

Melbourne Planetarium education kit

Acknowledgements

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Teacher notes

Visiting Melbourne Planetarium at Scienceworks

Planetarium shows consist of a 25 minute presentation in a domed theatre. They are followed by a 10 minute practical guide to 'What's in the sky tonight?'

If the planetarium show is your first programmed activity at Scienceworks, it is important that you arrive about 30 minutes before the show's starting time. This allows time to process payment and store lunches, and for our staff to address your students before proceeding to the planetarium.

Information about the Planetarium show: *Our Living Climate*

Our Living Climate is suitable for students from year 5 – 10 and general audiences.

It looks at the climate of the Earth and explores the following themes:

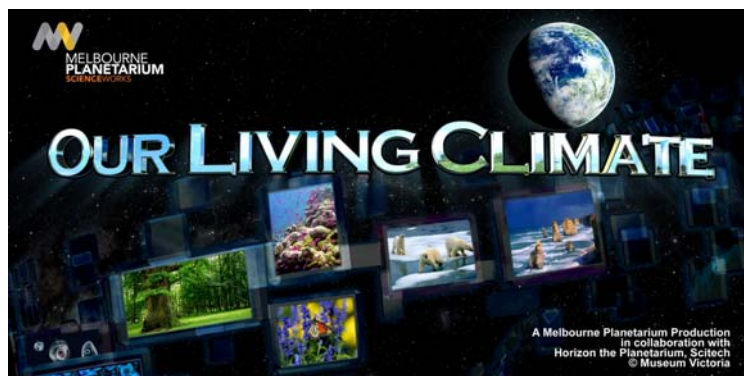
- The Earth's climate is a complex system that has changed over time
- The Earth's atmosphere sustains life and has been built by life
- There are important similarities and differences between Earth and other planets.

The show is in documentary style, using a number of visual techniques to engage the audience and to support the learning themes. It begins with a comparison between the Earth and its nearest neighbours – our Moon and the planet Venus – highlighting the delicate atmospheric balance required to support life.

Next we are immersed in the story of the Earth's climate, travelling through time to view the interactions between life and climate at various stages in the planet's evolution – a mass extinction event, an ice age and the industrial revolution.

We are left with an understanding of how scientists can study constant climate change and how we humans have an opportunity to impact the climate for better or worse. *Our Living Climate* – the greatest scientific challenge of our time.

It is recommended that students are familiar with vocabulary in the *Word list* (pages 5 & 6) and have completed *Activity 1: Climate timeline* before seeing this show.



Our Living Climate was produced by Melbourne Planetarium at Scienceworks, in collaboration with Horizon the Planetarium, SciTech.

Curriculum links

This table shows the links between the school-based activities in this kit and the domains of the Victorian Essential Learning Standards.

VELS Victorian Essential Learning Standards →		Physical, Personal & Social Learning				Discipline-based Learning					Interdisciplinary Learning			
		Health & Physical Education	Interpersonal Development	Personal Learning	Civics & Citizenship	The Arts	English	Languages other than English	Humanities	Mathematics	Science	Communication	Design, Creativity & Technology	Information & Communication
School-based education activities														
Activity 1	Climate timeline		•						•	•				•
Activity 2	Rainfall, weather & climate		•			•			•	•		•		•
Activity 3	Make your own greenhouse			•					•	•			•	
Activity 4	Seasons on other planets		•	•			•			•	•			•
Activity 5	Life on Mars versus life on Earth		•	•	•					•	•			•
Activity 6	Wish you were here			•		•	•		•		•	•	•	•

Word list

Adaptation	Through the process of evolution, organisms that have genetic traits that better suit their environment are more likely to pass on those traits (as they will be more successful at reproducing). Over time the population will have traits that are 'adapted' to the environment.
Atmosphere	The envelope of gases that surround a celestial body. The Earth's atmosphere retains heat from the Sun, and helps to maintain a hospitable climate. The Moon has no atmosphere.
Carbon Dioxide	Carbon dioxide is a molecule made of one carbon and two oxygen atoms. Humans use oxygen from the air when they breathe in and expel carbon dioxide when they breathe out. Plants do the reverse during the day – they take in carbon dioxide and release oxygen.
Climate	The climate of a region refers to the total conditions over a long period of time (often decades or centuries). These conditions include rainfall, temperature, atmospheric pressure and humidity.
DNA	(Deoxyribonucleic acid). One of the 'building blocks of life', the DNA molecules of living organisms contain their genetic information.
Earths Axis	An axis is an imaginary line about which an object rotates. On Earth, the imaginary line joins the North and South Poles.
Ecosystem	A contained system where the animals, plants and environment are interconnected and dependent on each other.
Evolution	The biological process, first described by Charles Darwin, whereby changes occur in a population through random variations from one generation to the next.
Fossil Fuels	Fuels created from organic remains under high pressure for long periods of time. Such 'fossil fuels' (e.g. coal, oil, natural gas) have a high carbon concentration, as did the living things from which they originated.
Genetics	The study of traits passed on from one generation of living things to the next.
Greenhouse Effect	The process where a planet, like the Earth, traps heat from the Sun in its atmosphere, similarly to a greenhouse trapping heat for plants. Molecules of Methane, Carbon Dioxide and Water are responsible for most of the effect on Earth. The higher the levels of these molecules, the stronger the greenhouse effect will be.
Ice Age	A long period of time when the temperature of large areas of the Earth drops and becomes covered with ice sheets.

Magnetic Field	A magnetic field is an invisible area in which objects are subject to a magnetic force. The Earth's magnetic field surrounds the planet and helps to stop the Sun's dangerous radiation from reaching the surface.
Mammals	A class of animals whose young are fed by the mother's mammary glands. All mammals other than the Australian monotremes (platypi and echidnas) give birth to live young.
Mass extinction	Refers to an event that results in the extinction of a large number of species at once, or over a short amount of time.
Molecule	A group of elements that are bonded together, e.g. water is a molecule of one oxygen atom and two hydrogen atoms.
Nebular cloud	The collection of gas and dust that came together because of the force of gravity to form the Sun and the Solar System.
Orbit	An orbit is the path that one (celestial) body makes when moving around another. The path the Earth takes around the Sun is called its orbit. This orbit is nearly circular. Changes in the orbit's shape can affect the Earth's climate.
Primate	An order (a biological grouping) of specific mammals, containing monkeys, lemurs, and apes, or hominoids. Humans are classified as primates (part of the hominoid family).
Surface Temperature	The surface temperature of a planet is the temperature at ground level.
Volcanic	Processes that happen in and around volcanoes.
Weather	Weather refers to the everyday changes in conditions in an area, e.g. whether it is raining, sunny, hot or cold. Weather changes constantly, as opposed to climate, which is the pattern of weather over a long period.

Internet resources

Melbourne Planetarium

<http://museumvictoria.com.au/planetarium/>

The Eight Planets

<http://www.nineplanets.org/>

NASA Solar System Exploration

<http://solarsystem.nasa.gov/index.cfm>

NASA education materials

<http://education.nasa.gov/home/index.html>

Geological Time Chart

<http://www.bgs.ac.uk/education/britstrat/home.html>

NASA Earth Observatory

<http://earthobservatory.nasa.gov/>

Introduction to climate

http://www.ucar.edu/learn/1_2_1.htm

Earth Day Footprint Quiz

<http://www.ecofoot.org/>

Bureau of Meteorology Climate Information

<http://www.bom.gov.au/climate/>