

WCED MOBILE SCIENCE CENTRE

Science on the move at your school. Request a visit from our WCED Mobile Science Centre and we will bring science to your school. Visits can include interactive exhibits, an inflatable planetarium and a science show. See the relevant programme below:



PRIMARY SCHOOLS

Choose from option A or option B

OPTION A – Interactive Exhibits & Science Show

OPTION B – Planetarium Show (See show options on next flap)

HIGH SCHOOLS

There is a great selection of CAPS Gr 10 - Gr 12 practical experiments that we can run at your school. Choose from the following:

GRADE 10: Motion in One Direction
Acceleration
Heating and Cooling Curve of Water
Cation Tests (Flame Tests)
Electric Circuits – Resistance in Series and Parallel
Reaction types
Ripple Tank
Magnetic Fields
Conservation of Matter

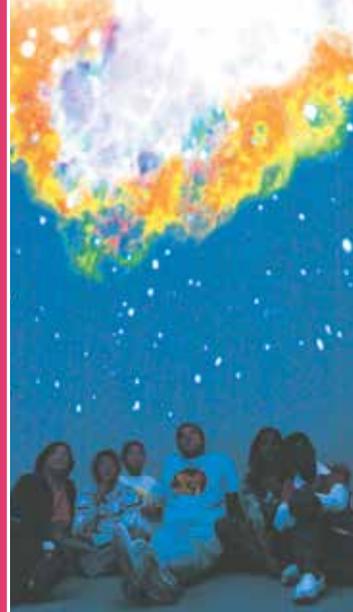
GRADE 11: Ohm's Law
Intermolecular Forces
Newton's 2nd Law of Motion
Snell's Law
Exothermic & Endothermic Reactions
Reaction Rate
Forces on a single plain using a Force Board
Quantitative Analysis
Boyle's Law

GRADE 12: Titrations
Esters
Conservation of Linear Momentum
Internal Resistance of a Battery
Value of "g"
Equivalent Resistance of series/parallel network of known resistors

However, if you prefer to select option A or B from the Primary Schools options then please feel free to do so.

PLANETARIUM

The WCED Inflatable Planetarium is an immersive environment that promotes learning about our universe – planets, eclipses and inventions that helped shape the way we see the universe today.



SHOWS ON OFFER:

EARTH'S WILD RIDE

Duration 20mins | Ages 5+

Learn about solar eclipses, the ice age, volcanoes, extinction of the dinosaurs, the water cycle and food chains in this exciting show as seen from the perspective of a family living on the Moon.

THE SECRET OF THE CARDBOARD ROCKET

Duration 40mins | Ages 5+

Discover the planets in our Solar System in this imaginative journey through space in a cardboard rocket.

TWO SMALL PIECES OF GLASS

Duration 20mins | Ages 5+

Discover the history of the telescope and learn about the Hubble telescope, the radio telescope and huge land based telescopes in this informative show.

HOME SCHOOL PROGRAMME

The Cape Town Science Centre offers bespoke hands-on workshops and activities for home schooled learners to assist with practical experiments that can't be done at home.

To book a Home School visit please note the following:

- A group of 10 learners or more of similar academic level is required
- Two experiments can be conducted per session – Please identify which experiments you would like conducted. See list of experiments on the inside of this brochure.
- A booking needs to be made with Portia (Bookings Coordinator) – portia@ctsc.org.za or 021 300 3200

SCHOOL GROUP VISITS

Visits to the CTSC are suitable for all grades. Each visit should last at least two hours and booking is essential!

- A **General Visit** includes a science show, use of interactive displays, a visit to the current exhibitions and a tour of the Camera Obscura.
- A **Workshop Visit** includes a pre-booked workshop (workshop details inside) and a general visit.

Teacher pre-visits are strongly recommended to ensure your visit is structured to meet the needs of your group.

WORKSHOP VISIT OPTIONS:

FOUNDATION PHASE

Option 1 – 3 hour visit

- Exploration of the exhibition floor
- Concor Building Site
- Curriculum based workshop (selected from programme)
- Science Show
- Bee Bots activity
- Snack Break

Option 2 – 3 hour visit

- Exploration of the exhibition floor
- Fun maths activity
- Curriculum based workshop (selected from programme)
- Maths show
- LEGO Design or Planx activity
- Snack Break

Option 3 – 2 hour visit

- Exploration of exhibition floor
- Concor Building Site
- Curriculum based workshop (selected from programme)
- Puppet Show
- Snack Break

INTERMEDIATE PHASE

Option 1 – 3 hour visit

- Exploration of the exhibition floor
- Concor Building Site
- Curriculum based workshop (selected from programme)
- Science Show
- Camera Obscura or Planetarium Show
- Snack Break

Option 2 – 3 hour visit

- Exploration of the exhibition floor
- Coding workshop (1hr) OR Minecraft workshop (1hr)
- Curriculum based workshop (selected from programme)
- Science Show
- Snack Break

Option 3 – 3 hour visit

- Exploration of the exhibition floor
- Fun maths activity
- Curriculum based workshop (selected from programme)
- Camera Obscura or Planetarium Show
- Maths Show
- Snack Break

SENIOR PHASE

Option 1 – 3 hour visit

- Exploration of the exhibition floor
- Space science or Geo-science activity
- Curriculum based workshop (selected from programme)
- Science Show
- Camera Obscura or Planetarium Show
- Snack Break

Option 2 – 3 hour visit

- Exploration of the exhibition floor
- Coding (1hr) OR Minecraft workshop (1hr)
- Curriculum based workshop (selected from programme)
- Science Show
- Snack Break

Option 3 – 3 hour visit

- Exploration of the exhibition floor
- Fun maths activity
- Curriculum based workshop (selected from programme)
- Camera Obscura or Planetarium Show
- Maths Show
- Snack Break

SIGN UP FOR CTSC E-NEWS!

Keep up to date with all programmes, events and special activities planned for teachers and learners at the CTSC.
Sign up: www.ctsc.org.za

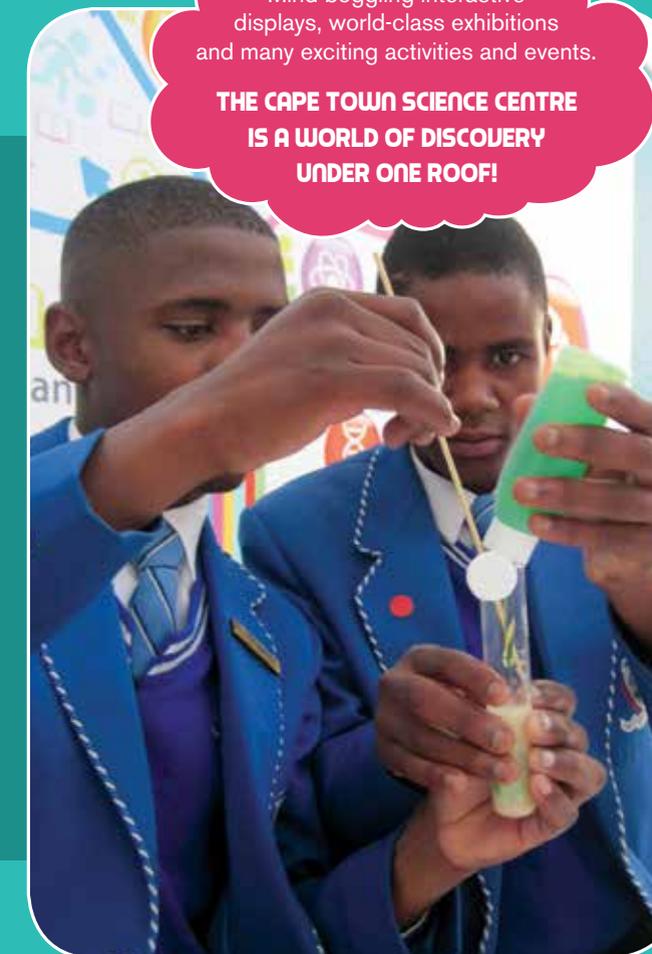


CAPE TOWN SCIENCE CENTRE EDUCATION PROGRAMME 2018



Mind boggling interactive displays, world-class exhibitions and many exciting activities and events.

**THE CAPE TOWN SCIENCE CENTRE
IS A WORLD OF DISCOVERY
UNDER ONE ROOF!**



CAPE TOWN SCIENCE CENTRE

370B Main Road, Observatory | www.ctsc.org.za
t: 021 300 3200 | f: 086 519 7227

WORKSHOPS FOR LEARNERS

A strategic objective of the CTSC is to support both learners and educators by aligning our programmes with the National Curriculum and Assessment Policy Statements (CAPS)

FOUNDATION PHASE	GRADE R	BOOKS Who says libraries are always chilled-out places? Sometimes things get interesting among the stacks and shelves.	HOME A home is a dwelling- a place used as residence for an individual or family and can provide rooms and facilities for sleeping, preparing food, eating, leisure and hygiene.	WOOL FARMING Sheep can stay warm even on cold winter days thanks to their warm wool coat! Some sheep are grown for their meat and milk, which farmers use to make cheese. While others are used for their wool which is used for knitting sweaters and blankets.	DINOSAURS Enjoy our fun dinosaur workshop and learn about everything from the ferocious Tyrannosaurus Rex to the enormous Diplodocus.
	GRADE 1	AT SCHOOL School is where you get an education and gain lots of knowledge about life, society and the world. You also get to learn new skills and have fun.	MY BODY Senses allow us to observe and understand the world around us. There are five main ways we can do this: through sight (with our eyes), touch (with our fingers), smell (with our nose), taste (with our tongue) and hearing (with our ears).	SPECIAL DAYS Most people look forward to special days or holidays. Some days are more special than others because they are symbolic. We observe these special days in various ways.	PICTURE MAPS Though in the age of iPhones and GPSs we seem to be losing paper maps, let's explore maps, and learn map skills, and develop your geography awareness.
	GRADE 2	HEALTHY LIVING Help to save the environment. Learn the science of cleaning and reusing dirty water by conducting interesting water purification experiments. Build your own water filtration using the same method.	SEASONS Seasons are four different times during the year with different types of weather. They are Spring, Summer, Autumn, and Winter. Seasons are caused by the Earth's orbit around the Sun, its rotation on its axis, and its tilt.	SOIL Soil is the loose upper layer of the Earth's surface where plants grow. Soil consists of a mix of organic material (decayed plants and animals) and broken bits of rocks and minerals.	WAYS WE COMMUNICATE People learn and share information through communication. All forms of communication have one thing in common: the sending and receiving of a message.
	GRADE 3	ABOUT ME A timeline is a display of a list of events in chronological order. It is typically a graphic design showing a long bar labelled with dates alongside itself and usually events. Timelines can use any time scale, depending on the subject and data.	INSECTS The insects are the largest group of animals. Insects developed on Earth long before humans did. Today there are about 1 million known species, or types, of insect.	SPACE Space includes living things, planets, stars, galaxies, dust clouds, light, and even time. Before the birth of the Universe, time, space and matter did not exist. The Universe contains billions of galaxies, each containing millions or billions of stars.	DISASTERS AND WHAT WE SHOULD DO Natural disasters are events caused by forces of nature that cause destruction of life and/or property. Well known natural disasters include avalanches, earthquakes, mud slides, volcanic eruptions, floods, tsunamis, cyclones, droughts, tornadoes, forest fires, epidemics and famine.
INTERMEDIATE PHASE	GRADE 4	STRUCTURE OF PLANTS Plants are living organisms that cover much of the land on planet Earth. They can be seen everywhere. They include grass, trees, flowers, bushes, ferns, mosses, and more. Plants are members of the kingdom Plantae.	WAYS TO STRENGTHEN MATERIALS A structure is made of different parts. The way we put these parts together can make a structure strong or weak. Let's have a look at ways to join parts together.	VIBRATIONS AND SOUND Sound waves are formed when a vibrating object causes the surrounding medium to vibrate. A medium is a material in which a wave travels through. As sound waves move through a medium the particles vibrate forwards and backwards.	PHASES OF THE MOON The phase of the moon is how much of the moon appears to us on Earth to be lit up by the sun. Half of the moon is always lit up by the sun, except during an eclipse, but we only see a portion that's lit up.
	GRADE 5	SKELETONS OF VERTEBRATES Skeletons provide the framework for the bodies of most multicellular animals. They lend structural support to soft tissues and give muscles something to attach to and pull against. Without skeletons, most animal bodies would resemble a limp bag of gelatin.	TRADITIONAL PROCESSING We have learnt that there are many different ways in which materials can be processed to give them new properties. After processing they may look, smell, feel or taste different. They will probably also be used for a totally different purpose from before.	ENERGY AND ELECTRICITY Cells and batteries - An electric circuit is like a pathway made of wires that electrons can flow through. A battery or other power source gives the force that makes the electrons move. When the electrons get to a device like a light bulb, they give it the power to make it work.	IMPORTANCE OF SOUTH AFRICAN FOSSILS Fossils are a trace/print or the remains of a plant or animal of a past age preserved in earth or rock.
	GRADE 6	FOOD PROCESSING Food processing is the transformation of raw ingredients, by physical or chemical means into food. Food processing combines raw food ingredients to produce marketable food products that can be easily prepared and served by the consumer.	RATES OF DISSOLVING The dissolving rate depends on the physical and chemical properties of the solute and the solvent as well as on factors such as temperature, pressure, the pH of the solution and the particle size and to the lesser extent the state of subdivision of the solute.	USING ELECTRIC CIRCUITS An electronic circuit is composed of individual electronic components, such as resistors, transistors, capacitors, inductors and diodes, connected by conductive wires or traces through which electric current can flow.	SYSTEMS TO EXPLORE THE MOON AND MARS VEHICLES USED ON THE MOON In 1997, the Pathfinder spacecraft landed on Mars. It had a small rover inside; the Pathfinder opened up and the rover came out and began taking photographs of Mars.
SENIOR PHASE	GRADE 7	BIODIVERSITY CLASSIFICATION OF LIVING THINGS The great variety of life on earth has provided for man's needs over thousands of years. This diversity of living creatures forms a support system which has been used by each civilization for its growth and development.	PROPERTIES OF ACIDS, BASES AND NEUTRALS An acid is a type of chemical that forms solutions that taste sour due to a high concentration of positive hydrogen ions. A base is a type of chemical that forms solutions that taste bitter due to a low concentration of positive hydrogen ions. Acids will react with bases to form salts.	RENEWABLE AND NON-RENEWABLE SOURCES OF ENERGY Non-renewable energy resources, like coal, nuclear, oil, and natural gas, are available in limited supplies. This is usually due to the long time it takes for them to be replenished. Renewable resources are replenished naturally and over relatively short periods of time.	TIDES Tides are the rise and fall of sea levels caused by the combined effects of the gravitational forces exerted by the Moon and the Sun and the rotation of the Earth.
	GRADE 8	TYPES OF MICRO-ORGANISMS/MICROBES Living organisms such as bacteria, fungi, and viruses are too small to be seen with the naked eye but visible under a microscope.	DENSITY OF DIFFERENT MATERIALS Different materials usually have different densities, and density may be relevant to buoyancy, purity and packaging. The density of a material varies with temperature and pressure.	SERIES CIRCUITS Components of an electrical circuit or electronic circuit can be connected in many different ways. Components connected in series are connected along a single path, so the same current flows through all of the components. Components connected in parallel are connected along multiple paths, so the same voltage is applied to each component.	THE MILKY WAY GALAXY The Milky Way is a spiral galaxy with a diameter between 100,000 and 180,000 light years. The Milky Way is estimated to contain 100–400 billion stars. There are probably at least 100 billion planets in the Milky Way.
	GRADE 9	BODY SYSTEMS The digestive system is a group of organs working together to convert food into energy and basic nutrients to feed the entire body. Food passes through a long tube inside the body known as the alimentary canal or the gastrointestinal tract. The alimentary canal is made up of the oral cavity, pharynx, esophagus, stomach, small intestines, and large intestines.	THE GENERAL REACTION OF METALS WITH OXYGEN Metals such as potassium, sodium and lithium react with oxygen very quickly. Calcium and magnesium are slightly less reactive and react with oxygen less quickly. Metals like copper and mercury react with oxygen very slowly and need to be heated continuously in order to see this happening.	TYPES OF FORCES A force is a push or pull acting upon an object as a result of its interaction with another object. There is a variety of types of forces. There are two category headings on the basis of whether the force resulted from the contact or non-contact of the two interacting objects.	THE GREENHOUSE EFFECT The greenhouse effect is the process by which radiation from a planet's atmosphere warms the planet's surface to a temperature above what it would be without its atmosphere. Earth's natural greenhouse effect is critical to supporting life. Human activities, primarily the burning of fossil fuels and clearing of forests, have intensified the natural greenhouse effect, causing global warming.

	FET FORMAL / INFORMAL EXPERIMENT	
FURTHER EDUCATION & TRAINING	GRADE 10	<p>Acceleration - Motion in One Dimension: Let's get moving and explore the science of motion in one direction.</p> <p>Heating & Cooling Curve of Water: Observe the change of state of water graphically.</p> <p>Cation and Anion Tests: Identify cations and anions using flame and precipitation tests.</p> <p>Electric Circuits - Resistance in series and parallel: Construct circuits and use ammeters and voltmeters to measure resistance in series and parallel circuits.</p> <p>Reaction types - Gas forming, precipitation, and Neutralization: Observe the phase state of chemical results of various reactions.</p> <p>Ripple Tank: Discover the constructive and destructive interference of waves.</p> <p>Magnetic fields: Use bar magnets and horseshoe magnets to discover magnetic fields.</p> <p>Conservation of Matter: $Pb(NO_3)_2 + KI, NaOH + HCl, Ca-C-vita + water.$</p>
	GRADE 11	<p>Ohm's Law: Investigate the relationship between voltage, current and resistance.</p> <p>Intermolecular Forces: Boiling points, melting points, surface tension, solubility, capillarity.</p> <p>Newton's 2nd Law of Motion: Investigate the relationship between force and acceleration.</p> <p>Snell's Law: Learn about the refraction of light and how to calculate the refractive index.</p> <p>Exothermic & Endothermic Reactions: Is it an exothermic or an endothermic reaction? Experiment to find out.</p> <p>Reaction Rate: An experiment demonstrating factors that can speed up a chemical reaction.</p> <p>Boyle's Law: Investigate the effects that temperature and pressure have on volume.</p> <p>Quantitative Analysis: Explore mass changes with $Pb(NO_3)_2$ when it is heated it changes to PbO_2.</p>
	GRADE 12	<p>Titration: How to determine the concentration of sodium hydroxide using oxalic acid.</p> <p>Esters: What are they? How do we make them? Discover the sweet smell of esterification.</p> <p>Equivalent Resistance of series/parallel network of known resistors: Using Ohm's law, determine the combined resistance of a series/parallel network of known resistances.</p> <p>Value of "g": Make your own pendulum to determine the value of "g".</p> <p>Determine the internal resistance of a battery: Build an electric circuit and use a known resistor to determine the internal resistance of the battery.</p> <p>Conservation of linear momentum: Use a dynamics trolley and ticker tape to demonstrate conservation of linear momentum.</p> <p>Electrolysis of sodium iodide: Pass an electric current through sodium iodide solution.</p>