The Food Web Ecosystem – Food, Food, Food

Band level: Year 6 and Year 7

Description: Students will explore how plants and animals are interconnected with Augmented Reality and the Merge Cube. This lesson is a science simulation for a deeper look into the **Food Web** section of the **Merge Explorer** app. Here students can explore how energy is exchanged in an ecosystem and the role of producers, consumers and decomposes in a food chain.

Resources:

- iPad, (no internet required)
- Merge cubes
- Mega Merge Cube (optional)
- MERGE Explorer app – **The Food Web**
- Worksheet – **The Food Web**

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:

Year 5 to 6	**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.
	Content Descriptions: Examine the main components of common digital systems and how they may connect together to form networks to transmit data (ACTDIK014)
Year 7 to 8	**Digital Technologies Achievement Standard** By the end of Year 8, students distinguish between different types of networks and defined purposes. They plan and manage digital projects to create interactive information.
	Content Descriptions: Investigate how data is transmitted and secured in wired, wireless and mobile networks, and how the specifications affect performance (ACTDIK023) Acquire data from a range of sources and evaluate authenticity, accuracy and timeliness (ACTDIP025)
Year 6	**Science Achievement Standard** By the end of Year 6, students … describe and predict the effect of environmental changes on individual living things.
	Content Descriptions: Science Understanding: The growth and survival of living things are affected by physical condition of their environment (ACSSU094)
Year 7	**Science Achievement Standard** By the end of Year 7, students … predict the effect of human and environmental changes on interactions between organisms and classify and organise diverse organisms based on observable differences.
	Content Descriptions: Science Understanding: Interactions between organisms, including the effects of human activities can be represented by food chains and food webs. (ACSSU112)

Whole class activity: Explore Phase

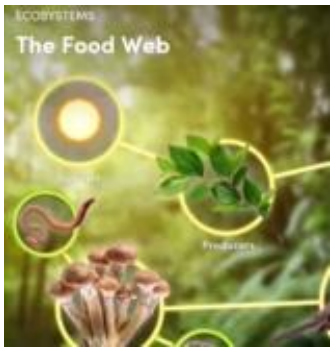
The teacher introduces the students to how plants and animals are interconnected in a food chain through Augmented Reality and using the **Food Web** section of the MERGE Explorer app (see Attachment A). Explain how the AR happens through the camera of the device and superimposes the image onto the cube. 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 **Food Web** 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.

Healthy Producers **What makes the healthiest plants?** Students explore through a **visual simulation** elements required for plants to grow. These are the **producers**. Tap each button to find the three **key components** for the **healthiest** looking plant. Which combination creates the healthiest looking plant?	***Primary Consumers*** **What is a primary consumer?** Take a closer look at **consumers** – organisms that eat to get their **energy**. The caterpillar is eating a leaf (**the producer**). Organisms that eat producers are called **primary consumers**. This activity highlights the feeding relationship between animals known as a **food chain**. Food chains show how **energy flows between organisms**.
Secondary Consumers **What is a secondary consumer?** The next **simulation** shows the feeding relationship **between organisms** in a **food chain**. Press play and watch the **interaction** between the leaf, the caterpillar, and the sparrow. What is the bird's role in the food chain? What makes the bird a secondary consumer? How is energy passed through the food chain?	***The Food Cycle*** **What is decomposing matter?** **Decomposers** are important in the food chain. When a consumer or producer dies, decomposers help **break down the organic material**, and turn it into **nutrients** that then help new producers grow. See how the dead bird goes from **fresh to decomposed**. What do you notice at the beginning? Slowly move to "decomposed". What appears?

Attachment A



The Food Web

Essential Questions

- How do our bodies get energy?
- How do producers produce energy?
- How is energy passed through the food web?

Activity:

1. How does your body get energy? Your body cannot make its own energy. When you eat, your body breaks down your food into small parts and then uses some of those parts to make energy that your cells can use to do all the important work that they do. Where does all energy ultimately come from? What types of organisms are producers? What things do you think a plant needs to grow?

2. Using your Merge Cube, access "The Food Web" Topic Card inside Merge Explorer. In **Activity One** explore different things to see which combination creates the healthiest looking plant. The four buttons represent sunlight, water, soda, and nutrients. Turn on each individually and see what happens. Does the plant improve, get worse, or stay the same? Does the plant look healthy or unhealthy? Once you have looked at each element individually, start trying to find the best possible combination for the healthiest looking plant?

3. Now explore **Activity Two** and observe the scene. Notice that in this activity the caterpillar is labelled as the "Primary Consumer." A model that shows the feeding relationships between several organisms is a food chain. We can give consumers specific names depending on what they are eating and where we find them on a food chain. Organisms that eat producers on a food chain are called Primary Consumers.

4. Next read **Activity Three.** Based on the introduction, think about what the food chain would look like. In the introduction, it calls the bird (the sparrow) a secondary consumer. A secondary consumer is a consumer that eats a primary consumer. Press play and watch the interaction between the leaf, the caterpillar, and the sparrow. Draw a food web showing this interaction.

5. Go to **Activity Four**. What do you notice at the beginning when the slider is on "fresh"? What does the bird look like? Slowly move the slider to "decomposed". What do you notice? What happens to the bird? What appears? When living things die, their bodies break down. Decomposers are organisms that help breakdown living things that have died. Decomposers are an important part of the food chain. When a consumer or producer dies, decomposers help break down the organic material, and turn it into nutrients that then help producers grow.

Assessment:

Video Recording: Record a video verbally describing what is happening in the scene of Activity 3. Use the vocabulary words producer, primary consumer, and secondary consumer, and explain how energy flows between the organisms.

Class Notebook: Answer the Essential Questions in your science notebook.

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