Explore your World

Exhibition Guide

CREATED BY

scitech

PERTH • AUSTRALIA

Contents

Exhibition Overview

Undertake a quest across land, sea, and space to explore the role of mapping and navigation in everyday life. Visitors will find the seven 'quest' stations to solve puzzles and collect different parts of their own map, which can then be viewed and brought to life through augmented reality.

Maps are created using layers of data to help us understand the world around us and guide how we interact with it. Mapping and navigation has been at the heart of the human experience since the dawn of our species, underpinning advancements in science, technology, engineering, and mathematics (STEM) over millennia.

In Explore Your World visitors will use different navigational tools and techniques to find their way through dangerous reefs and shipwrecks, escape a virtual building in an emergency, and pilot a simulated underwater exploration vehicle. They can operate a real sonar scanner to map themselves and their friends, or take on the challenge of a giant game of Battleships.

Visitors have the chance to explore the intricate global ocean currents using real-world scientific modelling by tracking the movement of debris from a spilled cargo container full of rubber ducks. Using the oldest navigational techniques known to humankind, visitors will learn to use the stars to find their way across both land and ocean, just as our ancestors did tens of thousands of years ago.

Throughout Explore Your World visitors will be captivated and surprised in the quest to explore cities, oceans, and the night sky, and develop their own mapping skills as they complete the quest map and uncover hidden layers of information.

Visitor Appeal

Explore Your World has been developed to engage children aged between 5 - 12 years and their families, although the exhibition provides a broader appeal to fascinate and inform people of all ages.

Exhibits within Explore Your World offer activities for all ages, with younger visitors using 3D printed buildings to recreate a town using images taken from different perspectives, learning to navigate using nothing but the human body and the stars, or creating their own life-sized contour maps from foam blocks. Older visitors will enjoy entering virtual worlds to escape a building in an emergency, or mapping the ocean floor using a remotely piloted underwater vehicle.

Families and friends can work together to navigate a virtual boat through reefs and islands, and use mapping coordinates to challenge each other to a giant game of Battleships.

All visitors will enjoy exploring different approaches to exploring their world, and to develop mapping skills through drawing and building their own map as part of the quest that links the exhibits together.

Key Messages

- The human need to understand and explore our world drives developments in science and technology
- Mathematics provides the language and framework to map our surroundings
- Maps are comprised of layers of data that help us to visualise the world and how it works
- There are many useful and inspiring careers involving mapping, navigation, and data visualisation

Science Links

- Geography and Geology
- Topography and Cartography
- Astronomy and Space Science
- Physics
- Mathematics and Spatial Science
- Acoustics
- Communications Technology
- Meteorology and Climate Science

Exhibits

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1. Escape the Building

Maps don't just help us find buildings, we also use them to navigate inside buildings. Building plans are an important type of map we use for navigation and safety. *Can you memorise a map to escape a virtual building in an emergency?*

Science Links: Topography and Cartography, Mathematics and Spatial Science

2. Battleship

Coordinates describe locations using system of numbers, letters, or symbols that help us to describe a location to someone else. *Challenge a friend to a giant game of Battleships using coordinates.*

Science Links: Mathematics and Spatial Science

3. GPS

The Global Positioning System (GPS) can tell us where we are, and while most of us have probably used a GPS device in a car or on our cell phone, the information is coming from satellites up in space. *Visitors can match up GPS markers to locate places on Earth using triangulation.*

Science Links: Astronomy and Space Science, Physics, Mathematics and Spatial Science, Communications Technology

4. Ocean Explorer

We have mapped deserts, mountains, stars, and even other planets, but we still don't have a detailed map of the world's seafloors. Developments in autonomous vehicles and sensor technology allows us to explore under the oceans. *Pilot a virtual underwater robotic vehicle to map the ocean.*

Science Links: Geography and Geology, Topography and Cartography, Communications Technology, Accoustics

5. Compasses

Compasses use the Earth's magnetic field to show us the direction of the North Magnetic Pole but are also influenced by other magnetic fields, both artificial and naturally occurring. *Explore how magnetic fields affect the direction of a compass.*

Science Links: Geography and Geology, Physics

6. Bearings

Bearings describe a direction facing away from a given position. To navigate between places, we need to know both directions and distances. *Visitors can follow a series of bearings to find a location.*

Science Links: Geography and Geology, Topography and Cartography, Mathematics and Spatial Science

7. Build Your Town

Whether you're a tourist in an unfamiliar town or visiting a large shopping mall, maps can help you find where to go, but maps don't always match exactly what we see. *Try to recreate a town using images from different perspectives*

Science Links: Geography and Geology, Topography and Cartography, Mathematics and Spatial Science


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8. Layers of Data

Maps can show information that changes over time, such as weather or traffic congestion. Showing information as layers on a map allows us to visualize how it relates to the physical world around us. *Visitors can investigate global data sets such as ocean currents or wind patterns.*

Science Links: Geography and Geology, Topography and Cartography, Astronomy and Space Science, Meteorology and Climate Science

9. Real Size

The earth is (almost) a sphere and trying to show it on a flat map always involves some amount of squashing, stretching, or tearing, like trying to flatten an orange peel. The way the Earth is flattened onto a map is called a map projection. *Move countries around on screen to compare their true size.*

Science Links: Geography and Geology, Topography and Cartography, Mathematics and Spatial Science

10. Navigation Hazards

The ocean has many hazards through which boats must navigate around to avoid damage. Developments in technology allow us to locate hazards and communicate them to others. *Guide a friend through the ocean, avoiding hazards.*

Science Links: Geography and Geology, Topography and Cartography, Mathematics and Spatial Science, Communications Technology

11. Celestial Navigation

People have been using the stars to find their way for millennia. *Use the stars and your own body, to measure angles find bearings to navigate by.*

Science Links: Astronomy and Space Science, Physics, Mathematics and Spatial Science

12. Satellite Stitching

Satellites take images in long, thin strips. People and computers work together to match these overlapping images to gradually build up a whole picture of the Earth. *Match the strips of satellite imagery to build a map.*

Science Links: Geography and Geology, Topography and Cartography, Astronomy and Space Science, Mathematics and Spatial Science

13. Sonar Scan

Sonar uses reflected sound to measures distance. measure the depth of the ocean or to find objects in it. Sonar technology helps us to map the ocean floor and locate objects within the ocean. *Build and map different objects, and yourself, using a scanner!*

Science Links: Physics, Mathematics and Spatial Science, Communications Technology, Acoustics

14. Stackable Contours

Contours are lines that trace a constant value, such as height, air pressure, or temperature. Contour lines on 2D maps can show us what shape a hill might be; the slope will be steeper when the lines are closer together. *Stack up foam shapes to make a contour map.*

Science Links: Geography and Geology, Topography and Cartography, Mathematics and Spatial Science

15. Track the Ducks

In 1992 a container fell off a cargo ship and spilled 28,000 rubber ducks into the ocean. This accident allowed scientists to map ocean currents by tracking where the ducks ended up. Recreate this experiment by dropping ducks in other places around the world. *Follow the currents by tracking the movements of the ducks. Can you spot any ducks hidden around some of the other exhibits?*

Science Links: Geography and Geology, Topography and Cartography, Mathematics and Spatial Science, Meteorology and Climate Science

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16. Map Projection

Showing a 3-dimensional Earth on a 2-dimensional map accurately is tricky, but there are different ways to make it appear less distorted. Cartographers use maths to find different ways to flatten the Earth. *Assemble a 3D globe or 2D projection on a magnetic wall and icosahedron.*

Science Links: Geography and Geology, Topography and Cartography, Mathematics and Spatial Science

17. Match the Contours

Topographical maps use contours to show features of the landscape. Hills and valleys are represented by differently spaced lines and shades of color. *Match the hill or valley profile to the contour map.*

Science Links: Geography and Geology, Topography and Cartography, Mathematics and Spatial Science

18. AR Sandbox

Changes in elevation are hard to show on a 2D map, but by experimenting with colour and contour lines we can accurately describe different types of land. *Visitors can create elevations in a sandbox and see projected contours.*

Science Links: Geography and Geology, Topography and Cartography, Mathematics and Spatial Science, Physics

19.Map Checker

As visitors move through the exhibition they will complete a series of 7 quests, unearthing layers of information and populating their very own map. *A completed map can be viewed through the map checker, bringing it to life in 3D using augmented reality.*

Science Links: Geography and Geology, Topography and Cartography, Mathematics and Spatial Science

Educational Resources

Explore Your World is accompanied by a School and Visitor Guide to assist teachers and family groups visiting the exhibition.

The exhibition covers the following areas of science:

- Geography and Geology
- Topography and Cartography
- Astronomy and Space Science
- Physics
- Mathematics and Spatial Science
- Communications Technology
- Acoustics

Scitech will provide each venue with a sample program to run with visiting schools. Venues are free to use and modify this material to suit the curriculum in their area or the target audience, providing due acknowledgment is made of Scitech as the producer of the exhibition.

Marketing

***Explore Your World* has been designed specifically for children aged between 5 and 12 years old although the subject material and exhibit content will have broad appeal for both younger and older audiences.**

Scitech will provide the following marketing materials to help each venue promote the exhibition:

- Exhibition photos and video
- Exhibition logos
- Examples of advertising and promotional artwork
- Example of media release

Explore Your World will tour to other venues free of any specific sponsorship agreements, enabling host venues to link with a wide range of sponsors in the local market.

Touring Arrangements

***Explore Your World* consists of 19 interactive exhibits with accompanying inbuilt, durable graphic panels that outline instructions for the visitor and relate interesting science facts in everyday terms.**

Space and height

- Fits an exhibition space of approximately 400 – 600 square metres (4,300 – 6,500 square feet) in flexible configurations
- Minimum ceiling height requirement for the exhibition is 3 metres (10 feet), although 4 metres (13 feet) is optimal
- Minimum entry and exit points for installation is 2.7 x 2.7 metres (9 x 9 feet)
- The exhibition will travel in two 40-foot sea containers, inclusive of spare parts and equipment

Power and air

- Exhibits are powered by a standard 120v/240v electricity supply and are designed to accept power from the ceiling or the floor
- Some exhibits require 24 hour power to prevent damage to the projectors

Fees

Negotiations with individual venues will be conducted to determine the appropriate fee structure for the exhibition period.

Training and maintenance

Scitech will provide the host venue's exhibition and visitor staff with a full briefing on exhibit operation and maintenance, as part of the exhibition installation. The exhibition does require some simple maintenance which needs to be carried out on a daily basis. A full list will be provided in the exhibition manual.

Scitech will provide:

- The exhibition as outlined in the Contract
- Transit insurance
- An exhibition supervisor to coordinate the installation and dismantling of the exhibition
- Replacement parts through normal wear and tear
- Education and marketing material

The host venue will provide:

- A team to assist the installation and dismantling of the exhibition
- Replacement exhibit consumables as required
- 24 hour physical and/or electronic security of the exhibition
- Any special requirements (scaffolding, forklifts, trolleys etc.) specified in the Contract

Contact Details

Jason Poletti	
Program Manager, Travelling Exhibitions	
Email:	jasonp@scitech.org.au

Scitech	
Email:	exhibitions@scitech.org.au
Web:	scitech.org.au/support/hire-an-exhibition/

Information contained in this guide was correct at the time of publication.

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www.scitech.org.au/exhibition-rental