6.5 A desert ecosystem

Life is rather tough in a desert environment. Desert plants and animals face extremes of temperature, food shortages and a lack of readily available water. To survive, they have to adapt to these harsh conditions.

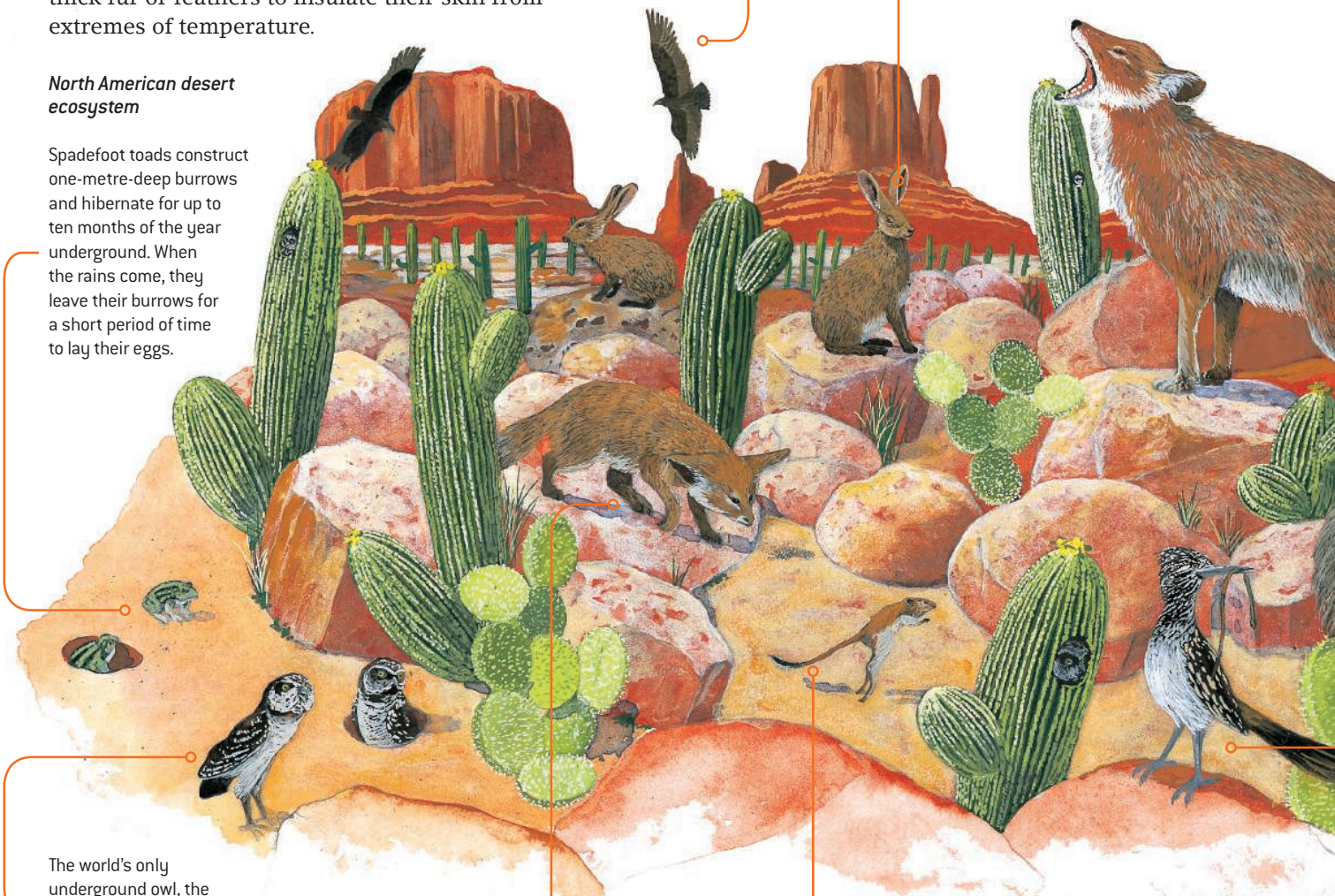
Animal survivors

The bodies of creatures in desert **ecosystems** have evolved to help them survive. Many are pale in colour, to reflect the heat. Some desert animals, such as reptiles, can vary their body temperature dramatically to cope with extremes of temperature. Some desert animals have very long legs to increase the distance between their bodies and the hot sand. Others have thick, leathery skins or hard, waxy shells to help them retain water, or thick fur or feathers to insulate their skin from extremes of temperature.

Staying cool

When it gets too hot, most desert birds look for shade. Some take off, to drift on the cool **thermals** that blow high above the hot sands. Many desert animals dig deep burrows into cooler sand, where they stay during the heat of the day, coming out to hunt at night. Desert storks and vultures urinate on their legs. The evaporating urine cools their skin,

North American desert ecosystem



Vultures escape the hot midday temperatures and save energy by soaring high in the cooler thermals of air. They urinate on their legs to allow evaporation to cool themselves down.

The jackrabbit has developed huge ears to draw heat away from its body. The blood vessels in the ears release heat when the animal is resting in a cool, shady location.

Spadefoot toads construct one-metre-deep burrows and hibernate for up to ten months of the year underground. When the rains come, they leave their burrows for a short period of time to lay their eggs.

The world's only underground owl, the burrowing owl, moves into empty burrows to avoid the daytime sun. To stay cool it opens its beak and rapidly flutters its throat to evaporate water from its mouth.

Kit foxes avoid the heat of the day. They are nocturnal, usually emerging from their dens shortly after sunset to hunt small animals, birds and lizards.

Kangaroo rats have the ability to convert the dry seeds they eat into water. They do not sweat, and they have special kidneys that allow them to dispose of waste materials with very little loss of water.

and the cooler blood then flows back into their body. Some creatures hop to minimise the contact of their feet with hot sand or, like lizards, run extremely fast.

Food and water supplies

Most large desert animals survive because they are **herbivores**. They obtain moisture from the plants they eat. Others, like scorpions, get their moisture from their prey or from dew. The camel stores food in its hump, and can go for days without drinking. The scarab beetle solves the problem of a scarce food and water supply by eating animal dung!

The coyote is one of the most adaptable animals in the world. It can change its breeding habits, diet and behaviour to survive in a wide variety of habitats. Its skill as a successful hunter for anything ensures this carnivore's success in the deserts of North America.

Saguaro cacti have no leaves. Their spiky thorns reduce the surface area exposed to the sun and the loss of water. When water is absorbed, the stem of the Saguaro cactus can expand to hold the moisture. This ability to store water allows it to flower every year, regardless of rainfall.

Peccaries have sharp teeth and a hardy digestive system that allows them to obtain moisture from prickly desert plants such as cacti. They are nocturnal and spend the heat of the day resting in hollows.

Chuckwallas are large, plump lizards that slide between rocks to avoid the desert sun and predators.

The roadrunner is a fast carnivorous ground bird. It obtains moisture and nutrition from a wide range of foods including insects, scorpions, lizards, snakes, rodents and other birds. The roadrunner reabsorbs water from its faeces before excreting.

Plant survivors

There are two main types of desert plants: **perennials** and ephemerals. Perennials are plants that have adapted ways to cope with desert conditions and ephemerals are those that have a very short life cycle after rain. Some desert perennials, such as America's mesquite tree or Australia's river redgum, have very long root systems, often stretching down to the watertable. Others, such as succulents, have shallow but widely spread root systems so they can soak up and store lots of water when it rains. Many perennials have small leaves, often waxy, to reduce loss of moisture through transpiration. Some have no leaves at all — just thorns and spikes. During dry periods, plants may drop their leaves, or parts of the plant above the surface may die.

ACTIVITIES

UNDERSTANDING

1. Why is survival a problem for plants and animals in a desert environment?
2. Explain the difference between perennial and ephemeral plants. Provide an example of how each type of plant survives in a desert.

THINKING AND APPLYING

3. Create an imaginary ideal desert animal that can survive in a desert ecosystem. Draw and label a sketch of this creature.

USING YOUR SKILLS

4. Copy and complete the following table in your notebook.

Special plant or animal feature	How it helps to ensure survival
Thorns instead of leaves	
Large ears	
Pale colouring	
Long legs	
Large roots	

GEOTERMS

ecosystem: a system formed by the interactions of the living organisms (plants, animals and humans) and physical elements of an environment