Name _____

Matter in Natural Cycles

Fill in the circle by the correct answer. Then write the answers to numbers 3, 4, and 5.

1. An organism growing bigger is evidence that _____.
   - Ⓐ energy that didn't exist on Earth before has transferred to the organism
   - Ⓑ the organism has created matter that didn't exist before
   - Ⓒ matter has transferred to the organism from another place
   - Ⓓ the organism has not gained or lost any mass

2. According to the text, _____.
   - Ⓐ the matter in sedimentary rock eventually transfers to another place
   - Ⓑ igneous rock cannot break down as other rocks can
   - Ⓒ weathering and erosion is the only way rock matter changes
   - Ⓓ sedimentary rock is not composed of matter

3. Explain how the law of conservation of mass makes it possible for the grasshopper to help the frog survive.

_____

_____

4. What would happen if food matter simply disappeared after organisms ate? Explain how Earth would be different.

_____

_____

5. Why is the law of conservation of mass essential for all of the natural cycles to work?

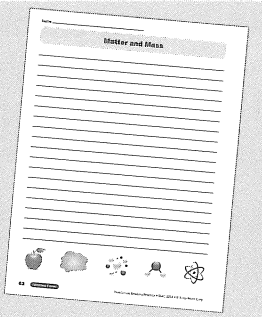
_____

_____

Write About the Topic

Use the Writing Form to write about what you read.

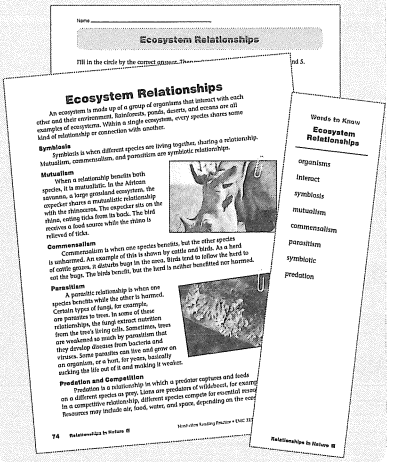
Compare and contrast how matter moves through the three cycles mentioned in the text. Use details and examples.



Relationships in Nature

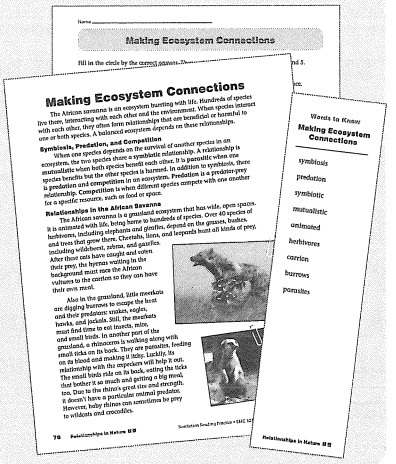
Level 1 ■

Words to Know list, Reading Selection, and Reading Comprehension questions



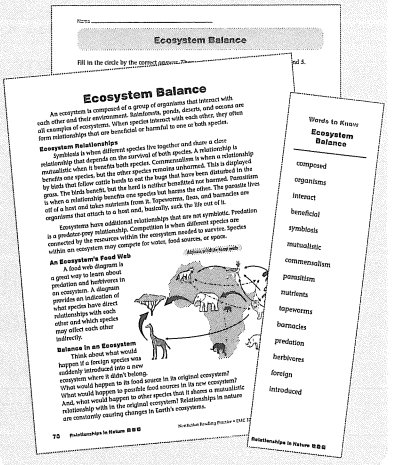
Level 2 ■■

Words to Know list, Reading Selection, and Reading Comprehension questions



Level 3 ■■■

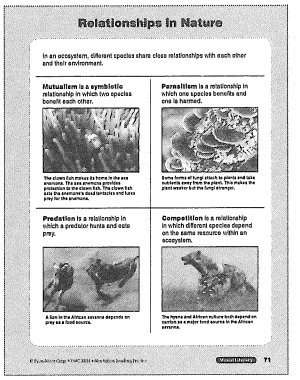
Words to Know list, Reading Selection, and Reading Comprehension questions



Assemble the Unit

Reproduce and distribute one copy for each student:

- Visual Literacy page: Relationships in Nature, page 71
- Level 1, 2, or 3 Reading Selection and Reading Comprehension page and the corresponding Words to Know list
- Graphic Organizer of your choosing, provided on pages 180–186
- Writing Form: Relationships in Nature, page 72



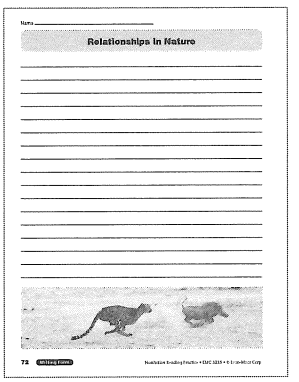
Visual Literacy

Introduce the Topic

Read aloud and discuss the Relationships in Nature text and photographs. Explain that all ecosystems have different species that interact with each other and their environments. Point out that different relationships exist within one ecosystem and that they might be beneficial or harmful or have no effect at all on a species.

Read and Respond

Form leveled groups and review the Words to Know lists with each group of students. Instruct each group to read their selection individually, in pairs, or as a group. Have students complete the Reading Comprehension page for their selection.



Writing Form

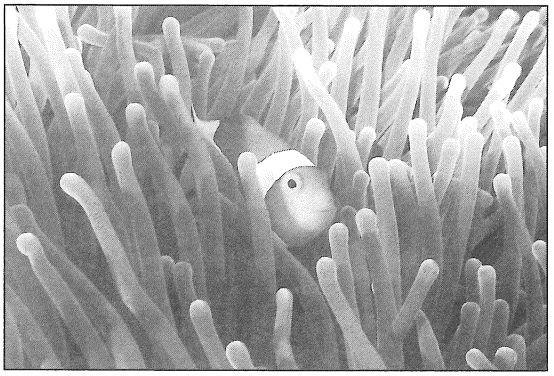
Write About the Topic

Read aloud the leveled writing prompt for each group. Tell students to use the Graphic Organizer to plan their writing. Direct students to use their Writing Form to respond to their prompt.

Relationships in Nature

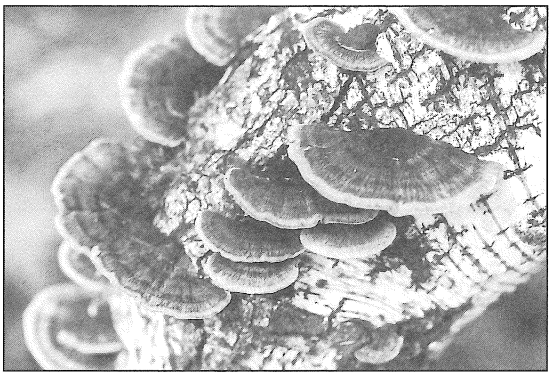
In an ecosystem, different species share close relationships with each other and their environment.

Mutualism is a **symbiotic** relationship in which two species benefit each other.



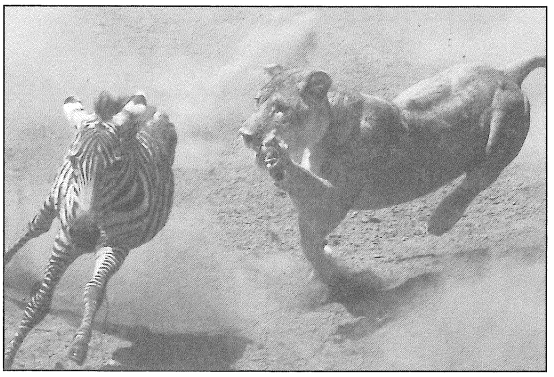
The clown fish makes its home in the sea anemone. The sea anemone provides protection to the clown fish. The clown fish eats the anemone's dead tentacles and lures prey for the anemone.

Parasitism is a relationship in which one species benefits and one is harmed.



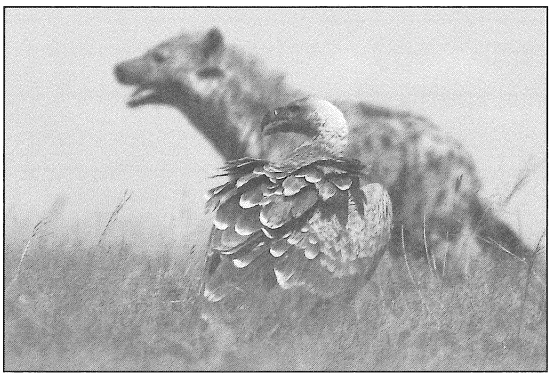
Some forms of fungi attach to plants and take nutrients away from the plant. This makes the plant weaker but the fungi stronger.

Predation is a relationship in which a predator hunts and eats prey.



A lion in the African savanna depends on prey as a food source.

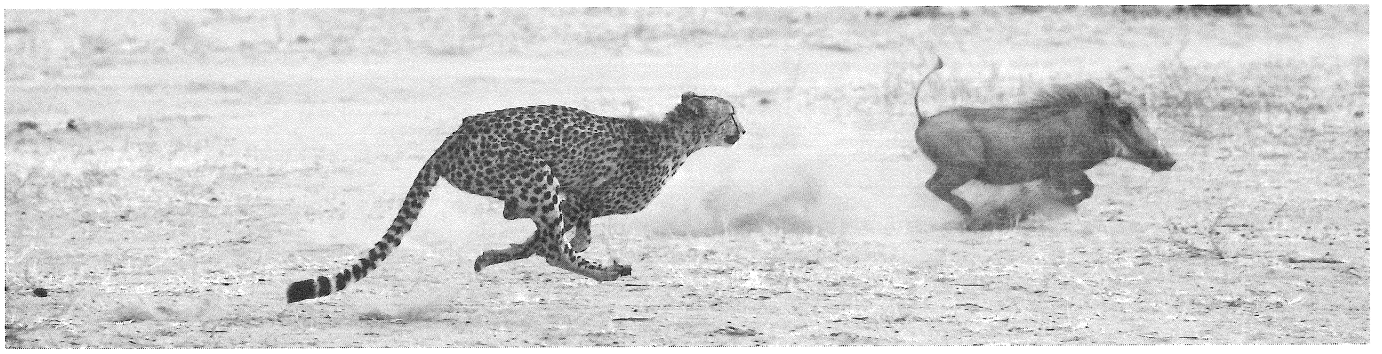
Competition is a relationship in which different species depend on the same resource within an ecosystem.



The hyena and African vulture both depend on carrion as a major food source in the African savanna.

Name _____

Relationships in Nature



Words to Know

Ecosystem Relationships

organisms

interact

symbiosis

mutualism

commensalism

parasitism

symbiotic

predation

Relationships in Nature ■

Words to Know

Making Ecosystem Connections

symbiosis

predation

symbiotic

mutualistic

animated

herbivores

carrion

burrows

parasites

Relationships in Nature ■■

Words to Know

Ecosystem Balance

composed

organisms

interact

beneficial

symbiosis

mutualistic

commensalism

parasitism

nutrients

tapeworms

barnacles

predation

herbivores

foreign

introduced

Relationships in Nature ■■■

Ecosystem Relationships

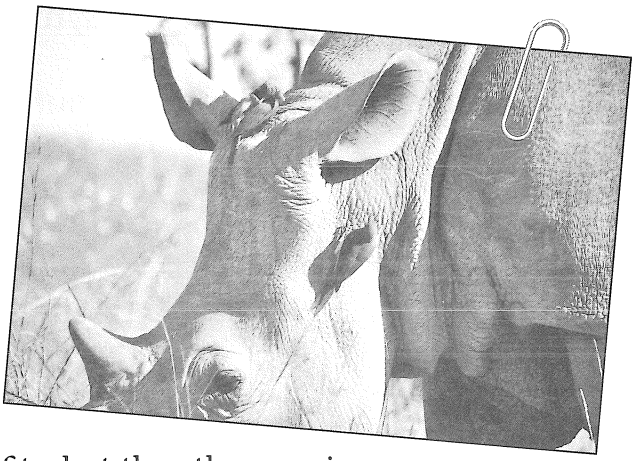
An ecosystem is made up of a group of organisms that interact with each other and their environment. Rainforests, ponds, deserts, and oceans are all examples of ecosystems. Within a single ecosystem, every species shares some kind of relationship or connection with another.

Symbiosis

Symbiosis is when different species are living together, sharing a relationship. Mutualism, commensalism, and parasitism are symbiotic relationships.

Mutualism

When a relationship benefits both species, it is mutualistic. In the African savanna, a large grassland ecosystem, the oxpecker shares a mutualistic relationship with the rhinoceros. The oxpecker sits on the rhino, eating ticks from its back. The bird receives a food source while the rhino is relieved of ticks.

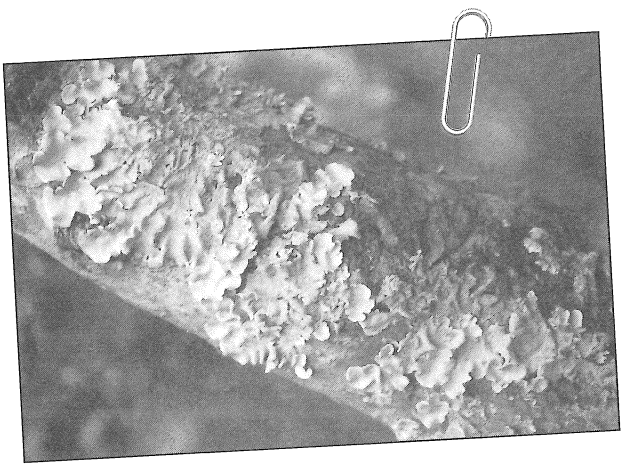


Commensalism

Commensalism is when one species benefits, but the other species is unharmed. An example of this is shown by cattle and birds. As a herd of cattle grazes, it disturbs bugs in the area. Birds tend to follow the herd to eat the bugs. The birds benefit, but the herd is neither benefitted nor harmed.

Parasitism

A parasitic relationship is when one species benefits while the other is harmed. Certain types of fungi, for example, are parasites to trees. In some of these relationships, the fungi extract nutrition from the tree's living cells. Sometimes, trees are weakened so much by parasitism that they develop diseases from bacteria and viruses. Some parasites can live and grow on an organism, or a host, for years, basically sucking the life out of it and making it weaker.



Predation and Competition

Predation is a relationship in which a predator captures and feeds on a different species as prey. Lions are predators of wildebeest, for example. In a competitive relationship, different species compete for essential resources. Resources may include air, food, water, and space, depending on the ecosystem.

Name _____

Ecosystem Relationships

Fill in the circle by the correct answer. Then write the answers to numbers 3, 4, and 5.

1. In the second photo within the text, the _____.
   - Ⓐ tree is benefitted by the fungus's living cells
   - Ⓑ fungus is surviving off of the tree's living cells
   - Ⓒ fungus is growing on the tree, but the tree is unharmed
   - Ⓓ tree and the fungus are sharing a mutualistic relationship

2. When birds follow cattle to find bugs to eat, the disturbed bugs are _____.
   - Ⓐ benefitted
   - Ⓑ parasitic
   - Ⓒ predators
   - Ⓓ prey

3. What would happen if the tree in a tree-fungi parasitic relationship suddenly died? Explain why this would happen.

   _____

   _____

4. In your opinion, which is the worst kind of relationship for an organism? Explain why.

   _____

   _____

5. Would it be possible for an organism <u>not</u> to be part of an ecosystem relationship? Why or why not?

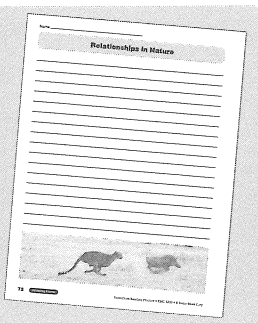
   _____

   _____

Write About the Topic

Use the Writing Form to write about what you read.

Describe an ecosystem you studied or know about and identify relationships from the text that are in it. Give specific examples.



Making Ecosystem Connections

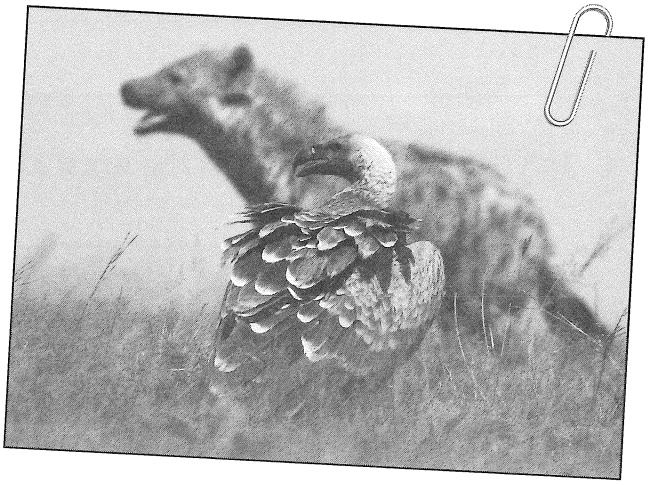
The African savanna is an ecosystem bursting with life. Hundreds of species live there, interacting with each other and the environment. When species interact with each other, they often form relationships that are beneficial or harmful to one or both species. A balanced ecosystem depends on these relationships.

Symbiosis, Predation, and Competition

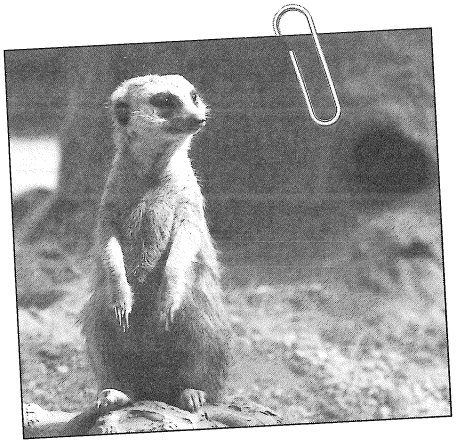
When one species depends on the survival of another species in an ecosystem, the two species share a **symbiotic** relationship. A relationship is **mutualistic** when both species benefit each other. It is **parasitic** when one species benefits but the other species is harmed. In addition to symbiosis, there is **predation** and **competition** in an ecosystem. **Predation** is a predator-prey relationship. **Competition** is when different species compete with one another for a specific resource, such as food or space.

Relationships in the African Savanna

The African savanna is a grassland ecosystem that has wide, open spaces. It is animated with life, being home to hundreds of species. Over 40 species of herbivores, including elephants and giraffes, depend on the grasses, bushes, and trees that grow there. Cheetahs, lions, and leopards hunt all kinds of prey, including wildebeest, zebras, and gazelles. After these cats have caught and eaten their prey, the hyenas waiting in the background must race the African vultures to the carrion so they can have their own meal.



Also in the grassland, little meerkats are digging burrows to escape the heat and their predators: snakes, eagles, hawks, and jackals. Still, the meerkats must find time to eat insects, mice, and small birds. In another part of the grassland, a rhinoceros is walking along with small ticks on its back. They are parasites, feeding on its blood and making it itchy. Luckily, its relationship with the oxpeckers will help it out. The small birds ride on its back, eating the ticks that bother it so much and getting a big meal, too. Due to the rhino's great size and strength, it doesn't have a particular animal predator. However, baby rhinos can sometimes be prey to wildcats and crocodiles.



Name _____

Making Ecosystem Connections

Fill in the circle by the correct answer. Then write the answers to numbers 3, 4, and 5.

1. Which sentence describes a mutualistic relationship?
   - Ⓐ Bees use flowers for pollen to make nectar, and flowers use bees to reproduce.
   - Ⓑ Vultures and hyenas compete for carrion as a food source in the savanna.
   - Ⓒ Mosquitos land on animals and feed on their blood for nutrients.
   - Ⓓ Rattle, an herb, attaches to grass roots and takes nutrients away from the grass.

2. Which of the following animals can be prey, according to the text?
   - Ⓐ jackal
   - Ⓑ eagle
   - Ⓒ meerkat
   - Ⓓ vulture

3. What would happen if two species were in competition, and one was more successful?

   _____

   _____

4. Is ecosystem balance important? How could eagles affect the mouse population?

   _____

   _____

5. Explain what it means for a species to be "benefitted" or "harmed" in an ecosystem.

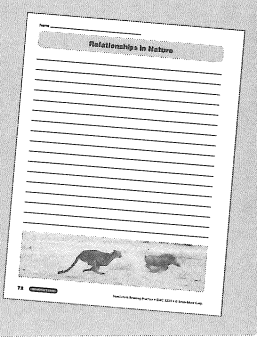
   _____

   _____

Write About the Topic

Use the Writing Form to write about what you read.

Compare the roles that the meerkat and the rhino play in their relationships with other species. Use details from the text.



Ecosystem Balance

An ecosystem is composed of a group of organisms that interact with each other and their environment. Rainforests, ponds, deserts, and oceans are all examples of ecosystems. When species interact with each other, they often form relationships that are beneficial or harmful to one or both species.

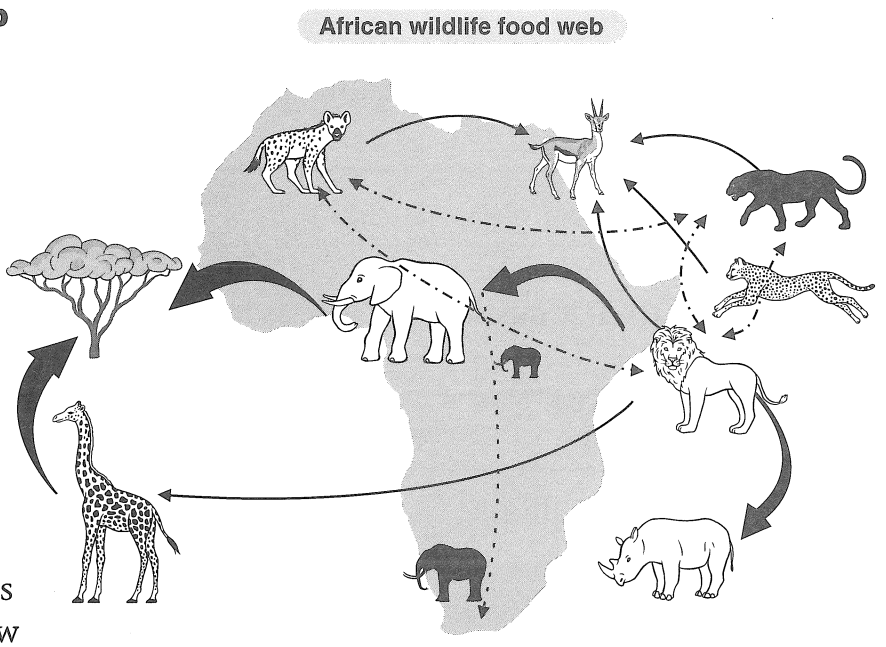
Ecosystem Relationships

Symbiosis is when different species live together and share a close relationship that depends on the survival of both species. A relationship is mutualistic when it benefits both species. Commensalism is when a relationship benefits one species, but the other species remains unharmed. This is displayed by birds that follow cattle herds to eat the bugs that have been disturbed in the grass. The birds benefit, but the herd is neither benefitted nor harmed. Parasitism is when a relationship benefits one species but harms the other. The parasite lives off of a host and takes nutrients from it. Tapeworms, fleas, and barnacles are organisms that attach to a host and, basically, suck the life out of it.

Ecosystems have additional relationships that are not symbiotic. Predation is a predator-prey relationship. Competition is when different species are connected by the resources within the ecosystem needed to survive. Species within an ecosystem may compete for water, food sources, or space.

An Ecosystem's Food Web

A food web diagram is a great way to learn about predation and herbivores in an ecosystem. A diagram provides an indication of what species have direct relationships with each other and which species may affect each other indirectly.



Balance in an Ecosystem

Think about what would happen if a foreign species was suddenly introduced into a new ecosystem where it didn't belong. What would happen to its food source in its original ecosystem? What would happen to possible food sources in its new ecosystem? And, what would happen to other species that it shares a mutualistic relationship with in the original ecosystem? Relationships in nature are constantly causing changes in Earth's ecosystems.