UNIVERSITY OF KWAZULU-NATAL ™

INYUVESI YAKWAZULU-NATALI

STEC@UKZN

Workshops

Primary Schools

University of KwaZulu-Natal

Science and Technology Education Centre

H1 Building, Westville Campus

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Science4U mobile outreach unit

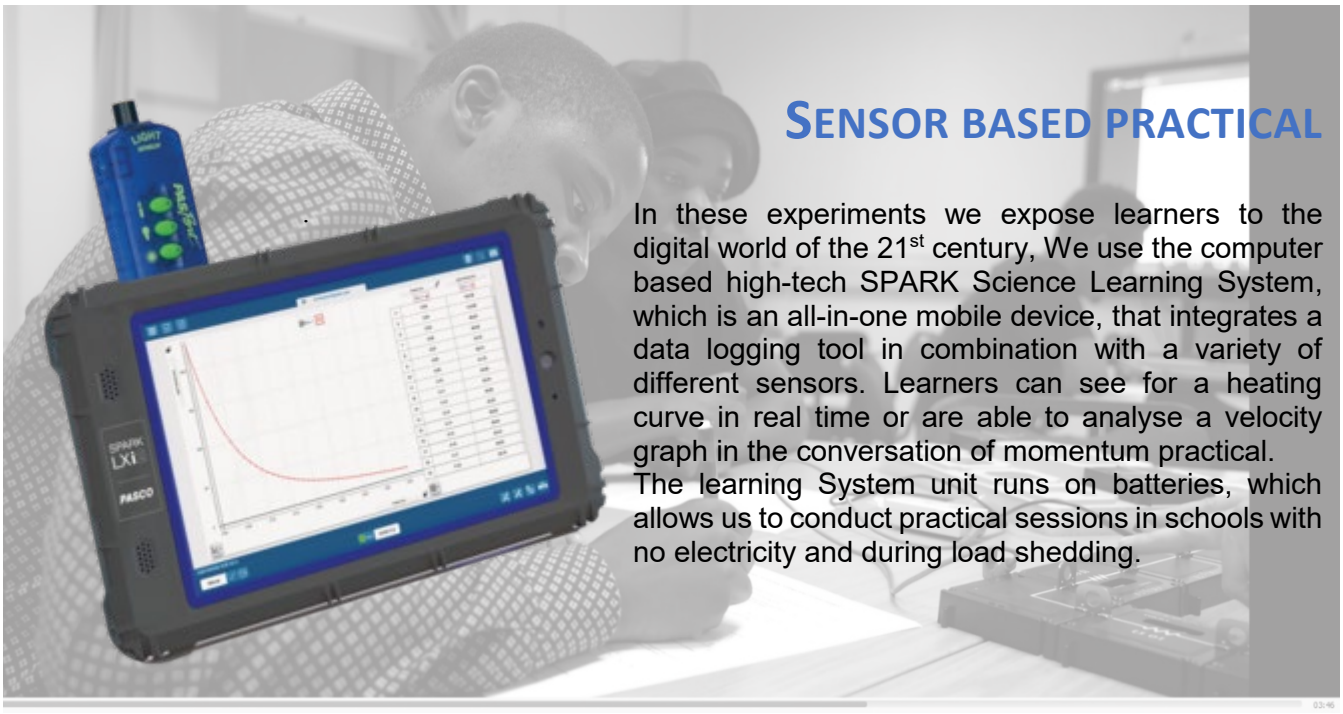
Sponsored by the Embassy of Japan, the Science4U mobile science lab is a Mercedes Vito van which is equipped with experiments in the field of, physics and chemistry that goes out to schools, to provide hands on activities and lab experiences to learners that don't have access to science labs. We offer CAPS related sensor-based practical's, coding and robotics, and numerous other workshops from different fields. Please have a look at our list of workshops. All our hands-on activities are also offered in the science centre.

Fees return trip

0-50 km return: free
50-100 km return: R 500
100-200 km return: R 800
Above 200 km: on request

We charge ***R 25 per learner*** for a workshop.*
Teachers are free.

*Special concessions can be made for non-fee-paying and low-income schools.



SENSOR BASED PRACTICAL

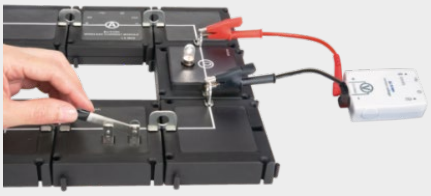
In these experiments we expose learners to the digital world of the 21st century, We use the computer based high-tech SPARK Science Learning System, which is an all-in-one mobile device, that integrates a data logging tool in combination with a variety of different sensors. Learners can see for a heating curve in real time or are able to analyse a velocity graph in the conversation of momentum practical.
The learning System unit runs on batteries, which allows us to conduct practical sessions in schools with no electricity and during load shedding.

THE POWER OF INSULATION

Can we stop ice from melting? Do you want to learn about materials and their special powers? Who can make their ice last longer? Explore the world of insulation, in a fun and exciting way.

Grade: 3

Duration:
60 min



SIMPLE CIRCUITS

Learners connect a cell, wires, and a light bulb to make a simple circuit. What will happen if you add another cell to your circuit?

Grade: 5+

Duration:
60 min

CAPS

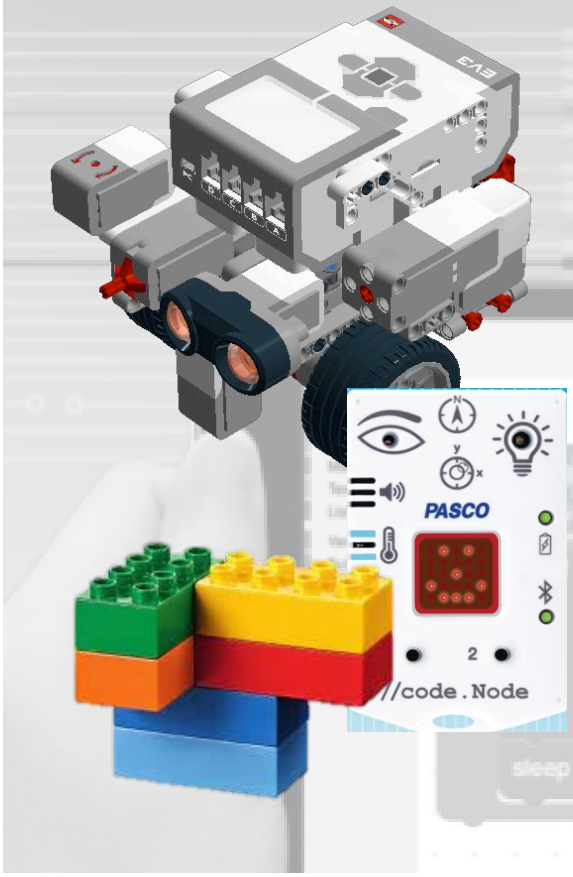
FRUIT CELL BATTERY

Can we light up an LED light with a lemon? What about potatoes or zucchini? In this workshop learners will construct batteries from various fruits and investigate which one will produce the most electric current.

Grade: 1+

Duration:
60 min

CODING AND ROBOTICS



We offer hands on workshops, from unplugged coding (coding without a computer) to block based coding. Our equipment includes LEGO 6 bricks, LEGO EV3 robots and //code.Nodes.

LEGO 6 BRICKS

In our 6 bricks workshops we introduce simple concepts such as patterns, algorithms and link them to computational thinking concepts that teach learners the foundational knowledge and skills upon which the fields of programming and robotics are built.

LEGO EV3 ROBOTS

Lego EV3 can used for both building and programming robots. The robot will only "come to life" once the learner writes a simple programme in SCRATCH (block based program). The program will give the robot's 'brain' the necessary commands to perform a specific task.

//CODE.NODE

Wireless and easy-to-use, the //code.Node includes six sensor inputs, a speaker, RGB light, and an LED array that enables students to explore exciting phenomena using block-based programs that collect, display, and respond to data.

ENQUIRE ABOUT OUR TEACHER TRAINING WORKSHOPS

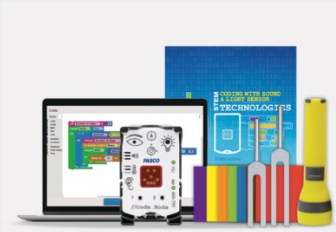
//CODE.NODE: MAGNETISM

Learners program the //code.Node in block coding to determine the polarity of a magnet, using the build in magnetic field sensor.

Grade: 7+

Duration: 60 min

CAPS



//CODE.NODE: RGB LED COLOUR PROGRAMMING

Using the //code.Node, learners will alter the intensity of the individual lights on the RGB LED to create an array of colors and demonstrate knowledge of color mixing using the RGB color model.

Grade: 7+

Duration: 60 min

CAPS

//CODE.NODE: CLAP ON

Learners are introduced to an invention from the 1980's that allows you to turn lights on and off by clapping your hands. Learners then use Blockly to program their //code.Node to behave in the same way.

Grade: 7+

Duration: 60 min

CAPS

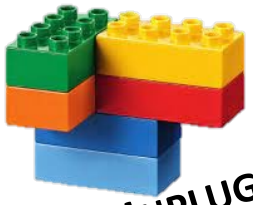
LEGO 6 BRICKS 1: CROSSING THE LINE

Just like robots are provided with basic instructions, learners will receive a series of instructions (moves). The learners carry out the instruction by moving the corresponding brick to the required new position. A great introductory activity into robotics.

Grade: 1+

Duration:
30 min

CAPS



LEGO 6 BRICKS 2: PATTERNS

In this workshop we explore the concept of patterns and the decomposition of patterns.

Grade: 1+

Duration:
30 min

CAPS

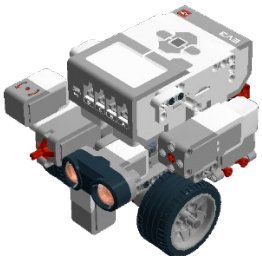
CODING UNPLUGGED: CUP STACKING

Using a predefined “Robot Vocabulary” the learners have to give instructions to one another on how to stack cups in a specific way. The learner will be introduced to concept of symbols and actions, as well as the valuable skill of debugging..

Grade: 1+

Duration:
30 min

CAPS



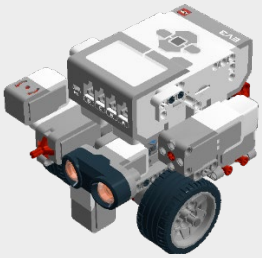
EV3 – PROGRAMMING A ROBOT – LEVEL 1

LEARN HOW TO PROGRAM A ROBOT TO MOVE AND PERFORM A NUMBER OF TASKS USING EASY-TO-USE CODING SOFTWARE.

Age:
9+

Duration:
60-120 min

CAPS



EV3 – PROGRAMMING A ROBOT – LEVEL 2

IN THIS WORKSHOP LEARNERS WILL PROGRAM VARIOUS SENSORS TO MAKE THE ROBOT SENSE ITS ENVIRONMENT AND RESPONDS WITH SOUND AND LIGHT .

Age:
9+

Duration:
60-120 min

CAPS

We offer a variety of different workshops for all age groups and across all STEAMI subjects. This includes or sensor-based practical's (page 2). and coding/ robotics workshops (page 3).

Can't find the workshop you are looking for? Speak to us and we can see if we can custom make a workshop for you.

Please note that we also offer all workshops in our Science4U section in the science centre.

We charge ***R 25 per person/ learner*** for a workshop.*
Teachers don't have to pay.

*Special concessions can be made for non-fee-paying and low-income schools.

Wandering continents

Come and catch the drift! Using “playtectonics” we embark on a journey through time to explore Wegener’s hypothesis of the wandering continents and as shift happened on how geological evidence was used to support the theory of plate tectonics.

Grade: 5-12

Duration: 60 min

CAPS

Earthquakes

In this workshop learners will use and interpret real earthquake data. By analysing the data learners are able to recognize plate boundaries and to develop a basic tectonic map. They will also be able to make deductions on the location and the type of plate boundaries. This workshop will be in conjunction with a basic lecture on earthquake.

Grade: 4-12

Duration: 60-90 min

Maximum: 70

CAPS

Inside world of minerals

Crystallography is the science that examines the arrangements of atoms in solids. It helps scientist to understand the relationship between the atomic structures and the properties of for example minerals. In our workshop we let you rebuild the atomic arrangement of a mineral using "special atoms" and you have to find out what mineral we are looking at.

Grade: 4-12

Duration: 60-90 min

What rock is it?

Using tools provided (glass, hand lenses/ magnifying glasses, diluted HCL acid, steel nail) the learners determine the characteristics of different rock samples and try to identify the various rocks. Challenge your learners. Who can identify most of the rocks?

Grade: all

Duration: 60-90 min

Discovering Volcanoes

Volcanic eruptions are among the Earth’s most powerful and destructive forces. Make your own erupting volcano and learn more about why volcanoes erupt.

Grade: 1-7

Duration: 60 min

Dinosaur mystery

A bone of the dinosaur Anatotitan has been found in the middle of nowhere. Can we solve the mysterious death of the dinosaur Anatotitan with the help of this bone? Explore the world of dinosaurs by learning more about the process of fossilasation and to how read the fossil history.

Grade: 1-4

Duration:
60 min

Fossils – window to the past

Take a tour into the past and explore the mystic creatures and plants that once lived on Earth. Learn where one can find fossils and even make your own.

Grade: 1-4

Duration:
60 min

State of matter

Find out more about the exciting world of solids, liquids and gasses. In a fun and interactive way learn more about how atoms and molecules behave when they move from one state to another state.

Grade: 4

Duration:
60 min

CAPS

Secret message

Ever wanted to become a spy? One of the main tasks of spies is to exchange messages, while at the same time keeping the contents a secret from anyone who may intercept it. Make you own encryption machine and learn how to encrypt and decrypt secret messages using for example Caesar's cypher and the Enigma machine.

Grade: 5+

Duration:
60 min

Renewable Energy

What is renewable energy and how can ecological electric power be produced? In this workshop learners will investigate the various ways on how to generate electricity from non-renewable and renewable energy sources. The workshop will help learners to understand the energy forms of the future by building a model such as a car driven by renewable sources such as the sun.

Grade: 7+

Duration:
~120 min

CAPS

WHY DOES SOME FOOD TASTE SOUR?

Can we tell how sour food is, without tasting it? Do you know how antacids work? In this workshop the learners measure the pH of various household chemicals and learn more about the pH of sour food and other household chemicals.

Grade: 3+

Duration:
60 min

SIZING UP THE SOLAR SYSTEM

Our solar system is an exciting place. It is full of planets and other strange objects. Some are big and some are small. Some are close and some are very far away. Let's find out how big is big, and how far away we really are from our neighbouring planets. And where our space in the solar system is.

Grade: 4+

Duration:
60 min

CAPS

SMART MATERIALS

In modern times, scientists have learned more about what gives materials their unique properties, and this has opened up possibilities for designing materials with interesting properties .In this workshop we will explore some of these exciting materials and will investigate what happens to these materials when we change the temperature or expose the material to water and UV light.

Grade: 1+

Duration:
60 min

COLOURS

Learn more about primary and secondary colours and create your very own rainbow in test tubes. Find out what happens if we put drops of dishwashing liquid and colour in milk.

Grade: **R**-2

Duration:
60 min

DESIGN YOUR OWN CRAZY MACHINE

Get crazy and make your own machine that can pop balloons, push a toy car or other silly things. The more complicated the better. See magic happening with just one touch and help building an awesome, Rube Goldberg Machine.

Grade:
5 – 99 years

Duration:
60 min

Separating Materials

In the first part of the practical the learners separate dry material using a sieve and a magnet. In the second part learners separate the pigment components mixed in ink using the chromatography process.

Grade: 7

Duration:
60-90 min

CAPS

DNA

All living organisms, such as humans store genetic information using the same molecules — DNA. Your DNA determines what you look like. Learn how to extract DNA and see what DNA looks like. Extract DNA from a banana, using simple household items. Decode a skeletons DNA to recreate the appearance.

Age:
10+

Duration:
60 min

Things that fly

Fasten your seatbelt and be ready for take-off. In this workshop you will launch objects into the air and find out, what keeps them in the air. Build various objects that fly (paper helicopter, hoop glider and paper planes) and explore how those different kind of objects can fly.

Age:
5+

Duration:
60 min