



Australian Government



## ***Earth Quest* Exhibit Themes, Descriptions and Curriculum Links**

Questacon's *Earth Quest—Outer Space to Inner Earth* is a touring hands-on exhibition which is suitable for visitors aged 8 years and older. This document lists *Earth Quest* exhibit names, descriptions, key themes and subject areas as well as how *Earth Quest* links to the Australian National Curriculum.

*Earth Quest's* 30 exhibits escort visitors on a voyage from the outer limits of the Milky Way galaxy to the very centre of the planet Earth. It explores themes of astronomy, geology, geography, environmental science and biology.

The following suggestions and questions are useful for strengthening the educational experience for students and encouraging them to connect exhibit concepts to what they encounter in their everyday lives.

- Why do we have seasons? Do all countries on Earth experience the same four distinct seasons?
- How did mountains form over time? What's our closest mountain?
- How have animals adapted to life in different climates?
- How do scientists know what's at the centre of the Earth when we can't dig deeper than 12 kilometres below ground?
- Is it possible to show both the scale of planet size and the distance between planets at the same time?
- What cloud types did you notice this morning? Were they similar to any of the cloud descriptions on the panel, or something different?
- As you travel higher into the sky, what happens to the air pressure? Do you experience much air pressure standing here on the Earth's surface?
- Are the tallest and deepest features on the land or under the oceans?
- Why do some unrelated animals look similar?
- How does stress within rocks cause an earthquake?

<b>Earth Quest Exhibit Name</b>	<b>Exhibit Description</b>	<b>Key Themes</b>	<b>Subject Areas</b>
Air Pressure	Use the button and hand pump to remove air from the glass dome and watch how the rubber sheet rises because it is not being pressed down upon by air. The rubber sheet represents how the air pressure drops as you go higher up into the atmosphere.	atmosphere, air, pressure, altitude	Physics – air pressure & fluid mechanics (hydraulics & aerodynamics) Earth science – atmosphere & meteorology (weather)
Core Samples	Lift each knob to look at the model core samples (not to scale). Many clues about Earth's history are held deep underground. Scientists drill out long plugs of earth called core samples and study their mineral content, gas levels, fossils, microorganisms and plant materials.	geology, archaeology, core samples, climate change, gas, fossils	Earth science – palaeontology (fossils & dinosaurs) Earth science – geology (volcanoes, earthquakes, erosion & rocks)
Deep Sea Glow	Look through the eyepiece at pictures of deep ocean animals that live at ocean depths where sunlight is absorbed to create completely dark environments. Rotate the disc to see other animals with adaptations required to live at these ocean depths.	biology, animals, adaptations, oceans, deep ocean, fish, prey, predator, hunting, camouflage	Biology – animals (physiology, anatomy & adaptations) Biology – evolution & classification
Dig a Hole	Move a pointer to any place on the globe and imagine digging through to the other side of the world and the distances, temperatures and rock types that you would pass through.	geology, sub surface, Earth, human activity, mining	Earth science – geology (volcanoes, earthquakes, erosion & rocks)
Earthquake	Hold the frame up to the light. Push in the lever and watch colours within the frame. The colours show stress, similar to stress between tectonic plates rubbing against each other, causing inter plate earthquakes.	geology, earthquakes, force, tectonic	Earth science – geology (volcanoes, earthquakes, erosion & rocks)
Evolution	Match up columns of animals and note their specialised adaptations that help them move through mid-air, underwater or underground. When different animals develop similar features over many millions of years, this is called convergent evolution.	biology, evolution, adaptations, environment, convergent	Biology – animals (physiology, anatomy & adaptations) Biology – evolution & classification

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Exploring Earth	Tap each globe and listen carefully. Look at the base of each globe to check what is inside. Scientists can explore what is inside the Earth by studying vibrations—similar to the different vibrations in the metal globes.	geology, sub surface, Earth, magma, rocks, properties, seismology	Earth science – geology (volcanoes, earthquakes, erosion & rocks)
Food Pyramids	Insert the eight corn pieces into the slots and balance the mice and snake pieces on top. Animals that eat each other are linked together in a food chain or food pyramid.	biology, animals, predator, prey, food web, food chain, food pyramid, biomass	Biology – ecology (plant & animal populations, food webs)
Fossils	Pull out each drawer (representing an earth layer) and check the index fossil inside. Fossils of plants and animals that are known to have lived for certain periods of time are called index fossils. When these index fossils are found in a layer of earth, (anywhere in the world) they are used to judge the age of the layer in which they are found.	geology, archaeology, fossils	Earth science – palaeontology (fossils & dinosaurs)  Earth science – geology (volcanoes, earthquakes, erosion & rocks)
Galaxy Gaze	Peer through model telescopes to view images of features within the Milky Way Galaxy.	astronomy, planets, solar system, milky way	Physics – astronomy (space)
Hidden Depths	Move the mountain and trench up to the sea level to check the scaled height of different mountains and trenches located on Earth. Earth's deepest trench and tallest mountain are actually found underwater and not on land.	geology, mountains, landforms, geography, trench, oceans, measurement	Earth science – geology (volcanoes, earthquakes, erosion & rocks)
How Deep	Push down the knob and watch sliding markers stop at the deepest recorded point for mountains, trenches and human and animal activity.	geology, geography, landforms, mountains, oceans	Earth science – geology (volcanoes, earthquakes, erosion & rocks)
Landscape Journey	Move the toy car around the Australian map. Check the window for pictures of alpine, rainforest, wetland, desert and coastal environments where the car has stopped.	biology, ecosystems, environments, landforms, geography	Biology – ecology (plant & animal populations, food webs)

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Living Cells	Look into the eyepiece. Move the turntable around to see pictures of plant, animal and single-celled specimens as they would appear under a real microscope.	biology, human, physiology, cells, unicellular, microscope, organs, body systems	Biology – plants (physiology, anatomy & adaptations)
Making Mountains	Push the blocks towards each other. Watch what happens to the blocks, which represent tectonic plates or the Earth's crust. The blocks represent how some mountain ranges are formed by colliding tectonic plates.	geology, mountains, tectonic plates, landforms, geography	Earth science – geology (volcanoes, earthquakes, erosion & rocks)
Ozone	Read the quiz questions about ozone and place a ball against the response that you think is correct. Check your answers when the balls fall through or stay in place. Ozone gas is mostly found 20 kilometres above Earth's surface, where it prevents too much ultraviolet radiation (UV) from reaching the Earth's surface.	atmosphere, air, ozone, gases	Earth science – atmosphere & meteorology (weather)
Plants in Place	Insert the plant tokens into the matching landscape pots then pull a bar to check your plant quiz answers. Plants have very slowly evolved over millions of years with adaptations that allow them to survive in very dry, wet, hot, cold, windy or shady environments.	biology, plants, adaptations, ecosystem, environment, habitat	Biology – plants (physiology, anatomy & adaptations) Biology – ecology (plant & animal populations, food webs)
Seasons in a Spin	Move a model of planet Earth (tilted on its axis) in orbit around the Sun and notice how Earth's tilt would create different angles of incidence as sunlight hits the ground.	astronomy, Seasons, earth, light, Sun, orbit	Physics – astronomy (space)
Size of Planets	Compare scaled images of each planet in the Solar System. Even at this tabletop scale, the Sun is too large to show, indicating how massive the Sun is in real scale. Also, it's not possible to use the same scale to show both the size of planets and the distance between those planets in a way that would allow you to model the Solar System.	astronomy, planets, solar system, size, scale	Physics – astronomy (space)

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Solar System	Move each planet around the Sun and check the red lines (indicating Earth months) and white lines (indicating Earth years) to find out how long it takes each planet to orbit the Sun. It takes Mercury about 88 Earth days to completely orbit the Sun, while Neptune takes 165 Earth years and Pluto takes about 248 Earth years to orbit the Sun.	astronomy, orbit, Solar System, time	Physics – astronomy (space)
Spinning Sun	Spin the wheel and watch what happens to the model Sun. When the 'Sun ball' spins, its slight outward bulge is similar to the bulge of 1 to 6 kilometres at the Sun's equator, which also flattens the Sun's shape slightly.	astronomy, Sun, spinning, force, centrifugal force, astronomy	Physics – astronomy (space)
Surface to Core	Flip over each layer of Earth's sub-surface (layers are not to scale). Check layer thickness (km) and approximate temperatures (°C). Different layers of the Earth may be solid or liquid.	geology, sub surface, Earth, magma, rocks,	Earth science – geology (volcanoes, earthquakes, erosion & rocks)
Swirled World	Spin the sphere slowly, then quickly and compare different patterns in the fluid. As you spin the sphere, friction causes the fluid to drag as it flows. This causes the fluid to move in a turbulent and chaotic way.	Earth, atmosphere, weather, meteorology, friction, chaos, fluid, patterns	Earth science – atmosphere & meteorology (weather)
Tectonic Plates	Place the tectonic plate pieces together to create a map of the world. Earth's tectonic plates join together like a three-dimensional jigsaw puzzle, with most 'joins' between plates fitting together on the ocean floor.	geology, tectonic plates, magma	Earth science – geology (volcanoes, earthquakes, erosion & rocks)
The Air Up There	Lift each 'atmosphere layer' on the model Earth and look at the layers and the graphic panel to check what can be found in that layer. The Earth's atmosphere allows life to survive, because it circulates the air we breathe, protects Earth from ultraviolet radiation and helps to keep the Earth warm as it moves through sub zero space temperatures.	Earth, atmosphere, sky, gases, ozone, human activity, weather	Earth science – atmosphere & meteorology (weather)

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Turn the Tides	Spin the Earth picture to move the Moon in orbit around Earth and observe what happens to the tide images on each side of the Earth. Tides are mostly caused by the Moon as it orbits the Earth, although the Sun also influences tides on Earth to a small degree.	astronomy, Earth, Moon, tides	Physics – astronomy (space) Earth science – atmosphere & meteorology (weather)
Urban Jungle	Look for six animals in the suburban scene. See if you can find the same six animals in the bush scene. When humans build houses and roads over grasslands and forests, plants and animals must adapt and find other places called niches to live.	biology, animals, adaptations, habitat, ecosystem, built environment, habitat	Biology – animals (physiology, anatomy & adaptations)
Volcanoes	Move the knob and watch how simulated strips of 'lava' build a mountain. Some mountains form when lava flows out from volcanic vents. When lava is stored deep underground, it is called magma. Once the magma travels up and out through a volcano's vent, it is called lava.	geology, volcanoes, lava, magma	Earth science – geology (volcanoes, earthquakes, erosion & rocks)
What Weather	Look at the cloud photographs, think about the weather each cloud may bring and place a ball in a spot that represents clothing best suited to your weather forecast.	atmosphere, weather, forecast, clouds, meteorology	Earth science – atmosphere & meteorology (weather)
What's In the Air	Complete the puzzle using pieces that proportionately represent gases in Earth's atmosphere. What is the most common gas found in air?	atmosphere, air, gases, environment	Earth science – atmosphere & meteorology (weather)

## **Australian Curriculum Links**

*Earth Quest* exhibits link to the Australian National Science Curriculum (particularly Science Inquiry Skills across all school years). Core links indicate content that is directly covered within the exhibition, while optional links indicate content that is dependent on how people use and facilitate various exhibits.

### **Foundation core link**

Earth and space sciences (ACSSU004) Daily and seasonal changes in our environment, including the weather, affect everyday life

### **Foundation optional link**

Nature and development of science (ACSHE013) Science involves exploring and observing the world using the senses

### **Year 1 core links**

Biological sciences (ACSSU017) Living things have a variety of external features

Earth and space sciences (ACSSU019) Observable changes occur in the sky and landscape

### **Year 1 optional link**

Use and influence of science (ACSHE022) People use science in their daily lives, including when caring for their environment and living things

### **Year 2 core link**

Physical sciences (ACSSU033) A push or pull affects how an object moves or changes shape

### **Year 2 optional link**

Use and influence of science (ACSHE035) People use science in their daily lives, including when caring for their environment and living things

### **Year 3 core links**

Biological sciences (ACSSU044) Living things can be grouped on the basis of observable features and can be distinguished from non-living things

Earth and space sciences (ACSSU048) Earth's rotation on its axis causes regular changes, including night and day

### **Year 3 optional link**

Use and influence of science (ACSHE051) Science knowledge helps people to understand the effect of their actions

### **Year 4 core links**

Biological sciences (ACSSU073) Living things, including plants and animals, depend on each other and the environment to survive

Earth and space sciences (ACSSU075) Earth's surface changes over time as a result of natural processes and human activity  
Nature and development of science (ACSHE061) Science involves making predictions and describing patterns and relationships

#### **Year 4 optional link**

Use and influence of science (ACHSE062) Science knowledge helps people to understand the effect of their actions

#### **Year 5 core links**

Biological sciences (ACSSU043) Living things have structural features and adaptations that help them to survive in their environment

Chemical sciences (ACSSU077) Solids, liquids and gases have different observable properties and behave in different ways

Earth and space sciences (ACSSU078) The Earth is part of a system of planets orbiting around a star (the Sun)

#### **Year 5 optional link**

Use and influence of science (ACSHE217) Scientific knowledge is used to inform personal and community decisions

#### **Year 6 core links**

Biological sciences (ACSSU094) The growth and survival of living things are affected by the physical conditions of their environment

Earth and space sciences (ACSSU096) Sudden geological changes or extreme weather conditions can affect Earth's surface

#### **Year 6 optional link**

Use and influence of science (ACSHE220) Scientific knowledge is used to inform personal and community decisions

#### **Year 7 core links**

Biological sciences (ACSSU111) There are differences within and between groups of organisms; classification helps organise this diversity

Biological sciences (ACSSU112) Interactions between organisms can be described in terms of food chains and food webs; human activity can affect these interactions

Earth and space sciences (ACSSU115) Predictable phenomena on Earth, including seasons and eclipses, are caused by the relative positions of the Sun, Earth and the Moon

#### **Year 8 core links**

Biological sciences (ACSSU149) Cells are the basic units of living things and have specialised structures and functions

Biological sciences (ACSSU150) Multi-cellular organisms contain systems of organs that carry out specialised functions that enable them to survive and reproduce

Earth and space sciences (ACSSU153) Sedimentary, igneous and metamorphic rocks contain minerals and are formed by processes that occur within Earth over a variety of timescales

### **Year 9 core links**

Biological sciences (ACSSU175) Multi-cellular organisms rely on coordinated and interdependent internal systems to respond to changes to their environment

Earth and space sciences (ACSSU180) The theory of plate tectonics explains global patterns of geological activity and continental movement

### **Year 10 core links**

Biological sciences (ACSSU185) The theory of evolution by natural selection explains the diversity of living things and is supported by a range of scientific evidence

Earth and space sciences (ACSSU188) The universe contains features including galaxies, stars and solar systems and the Big Bang theory can be used to explain the origin of the universe

### **Year 10 optional link**

Earth and space sciences (ACSSU189) Global systems, including the carbon cycle, rely on interactions involving the biosphere, lithosphere, hydrosphere and atmosphere