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

SCIENCE SPAZA

www.sciencespaza.org

FUN WITH ROBOTS

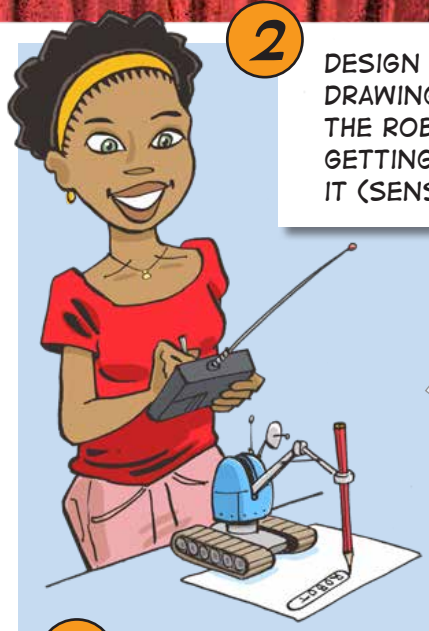
HOW DO ROBOTS WORK?

DESIGN AND BUILD YOUR OWN ROBOT

1. THINK OF A TASK THAT IS BORING OR UNSAFE FOR HUMANS, THAT COULD BE DONE BY A ROBOT. WHAT STEPS (OR PROCESSES) MUST THE ROBOT DO? WRITE THE STEPS DOWN ON A SHEET OF PAPER WITH THE ORDER OF TASKS.

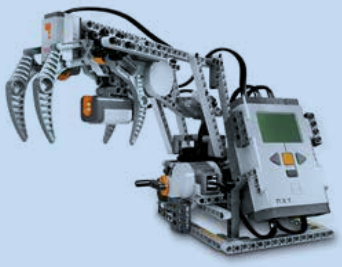
YOU WILL NEED:

- A CLEAN SHEET OF PAPER AND A PENCIL
- ANY USEFUL MATERIALS, SUCH AS PLASTIC BOTTLES AND LIDS, OLD BOXES, TIN FOIL, ICE CREAM CONTAINERS, OLD CLOTHING, STRAWS, GLUE, STAPLES, PAPER AND CRAYONS



2 DESIGN A ROBOT TO DO THIS TASK. START BY DRAWING IT ON A CLEAN SHEET OF PAPER. HOW IS THE ROBOT CONTROLLED? DOES IT HAVE A WAY OF GETTING INFORMATION ABOUT THE WORLD AROUND IT (SENSORS).

3 NOW BUILD A MODEL OF YOUR ROBOT USING THE MATERIALS THAT YOU HAVE GATHERED.



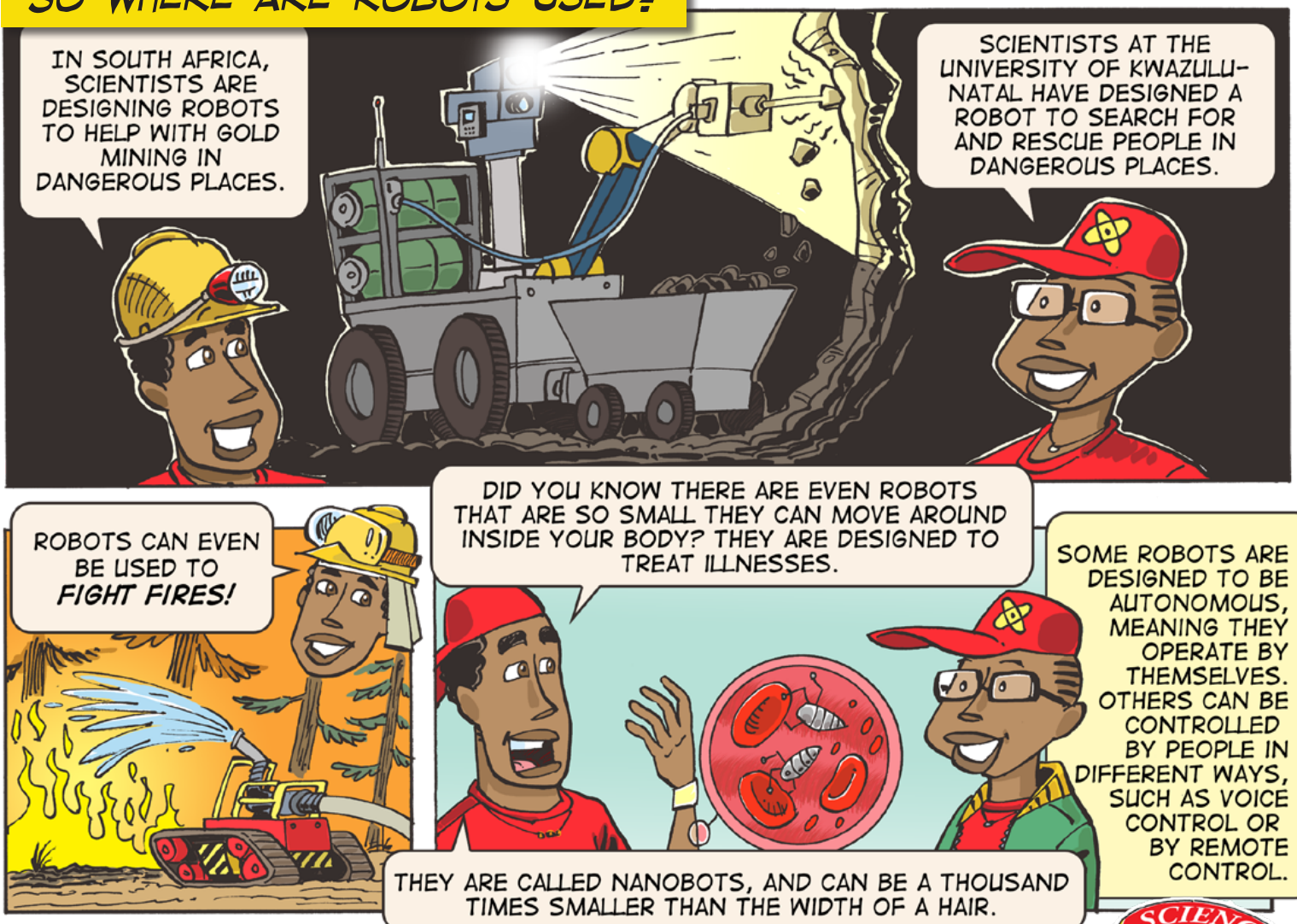
4 EVALUATE YOUR ROBOT CONSTRUCTION USING THE FOLLOWING QUESTIONS:

A. IS YOUR CONSTRUCTION STURDY AND STRONG?

B. DOES THE ***DESIGN*** LINK WITH THE ***PURPOSE*** OF THE ROBOT?

5 PRESENT YOUR ROBOT TO OTHER MEMBERS OF YOUR SCIENCE CLUB. DESCRIBE HOW YOUR ROBOT CAN BE USED TO DO THE TASK YOU DESIGNED IT FOR. DISCUSS WHETHER THE STEPS ARE THE RIGHT ONES.

SO WHERE ARE ROBOTS USED?



PUZZLE YOUR MIND!!!

FIND THE LISTED WORDS IN THE PUZZLE BLOCK, AND DRAW A RING AROUND EACH WORD. THE WORDS RUN IN ALL DIRECTIONS, SO LOOK CAREFULLY!

I	S	M	C	T	S	A	R	I	C	T	A	O
L	T	E	G	O	L	U	O	I	O	E	I	R
A	T	N	U	N	A	T	N	R	N	D	R	C
C	B	I	T	S	I	O	O	B	T	E	M	D
I	R	C	U	U	R	N	S	B	R	C	N	E
N	E	I	S	T	E	O	I	D	O	A	T	S
A	S	D	C	L	T	M	S	M	L	N	A	I
H	G	E	G	O	A	O	P	N	S	I	A	G
C	L	M	B	R	M	U	E	I	E	A	U	N
E	N	O	S	C	T	S	C	R	E	S	A	B
M	R	F	E	E	D	B	A	C	K	U	T	E
T	N	N	R	D	E	V	I	C	E	V	E	E
R	E	M	O	T	E	C	C	R	I	T	R	C

ROBOT
MECHANICAL
COMPUTER
ELECTRONIC
MARS
MINING
DESIGN
NANOBOT
MEDICINE
DEVICE
BUILD
MATERIALS
AUTONOMOUS
CONTROL
FEEDBACK
SENSORS
REMOTE

WHEN A ROBOT RESPONDS TO INFORMATION RECEIVED FROM ITS SENSORS, THIS IS CALLED ___?

Answer: feedback

CAREERS

THERE ARE GREAT JOB OPPORTUNITIES, SUCH AS:

- MECHANICAL, ELECTRONIC OR COMPUTER ENGINEER
- IN THE FIELD OF AERONAUTICS
- MEDICAL TECHNOLOGIST
- MINING ENGINEER
- MECHATRONICS ENGINEER

CURRICULUM LINKS

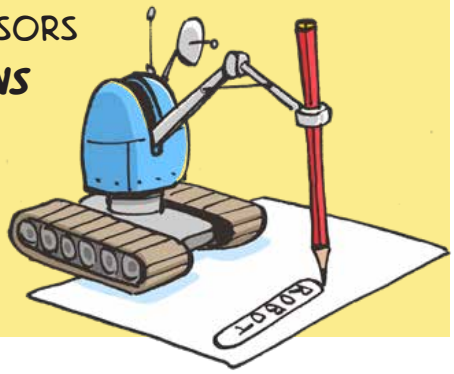
GRADE 7 TO 9 TECHNOLOGY:

- DESIGN PROCESS SKILLS
- MECHANICAL SYSTEMS AND CONTROL
- COMMUNICATION SKILLS

Science Spaza is grateful to Dr Riaan Stopforth, Mechatronics and Robotics Research Group, University of KwaZulu-Natal for his contributions to this resource.

DID YOU KNOW?

MATHEMATICS IS USED TO ***CONVERT*** INFORMATION GATHERED BY A ROBOT'S SENSORS INTO ***INSTRUCTIONS*** THAT THE ROBOT FOLLOWS.



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

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START YOUR OWN SCIENCE SPAZA

REGISTER NOW TO RECEIVE ***FREE*** RESOURCES AND SUPPORT. *YOU WILL NEED:*

1. A GROUP OF FRIENDS WHO ARE EXCITED ABOUT SCIENCE!
2. A PARENT OR TEACHER TO ASSIST YOU
3. A TIME AND PLACE TO MEET
4. SOME ***CURIOSITY*** AND AN INTEREST IN FINDING OUT MORE ABOUT THE WORLD!

SCIENCE SPAZA APPLICATION FORM

Name of school: _____

Municipality: _____

Province: _____

Name of your science club:

_____

Name of contact person: _____

Telephone number: _____

Email address: _____

Postal address: _____

_____

To be filled in by responsible adult (parent/teacher)

Name: _____

Surname: _____

Position: _____

ID Number: _____

Signature (parent/teacher):

_____

Date: _____

Send to PO Box 22106, Mayor's Walk, 3208 Fax to 086 610 5453 email: info@sciencespaza.org or submit your application online at www.sciencespaza.org

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