Lost in Space

Band level: Years 5 to 6 (Beginner level activities)

Description: Students will explore the Solar System using Augmented Reality and the Merge Cube. This lesson is a deeper look into the Galactic Explorer section of the Merge Explorer app. Here students can explore the solar system and learn about the astronomical objects

Resources:

- iPad, (no internet required)
- Merge cubes
- Mega Merge Cube (optional)
- MERGE Explorer app
- Worksheet

Prior Student Learning: Merge Cube Magic lesson

What is Augmented Reality? Augmented reality is using technology to superimpose information such as sounds, images and text onto real world objects that we see. It works by adding the digital content onto a live camera feed, making that digital content look as if it is part of the physical world. This could be anything from making your face look like a dinosaur to overlaying digital directions onto the physical streets around you.

What is a Merge Cube? The Merge Cube is a spongy, dense black foam cube with silver markings on all six sides in patterns similar to QR codes. The patterns provide an Augmented Reality trigger that launches when any of the Merge apps are pointed at the cube. It provides a powerful interactive experience in a real world environment where an object (the cube) is enhanced by a 3D digital-generated image that comes to life by using the camera on a digital device.

What is the Merge Explorer App? With the MERGE Explorer app students will learn about topics such as earth science, life cycles, the solar system, anatomy, properties of matter, weather and climate, ecosystems and more. The app provides students with an interactive experience in which digital images, sounds and text can be seen on the Merge Cube. Students can investigate a volcano, examine inside the human body, and hold the earth in the palm of their hands. They can even dissect a frog (humanely)!

Curriculum Links:

Band/Year Level	**Digital Technologies Achievement Standard** By the end of Year 6, students explain the fundamentals of digital system components (hardware, software and networks) and how digital systems are connected to form networks. Students define problems in terms of data and functional requirements and design solutions by developing algorithms to address the problems.
5 to 6	
	Content Descriptions: **Digital Technologies: Knowledge and Understanding** Examine the main components of common digital systems and how they may connect together to form networks to transmit data (ACTDIK014) **Digital Technologies: Process and Production skills** Define problems in terms of data and functional requirements drawing on previously solved problems (ACTDIP017)
Year 5	**Science Achievement Standard** By the end of Year 5, students … describe the key features of our solar system.
	Content Descriptions: **Science Understanding:** The Earth is part of a system of planets orbiting around a star (the sun) (ACSSU078)
Level 4	**General Capabilities** ICT Capabilities ● Locate, generate and access data and information ● Select and use hardware and software ● Understand ICT systems Critical and creative thinking ● Locate, generate and access data and information ● Imagine possibilities and connect ideas

Whole class activity: Explore Phase

The teacher introduces the students to the Solar System through Augmented Reality and using the Galactic Explorer section of the MERGE Explorer app (see Attachment A). Explain how the AR happens through the camera of the device and superimposes the image onto the cube. This could be done using the Mega Cube for the whole class to see.

Group work activity: Play Phase

1. Divide the students into pairs or groups and provide an iPad and merge cube to each.
2. Open the Explorer app and navigate to the Galactic Explorer section.
3. Read through the topic card information.
4. Interact with each AR activity to explore, discover and learn.
5. Students should be able to answer the following questions.

Journey into Space **What can you find in the Solar System?** Students explore the **planets and moons in the solar system** while they hold and interact with each object, **clicking each one** to find out more. Describe the solar system.	***Moving in Circles*** **Do all the planets orbit the sun at the same speed?** Students investigate the **movement of the planets** orbiting the sun. The module will **visualize** the **plates** on the **Earth's Crust**. Let students time each planet's orbit around the sun and compare the data.
Moonscapes **Which planets have moons and how many?** Students learn about the **many moons** in the solar system and discover their movement in relation to the planets. They will hold and interact with each one observing their shape and rotation.	***Centre point*** **Which object is the source of light and heat?** Students learn the importance of **the sun**, and that is the source of **light** and **heat** across the solar system. They'll hold and describe the planets relative to the sun.

Galactic Explorer

Essential Questions

- How can we describe planets by their relative size?
- How can we predict the motion of planets, seasons, and other celestial events?
- Why does what we see in the night sky move and change?

Activity

1. You are standing on Earth, the third of eight planets floating in our solar system. Have you ever looked up at the night sky and thought about space? Why do you think some stars only appear during a particular season? Why do eclipses occur, and how do scientists predict them ahead of time? Today, we are going to explore our solar system and explore objects found there.

2. Using your Merge Cube, access the “Galactic Explorer” Topic Card inside Merge Explorer. Look at the image at the very top and read the introduction.

3. Start the activity to explore the planets that orbit the Sun. When you tap on a planet, you’ll see detailed information. What can you learn about each planet? Be sure to read each planet’s fun fact – you’ll find some really interesting information.

4. Look specifically at Earth as it orbits the Sun. Try to picture a single point on Earth – perhaps where you live. Is every planet visible to that side of Earth at the same time? Does it change based on the other planets orbits and the time of year?

5. As you look at the solar system model, think about the following questions:
   Do all planets orbit the sun at the same speed?
   How do the planets orbit the Sun?
   How do moons orbit their planet?
   When we stand on Earth and look up at the night sky, will we see every planet each night – or only some nights?

Assessment

1. Video Recording: Record a video answering this question - How is the motion of planets around the Sun and in our visible night sky predictable?

2. Class notebook: Answer the Essential Questions in your class notebook.