

UNIT 12

THE WATER CYCLE

We can find water all around us.

Have you ever wondered why water on the Earth does not run out?

How will our lives be affected if there is too much or too little water on the Earth?

Let's Find Out:

- What is the water cycle?
- What is the impact of the water cycle on the Earth and living things?
- How do human activities affect the water cycle?

12.1

What Is the Water Cycle?

The **water cycle** is the continuous movement of water from the Earth, to the sky and back to the Earth. It involves changes in the state of water. There is a continuous supply of fresh water on the Earth due to the water cycle.



RESEARCH

Find out when water first existed on the Earth.



Sun

water changing
from a liquid to a
gas (evaporation)

Heat from the Sun causes water on the Earth's surface to **evaporate** into the air.

FLASHBACK

Recall from Textbook 4 Unit 5:
Water changes its state when it gains or loses heat.

water changing from
a gas to a liquid
(condensation)

cloud

Air that contains **water vapour** rises into the sky, where the temperature is lower. The water vapour cools and **condenses** into tiny droplets of water. As more water vapour condenses, droplets of water gather to form clouds.

Living things such as plants and animals give out water into the air in the form of water vapour.



LANGUAGE CONNECT

Imagine that you are a water droplet. Write three to five sentences to describe how you felt as you went through the water cycle.

water returning
to the Earth



Activity Book

- ▶ Activity 1, pages 113–114
- ▶ Activity 2, pages 115–116
- ▶ Activity 3, page 118

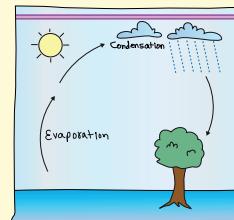
When the water droplets in the clouds become too big and heavy, they fall back onto the Earth as rain. When the weather is very cold, water can also fall from the sky as snow or hailstones.

Water that returns to the Earth seeps into the ground, or is stored in water bodies such as rivers, lakes and seas. The water cycle repeats itself when this water evaporates.



CREATIVE SCIENCE

Make a model of the water cycle!



Activity Book

- ▶ Creative Science, page 117

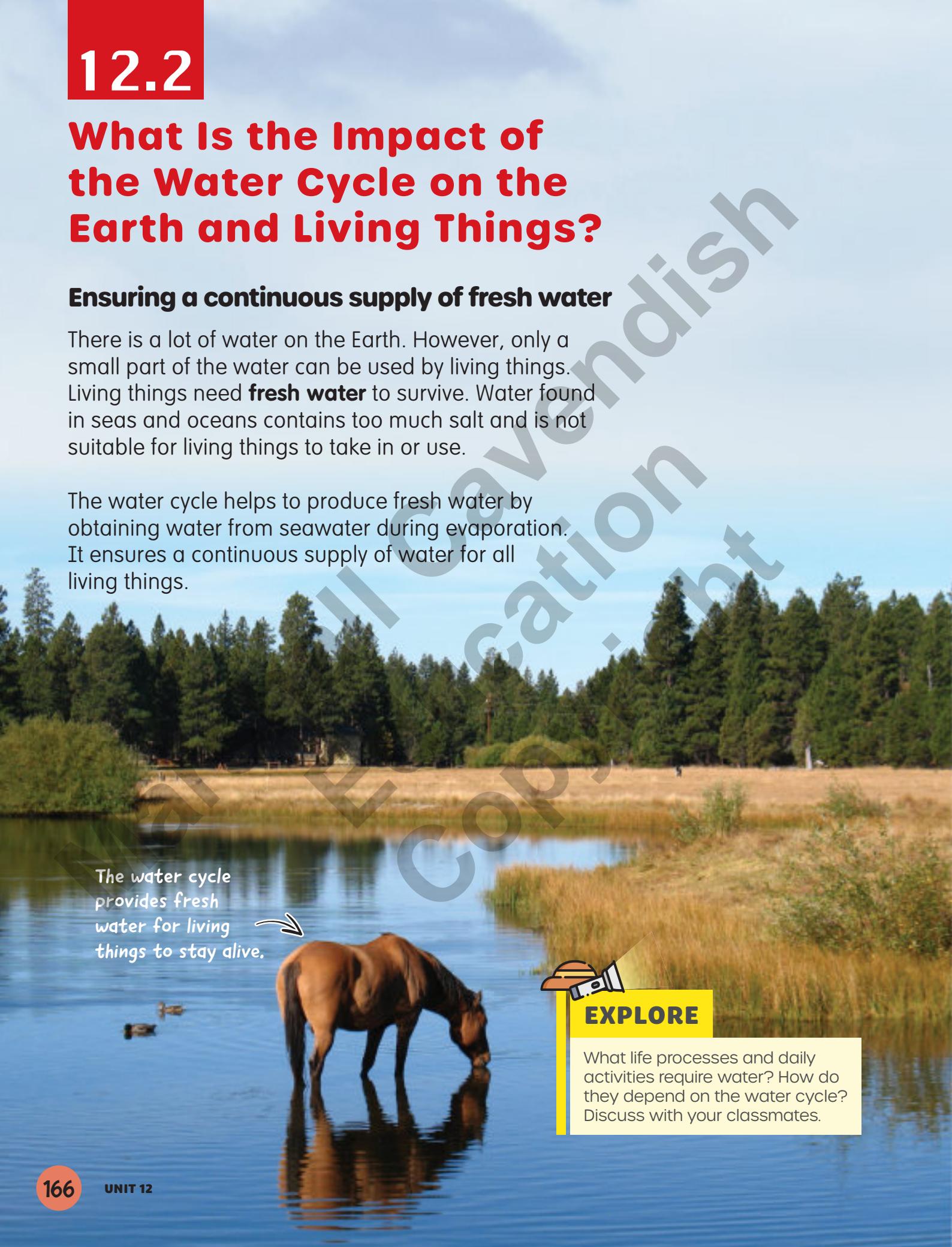
12.2

What Is the Impact of the Water Cycle on the Earth and Living Things?

Ensuring a continuous supply of fresh water

There is a lot of water on the Earth. However, only a small part of the water can be used by living things. Living things need **fresh water** to survive. Water found in seas and oceans contains too much salt and is not suitable for living things to take in or use.

The water cycle helps to produce fresh water by obtaining water from seawater during evaporation. It ensures a continuous supply of water for all living things.



The water cycle provides fresh water for living things to stay alive.

EXPLORE

What life processes and daily activities require water? How do they depend on the water cycle? Discuss with your classmates.

Cooling the air on the Earth

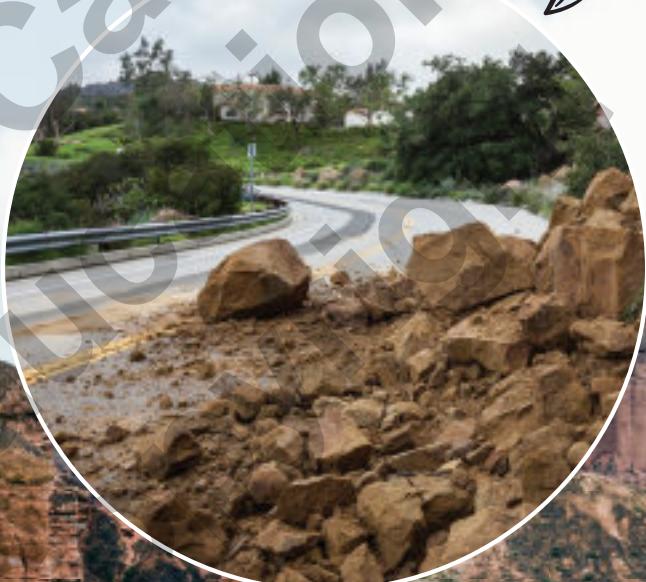
The water cycle helps to cool the air on the Earth. Rain that falls from the sky has a lower temperature than the air around us. As a result, heat flows from the air to the rainwater, causing the temperature of the air to decrease.

Shaping the Earth's surface

Water is one of the agents of change that shape the Earth's surface. Running water can change some of the natural structures on the Earth's surface by erosion. Erosion causes materials to break off and soil to be carried away. When a large amount of rain falls on land over a short period of time, **landslides** may occur.

Landslides caused by heavy rain result in changes in the Earth's surface.

The shapes of these rocks change over time due to erosion by running water.



QUICK CHECK

1. Which two processes result in the formation of clouds from water on the Earth?
2. How does the water cycle benefit living things?



Activity Book

Activity 4, page 119

12.3

How Do Human Activities Affect the Water Cycle?

The water cycle is affected by changes in the Earth's atmosphere, such as the amounts of water vapour and carbon dioxide in the air. Examples of human activities that can cause such changes are deforestation and burning of fossil fuels.

Deforestation

To obtain land for planting crops and development into towns, forests are cleared by cutting or burning down trees. This is called **deforestation**.

Trees are cut or burnt down during deforestation.



The removal of trees results in fewer trees, which give out less water vapour into the air. Thus, fewer clouds form and the amount of rain decreases.

Trees take in carbon dioxide during photosynthesis. Due to deforestation, there are fewer trees that take in carbon dioxide during photosynthesis. Thus, the amount of carbon dioxide in the air increases.