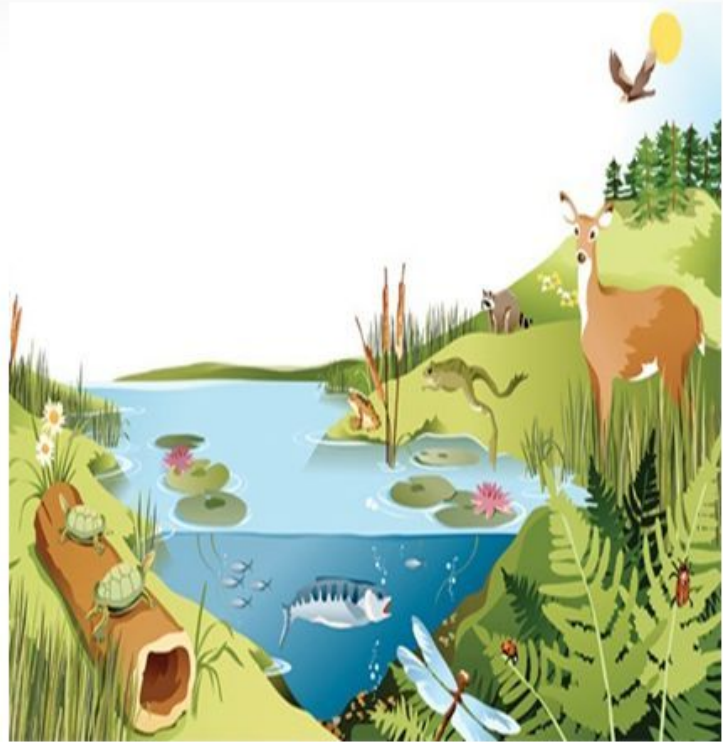


Unit - 4

4.1 - 4.2 Ecosystems

What is an ecosystem?

- An **ecosystem** is an area where organisms interact with one another as well as with the nonliving parts of the environment.
- An ecosystem can be huge, such as a large forest or lake, or it can be small, such as a puddle of water or a rotting log.



Types of Ecosystem with Examples

I: Natural: Terrestrial



Grassland



Forest



Desert

Natural: Aquatic

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a) Marine: Oceans



b) Freshwater: Lakes

II: Artificial or Manmade

Aquarium



Crop field



Desert ecosystem

(Sonoran desert in Arizona, USA)

- Not an easy place to live
- Not much rainfall
- Organisms survive through **adaptations**

Tall plants (saguaro cacti) grow very slowly

- Roots spread out widely underneath the soil in order to absorb more water from rain

Gila woodpeckers - make nests by making holes in cacti



Cactus wrens - make nests in a cactus (teddy bear cholla); too spiky to allow other animals
→ eggs easily protected from predators



Plants and animals interact with each other affecting each others lives

During hot days, animals rest under plant shades or soil burrows

At night, animals come out to feed (kangaroo rats come out to feed, wary of their predators - rattle snakes and coyotes)

When it rains, desert transforms as plants quickly produce flowers (insects feed on nectars, help in pollination; at night, bats feed on nectar from agave flowers; seeds fallen to ground collected by ants for making nests, uneaten seeds germinate after months or years)



Living organisms also interact with the non-living parts of the environment

Light - bright sunlight → photosynthesis → produce food → eaten by organisms

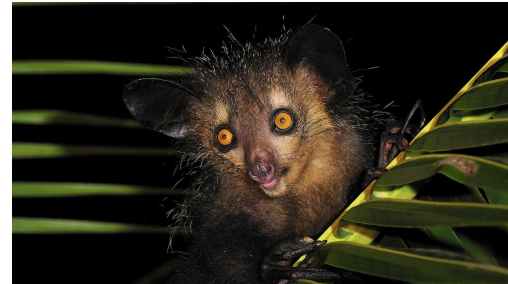
Temperature - very high during the day and much lower at night

- **Nocturnal animals** (active at night) - to avoid overheating or drying out during day; cooler underneath the soil by digging burrows

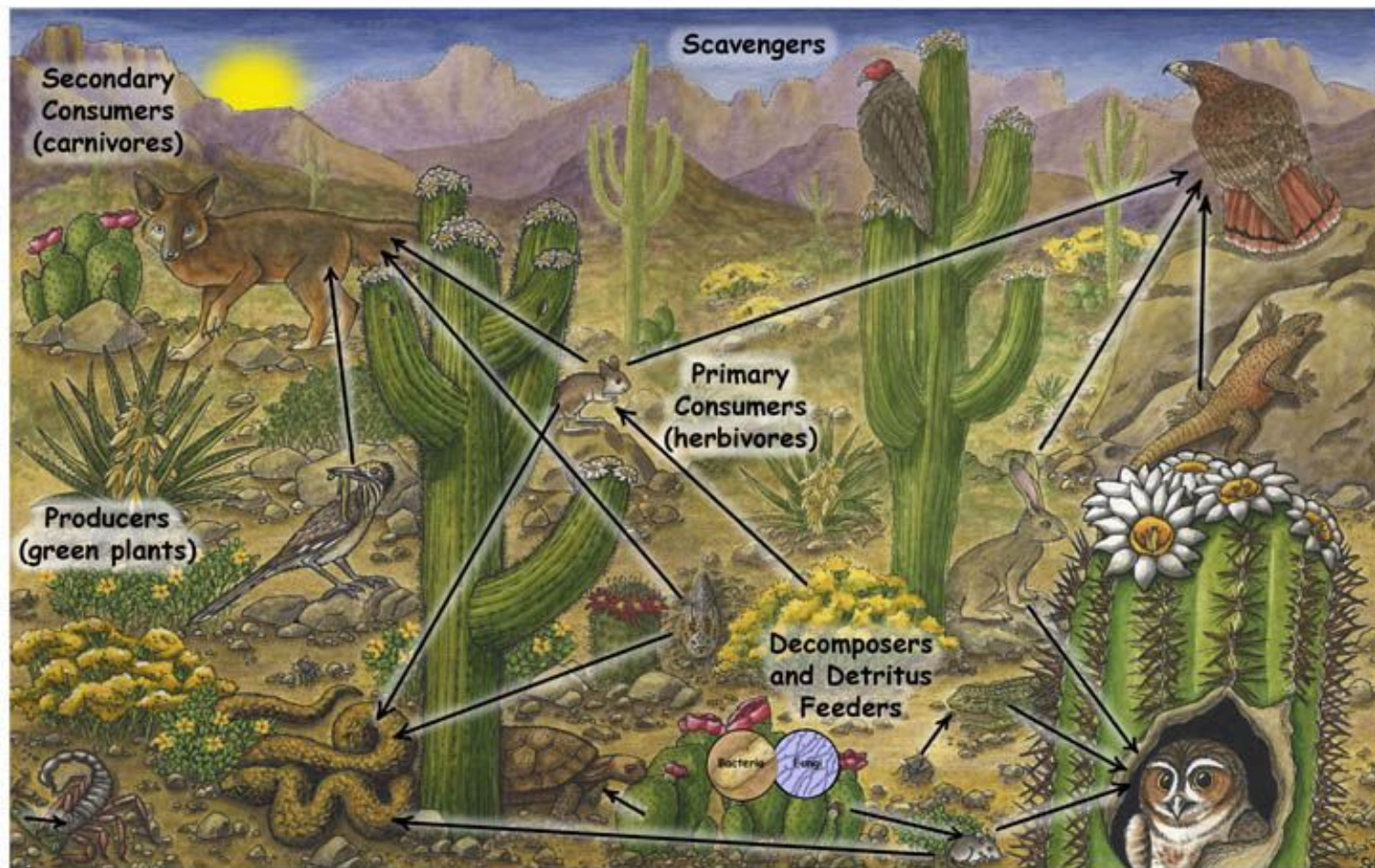
Soil - provide minerals for plants, building material for ground-nesting birds

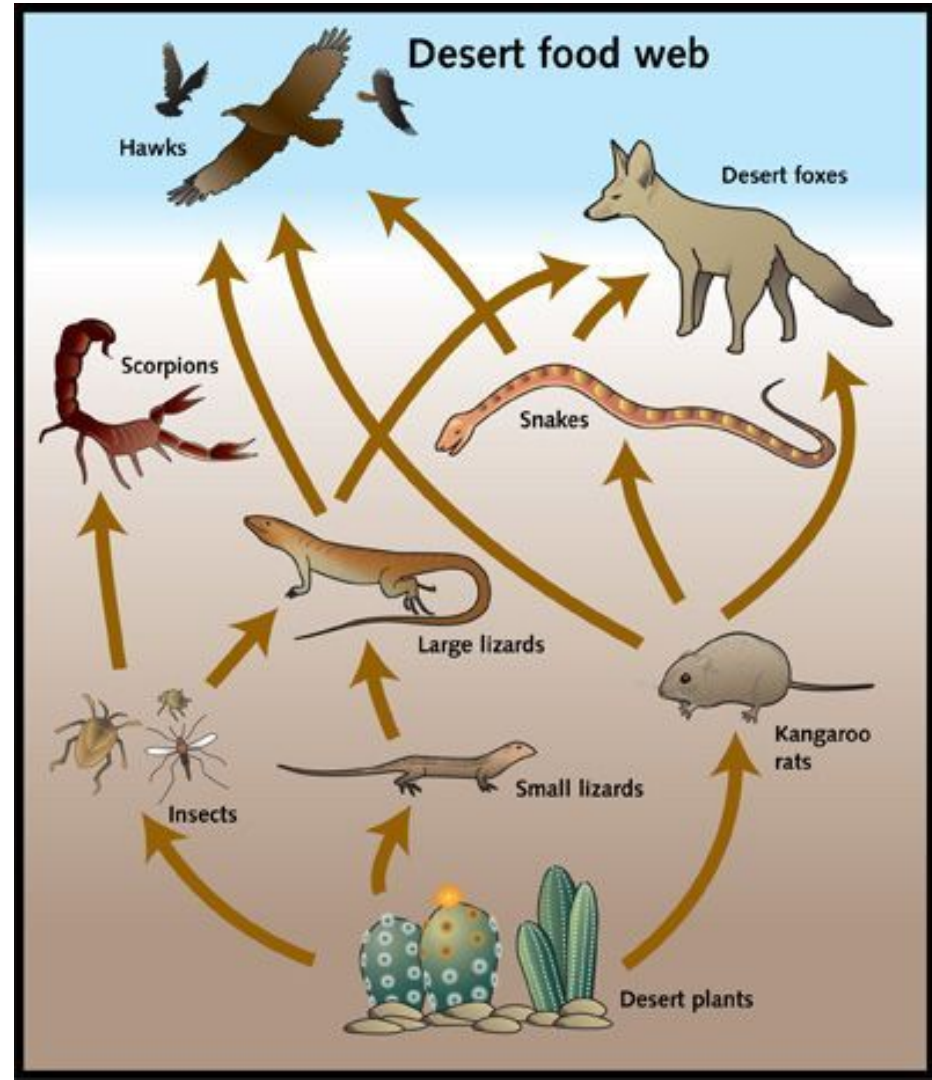
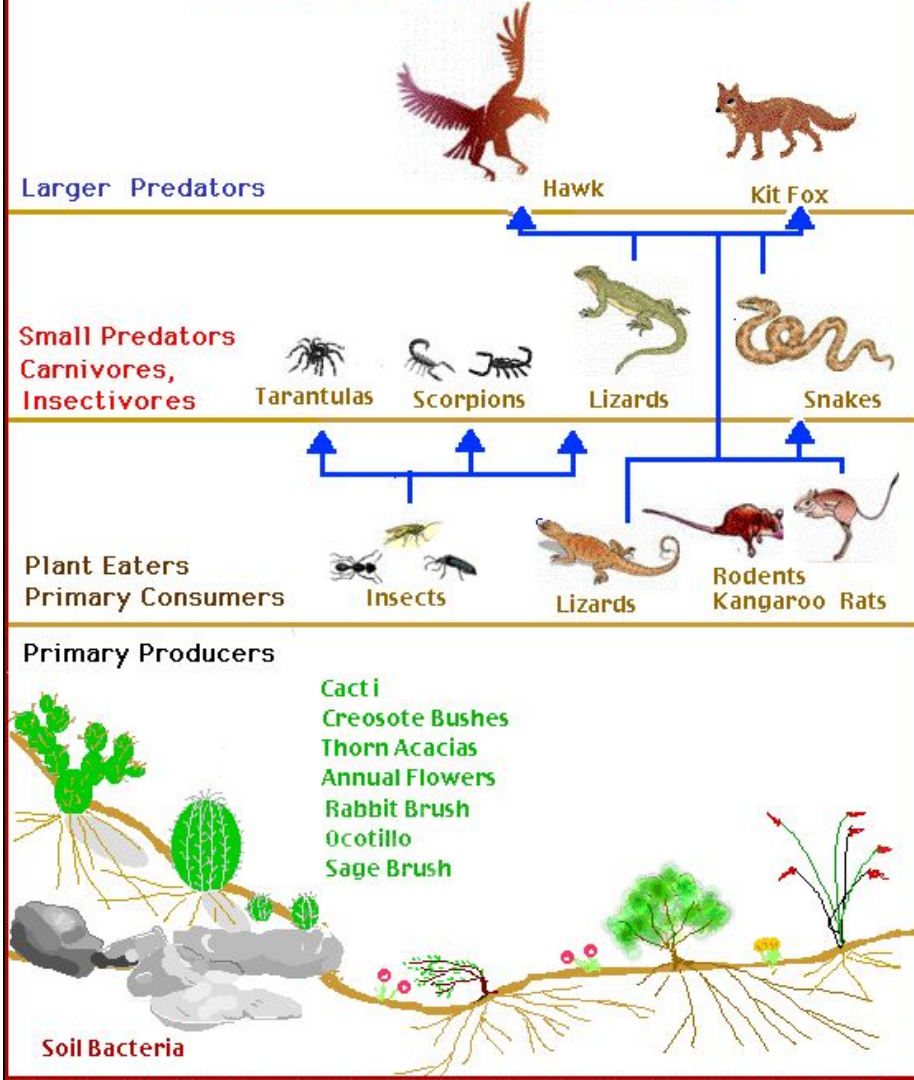
Water - keeps the cells of organisms alive; so dampened on rainfall to reproduce

Air - provides CO₂ for photosynthesis and O₂ for respiration



Desert Food Web





Habitats in a desert ecosystem

Habitat is the place where an organism naturally lives

Predict their habitats:

- Saguaro cactus
- Gila woodpecker
- Desert ant
- Termites
- Sap beetles
- Kangaroo rats



Mangrove forest ecosystem

Form forests along the coasts of tropical countries

Roots of trees can grow in sea water

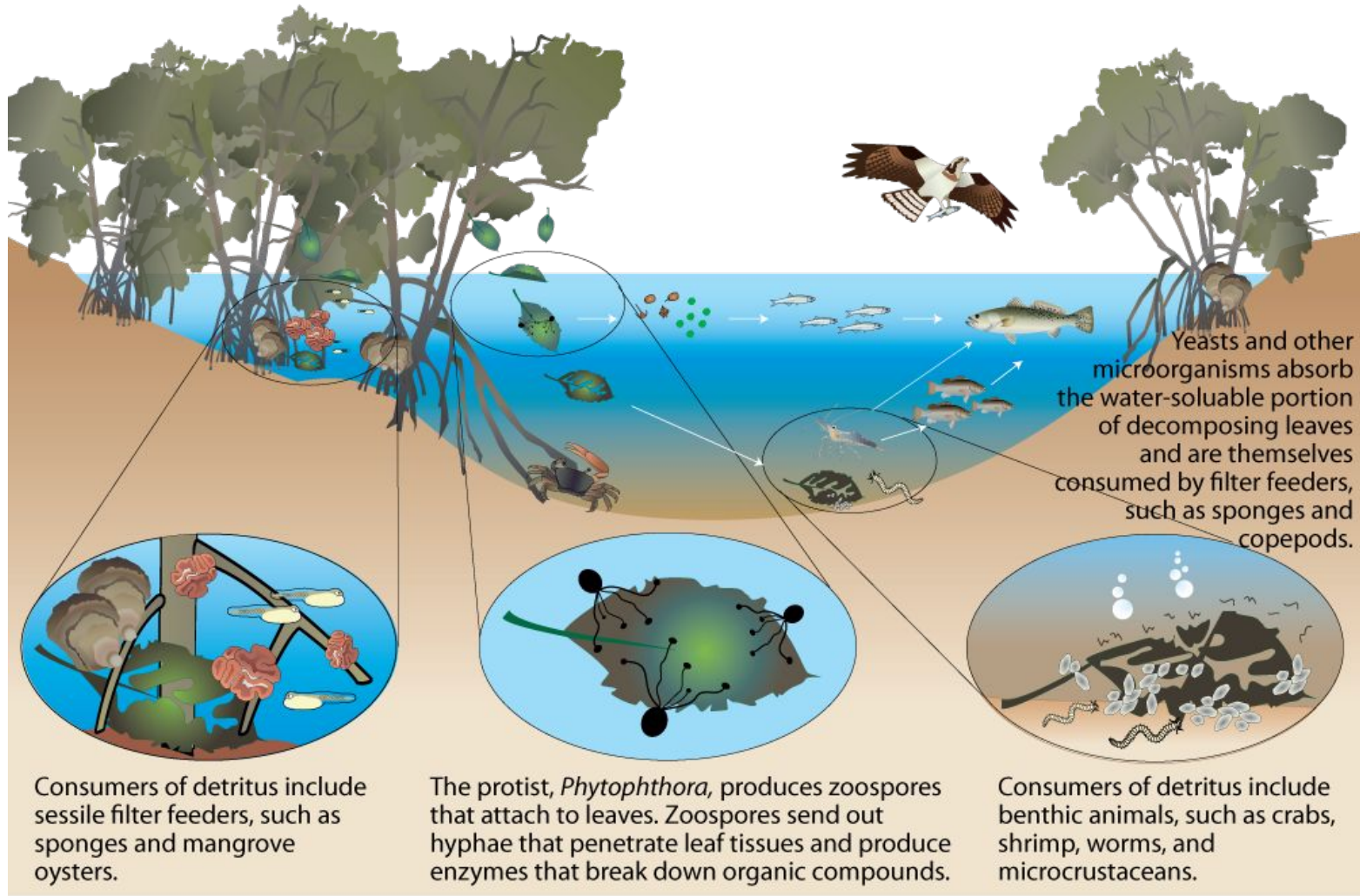
Young fishes live among roots (safe); mud skippers climb out onto the mud to find food

Fallen mangrove leaves on the mud decomposed by bacteria

Prawns and crabs eat the decomposed leaves

Crab-eating macaques climb through trees to catch crabs on tree roots and mud





Sea ice in the Arctic ocean

During winter, sea water freezes

Seals hunt for water in fish

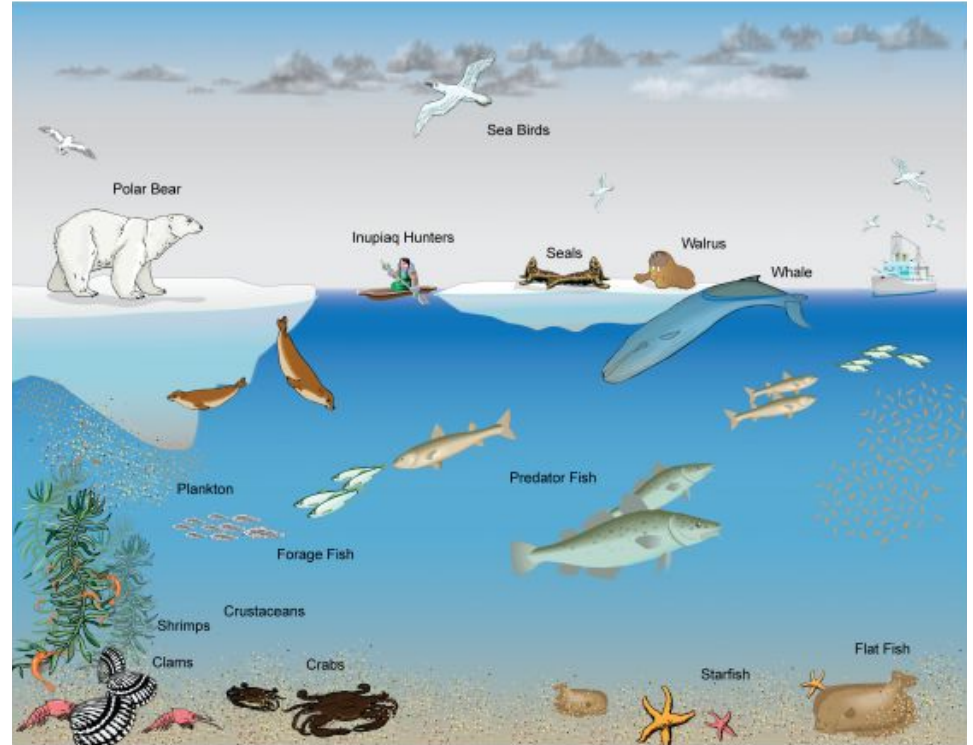
Polar bears patrol the ice looking for seals

Arctic foxes look for food on ice

Tiny algae grow under ice via sunlight

Shrimps eats the algae

Fishes eat the shrimps



Rice paddy (not a natural ecosystem)

Area farmed by people to grow rice

When paddy fields are flooded with water,

- Algae grows
- Fish swim into paddies from irrigation canals
- Frogs and dragonflies breed

Water heats up during day, cools at night

Fertilizers added to make rice grow faster; make algae grow faster;

More food for animals

