OF BREAD SO THAT IT IS DAMP, BUT NOT SOAKING.
- DO THE SAME FOR THE SECOND SLICE OF BREAD, BUT USE BLEACH INSTEAD OF WATER (BE CAREFUL NOT TO GET THE BLEACH ON YOUR CLOTHES).

2 PLACE THE TWO SLICES OF BREAD OUTSIDE IN THE SHADE FOR 5 MINUTES.

3 PUT EACH SLICE OF BREAD INTO A SEPARATE PLASTIC BAG AND SEAL THEM.

4 PUT THE PLASTIC BAGS INTO A DARK PLACE (SUCH AS A CUPBOARD) FOR ABOUT A WEEK.

5 AFTER A WEEK IN THE DARK PLACE, OPEN THE PACKETS CAREFULLY AND LOOK INSIDE. WHAT DO YOU NOTICE? IS THERE A DIFFERENCE BETWEEN THE BREAD THAT HAD WATER ON IT AND THE ONE THAT HAD BLEACH ON IT?

WHAT'S HAPPENING HERE?

IN YOUR EXPERIMENT, YOU SHOULD HAVE SEEN ***MOLD*** GROWING ON THE BREAD.

HOW DID THIS HAPPEN? TINY, MICROSCOPIC ***SPORES***, WHICH YOU CANNOT SEE LANDED ON THE BREAD. THEY GREW INTO THE HAIRY LOOKING MOLD.

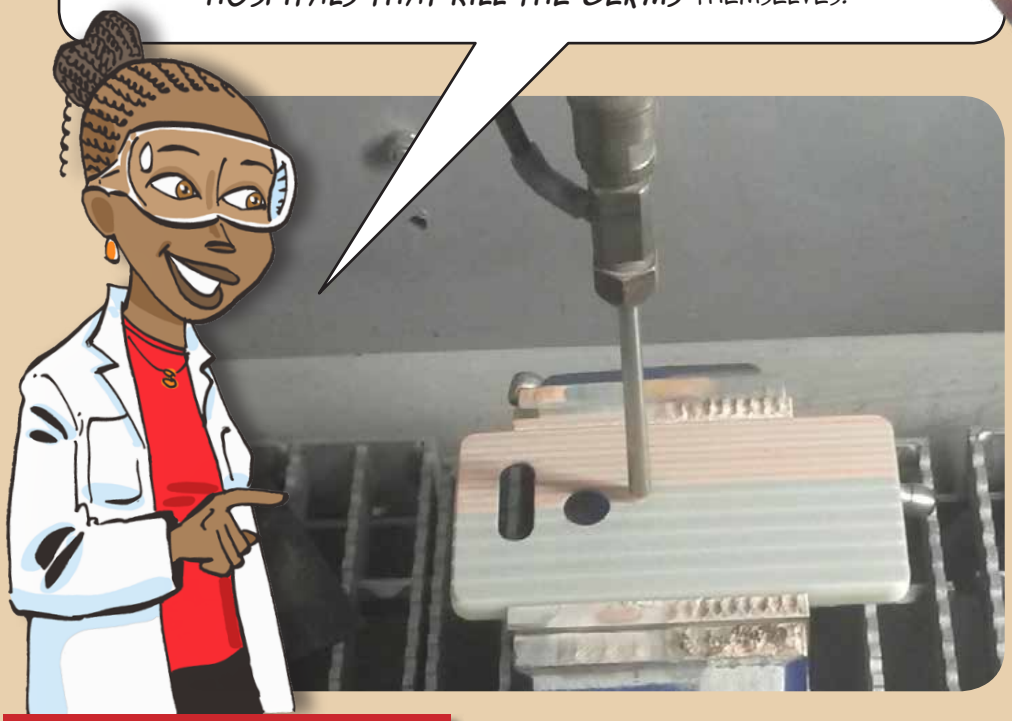
BUT YOU SHOULD NOTICE THAT THERE IS NO MOLD, OR A ***LOT LESS***, ON THE BREAD THAT HAD ***BLEACH*** ON IT.

THIS IS BECAUSE BLEACH IS AN ***ANTIMICROBIAL SUBSTANCE*** – IT KILLS MICROBES. SO, ANY SPORES THAT LANDED ON THE BLEACH WERE KILLED AND DID NOT GROW.

BLEACH IS NOT THE ONLY SUBSTANCE THAT IS ANTIMICROBIAL – SOME ***METALS*** ARE TOO!

NO GERM ZONE!

A SOUTH AFRICAN RESEARCHER, MICHAEL LUCAS, FROM WITS UNIVERSITY, HAS DEVELOPED A WAY OF COATING PLASTIC OBJECTS WITH **ANTIMICROBIAL METALS.** HIS FIRST **ANTIMICROBIAL OBJECT** WAS A CELL PHONE COVER, BUT HE IS PLANNING TO DO THE SAME ON OBJECTS USED IN HOSPITALS. HOW AWESOME IS THAT – **HOSPITALS THAT KILL THE GERMS** THEMSELVES!



An antimicrobial cell phone cover.
Sources: Michael Lucas

A cell phone cover being coated with antimicrobial copper and zinc.
Sources: Michael Lucas

CAREERS:

Mechanical engineers use physics, maths and material science to design and make machines. A mechanical engineer would have designed the machine that cold sprays the antimicrobial metal onto surfaces.

Microbiologists study and understand how to control microbes such as bacteria and molds. A microbiologist would test to see if the antimicrobial substance was effective in killing germs. They also understand how to use good microbes to make products, for example foods like cheese, bread and yoghurt.

Designers use creativity and computer design programs (CAD programs) to design and create objects. A designer would have designed and created the cell phone cover that was made antimicrobial. They use machines such as 3D printers in their designing and creating.

Michael Lucas has a degree in Engineering and is working towards his PhD. He has developed a way to make objects that are antimicrobial using 3D printing and a technique called cold spraying. He has won a number of awards, including some international ones, for his work. Here is a South African who is doing cutting edge science!

CURRICULUM LINKS

- **Grade 7 Natural sciences:** Matter and Materials - Introduction to the periodic table of elements.
- **Grade 7 Technology :** Design process skills
- **Grade 8 Natural sciences:** Life and Living (Micro-organisms); Matter and Materials - Atoms
- **Grade 9 Technology :** Design skills

PUZZLE YOUR MIND!!!

USE THE CLUES TO FILL IN THE CROSSWORD:

Across

4. The technique that is used to put the antimicrobial metals onto surfaces.

6. One of the antimicrobial metals used on the cell phone cover.

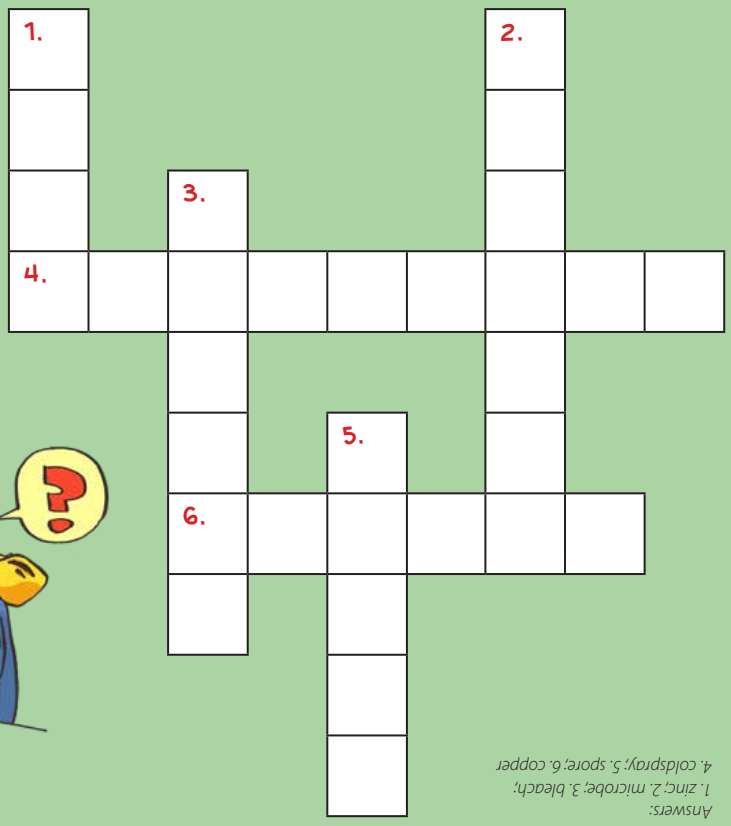
Down

1. An antimicrobial metal.

2. A germ that can only be seen using a microscope.

3. A liquid that kills microbes.

5. A mold will grow from a microscopic _____.



Answers:
1. zinc; 2. microbe; 3. bleach; 4. coldspray; 5. spore; 6. copper

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School: _____

Name: _____

Telephone number: _____

Email address: _____

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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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