



# Mangroves of the Everglades

After reading the passage, Mangroves of the Everglades, and watching the video, Mangroves: Protectors of the Coast, students will be able to describe the structure and life cycle of a red mangrove and classify it as a flowering plant and complete the worksheet ([page 5](#)) regarding the life cycle of the red mangrove tree.

## Standards:

**SC.3.L.14.1:** Describe structures in plants and their roles in food production, support, water and nutrient transport, and reproduction.

Also assesses:

**SC.3.L.14.2:** Investigate and describe how plants respond to stimuli (heat, light, gravity), such as the way plant stems grow toward light and their roots grow downward in response to gravity.

**SC.4.L.16.1:** Identify processes of sexual reproduction in flowering plants, including pollination, fertilization (seed production), seed dispersal, and germination.

**SC.3.L.15.2:** Classify flowering and nonflowering plants into major groups such as those that produce seeds, or those like ferns and mosses that produce spores, according to their physical characteristics.

Assessed under:

**SC.5.L.14.2** Compare and contrast the function of organs and other physical structures of plants and animals, including humans, for example: some animals have skeletons for support—some with internal skeletons, others with exoskeletons—while some plants have stems for support.

**Lexile Level:** 810 to 1000

**Video:** Mangroves: Protectors of the Coast video by Odyssey Earth.

<https://www.odysseyearth.com/videos/mangroves-protectors-of-the-coast/>

**Everglades Literacy Connection:** 3rd Grade Lesson 2 - Classifying Everglades Plants and Their Habitats: <https://www.evergladesliteracy.org/third-grade>

# Mangroves of the Everglades

Here in the Everglades, there are three mangrove plant species. The white mangrove, black mangrove, and the red mangrove. This list is in order from the most inland to the most coastal. **Mangroves** are a group of trees with tangled roots that grow along the coast. Mangroves are considered the “protectors of the coast”, but do you know why? Mangroves provide ecosystem services. **Ecosystem services** are natural benefits to humans from nature. All around the world, mangroves act as a barrier between the water and the land. Mangroves have prop roots that are dense, intertwined, sturdy, strong, and resilient. They protect the land from storms with strong wind and heavy rain. They also provide nursery-like habitats that protect smaller aquatic wildlife. Mangroves also stabilize Florida’s coastline ecosystem by preventing erosion, or the wearing away of soil and rock. The Everglades ecosystem would not be what it is without mangroves. Mangroves are essential to the survival of coastlines, oceans, and us.



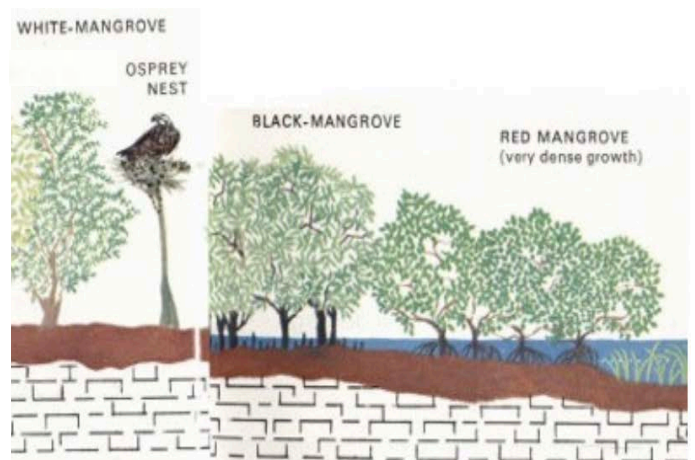
White mangrove, *Laguncularia racemosa*



Black mangrove, *Avicennia germinans*



Red mangrove, *Rhizophora mangle*



Mangrove species diagram depicting order of species from most inland to coastal. From *Everglades Wildguide*, by Jean Craighead George.

## Red Mangrove Life Cycle

Red mangroves reproduce with their flowers and seeds. Red mangroves have flowers that bloom in summer and autumn. Mangrove flowers have **pollen**, or a powdery substance on the flower that helps with reproduction. Pollination occurs when pollen is spread by wind and insects to mix with other mangroves nearby. Once pollination occurs, the seeds stay attached to the parent tree and begin to **germinate**, or grow from the seed. Red mangrove seedlings are called **propagules**. Mangrove propagules are the product of successful flower pollination. Reproduction and propagules are necessary for the continued survival of the mangrove species overall. The propagules become fully developed before falling off the parent tree. The propagule then floats away with the waves of the water until it is able to stop and settle into an appropriate space. Here it will root and become a whole new tree. A mangrove propagule may float in water for over a year before rooting.

## Red Mangrove Food Production

Leaves of the mangroves are very important to its survival. One function of the leaves is to make food for the mangrove plant through **photosynthesis**. Photosynthesis is a process that plants undergo by combining energy from sunlight, carbon dioxide, and water to make food to grow. A large portion of the photosynthesis process takes place in the leaves of plants. This is because leaves contain **chlorophyll**. Chlorophyll is the substance that gives leaves their characteristic green color, which absorbs light energy. During photosynthesis, chlorophyll's function in the leaves is to absorb and store sunlight energy. The sunlight energy is turned into food for the plant and helps the plant live.



Red mangrove propagule



Red mangrove flowers



Red mangrove fruit

*image by UF/IFAS blog post*

## Red Mangrove Adaptations

Red mangroves have **adaptations**. An adaptation is a body part or a behavior that a plant or animal has to help it survive in its environment.

One physical adaptation of the red mangrove is their iconic roots. Red mangroves grow **aerial prop roots**, or roots that are above the ground. Their function is to stabilize and provide extra support. Think of aerial prop roots as supportive as your skeleton. Prop roots also absorb and deliver water and minerals to the rest of the plant, which is necessary for the mangrove to survive.

Another adaptation is that red mangroves are able to survive in **brackish water**. Brackish water is saltwater and freshwater mixed together. Red mangrove trees are able to remove salt from the brackish water through their roots, a process called **salt exclusion**. Red mangrove roots contain **membranes**. Membranes are thin layers of cells that act like boundaries. Root membranes primary function is to prevent salt from entering the plant. Instead, they let the water pass through so the plant can only absorb freshwater. Other species of plants may not be able to survive in the brackish water. Because of this, the red mangroves have more space and less competition for resources from other plants.



Settled propagule growing



Mature red mangrove tree

Mangroves are important to the Everglades because they protect the shoreline and provide a nursery for young aquatic life. They also provide shelter and a nesting habitat for birds in the Everglades. And, mangroves are a home for many threatened and endangered species in the Everglades. The red mangrove can be found all along Florida's southern coast, but they need our help! Mangroves are threatened by pollution and chemicals, so it's important to keep trash out of the waterways. Mangroves are also threatened by habitat loss and climate change. Never remove mangroves from their native habitats because they are protected under state and local regulations.

The Everglades ecosystem would not be what it is without mangroves. Mangroves are essential to the survival of coastlines, oceans, and us!



# Mangroves of the Everglades Activity Worksheet

**Directions:** After reading the passage, Mangroves of the Everglades, and watching Mangroves: Protectors of the Coast, fill out the following worksheet activity.

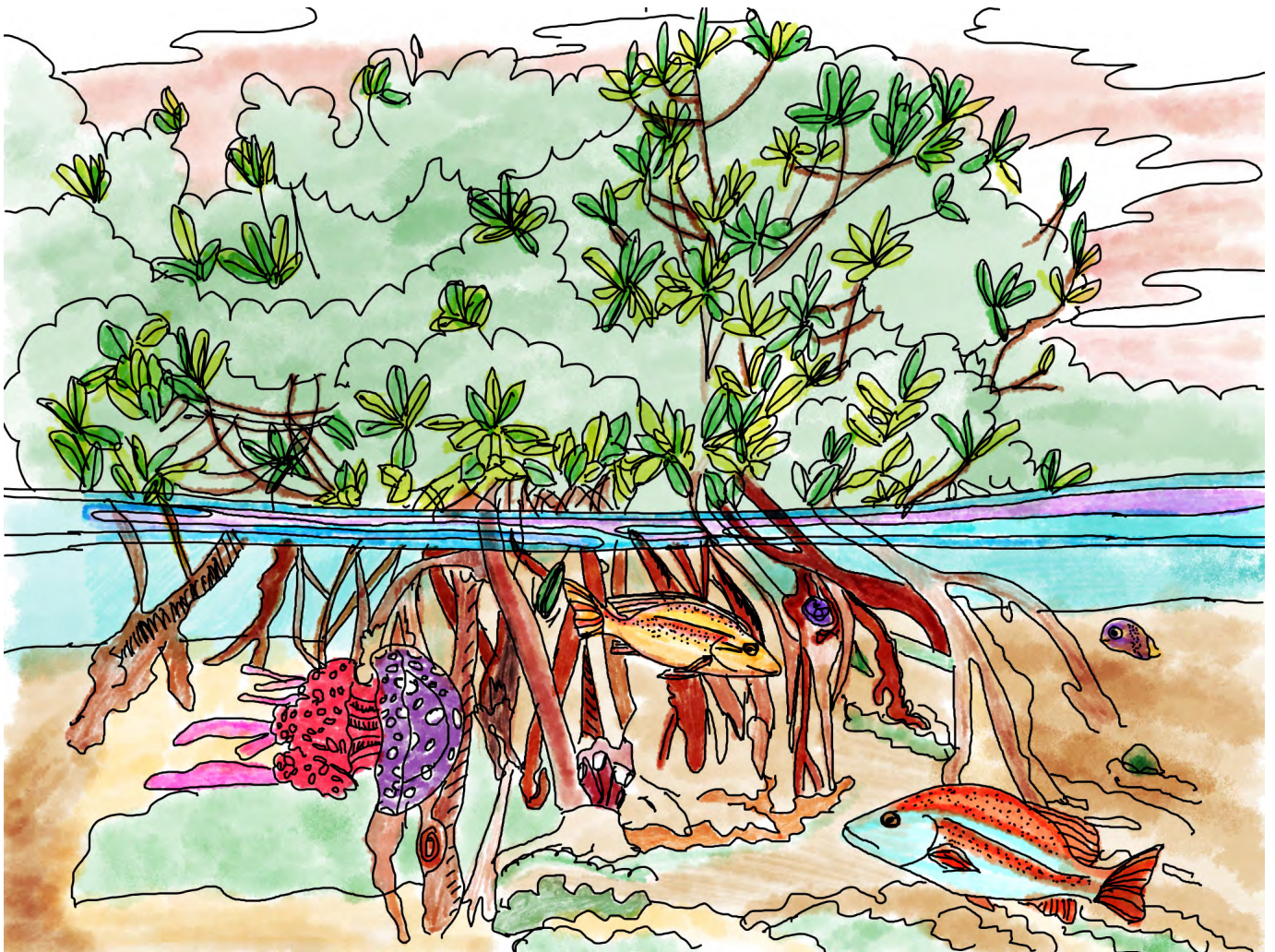
**Part 1:** Match the glossary words on the left to the correct corresponding definitions on the right. Vocabulary words can be found in the reading passage and the video.

- |                             |   |
|-----------------------------|---|
| _____ 1. Mangrove Propagule | A. Root like structure coming out of the ground (looks like soda straws).   |
| _____ 2. Chlorophyll        | B. Powdery substance on the flower that aids in reproduction.   |
| _____ 3. Lenticils          | C. Roots that are above the ground.   |
| _____ 4. Membranes          | D. The process in which mangroves get rid of salt.  |
| _____ 5. Aerial Prop Roots  | E. Natural benefits to humans from nature.  |
| _____ 6. Salt Exclusion     | F. Pore like structures on the mangroves prop roots that allow oxygen to be absorbed into the root tissues.         |
| _____ 7. Ecosystem Services | G. A group of trees with tangled roots that grow along the coast.   |
| _____ 8. Photosynthesis     | H. Saltwater and freshwater mixed together.   |
| _____ 9. Mangal             | I. The substance that gives leaves their green color.   |
| _____ 10. Mangroves         | J. A process that plants undergo by combining energy from sunlight, carbon dioxide, and water to make food to grow. |
| _____ 11. Pneumatophores    | K. Tangled mangrove community.  |
| _____ 12. Germinate         | L. A body part or a behavior that a plant or animal has to help it survive in its environment.                      |
| _____ 13. Erosion           | M. Thin layers of cells that act like boundaries  |
| _____ 14. Adaptation        | N. The wearing away of soil and rock.   |
| _____ 15. Brackish Water    | O. Grow from a seed.  |
| _____ 16. Pollen            | P. Mangrove seedling.   |



**Part 2:** Mark each sentence as either **True (T)** or **False (F)**.

1. South Florida is home to two species of mangrove tree. \_\_\_\_\_
2. Red and black mangroves have pore-like structures which are used to absorb oxygen into their roots. \_\_\_\_\_
3. Mangroves are responsible for contributing to beach erosion in coastal areas. \_\_\_\_\_
4. Mangrove trees are more tolerant of salty environments than other trees. \_\_\_\_\_



**Part 3:** Using the photos below, put a red mangrove life cycle in order. In the space provided for each red mangrove life cycle photo, write the number order in which it would fit into the life cycle. Start with the red mangrove flower stage.





**Part 4:** Using the correct order of the red mangrove life cycle from Part 3, draw a diagram with the 5 life cycle stages. Start with the red mangrove flower stage and label it as the first stage.





# Mangroves of the Everglades **Answer Key**

**Directions:** After reading the passage, Mangroves of the Everglades, and watching Mangroves: Protectors of the Coast, fill out the following worksheet activity.

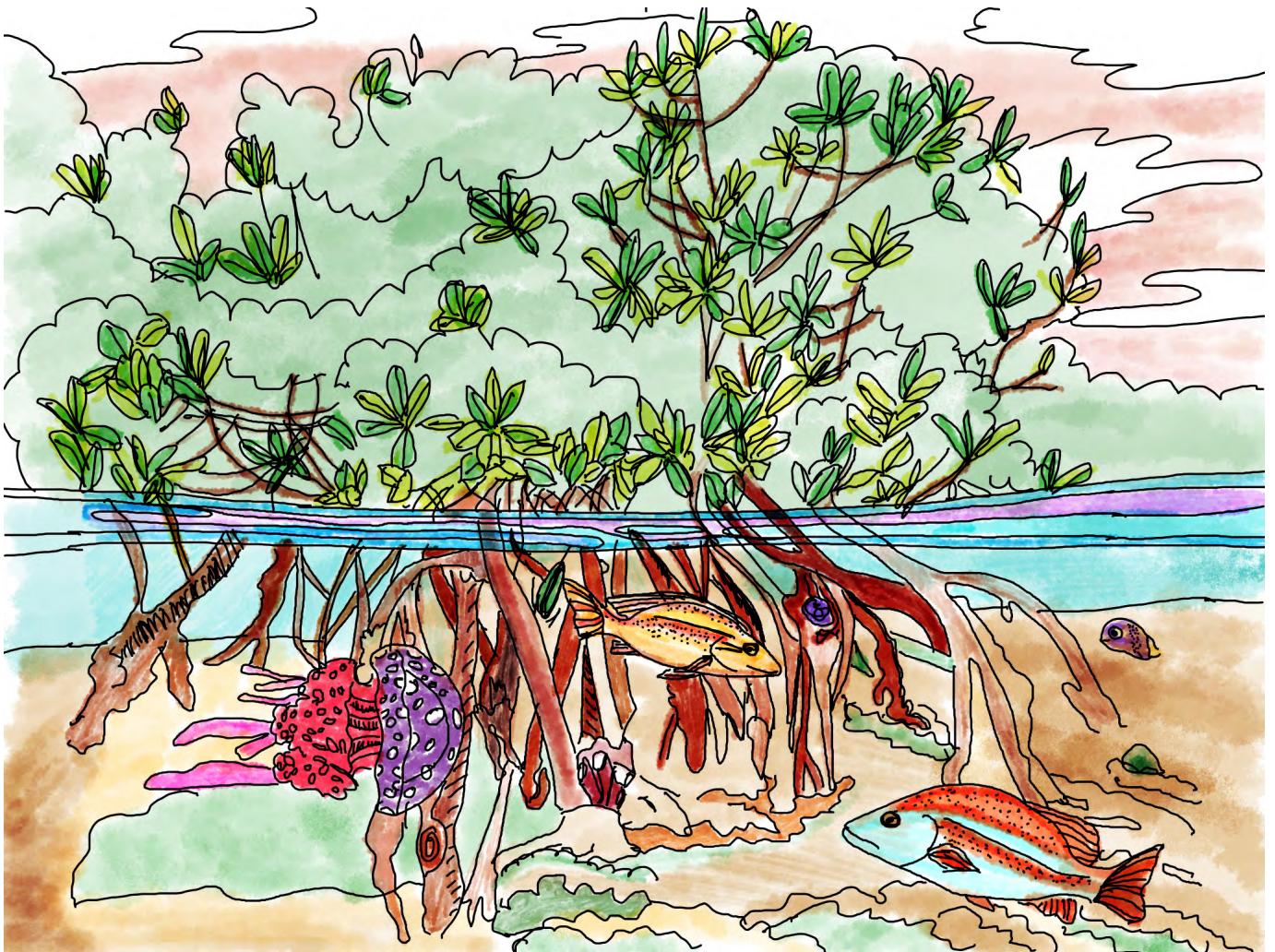
**Part1:** Match the glossary words on the left to the correct corresponding definitions on the right. Vocabulary words can be found in the reading passage and the video.

- |                                |   |
|--------------------------------|---|
| <u>P</u> 1. Mangrove Propagule | A. Root like structure coming out of the ground (looks like soda straws).   |
| <u>I</u> 2. Chlorophyll        | B. Powdery substance on the flower that aids in reproduction.   |
| <u>F</u> 3. Lenticils          | C. Roots that are above the ground.   |
| <u>M</u> 4. Membranes          | D. The process in which mangroves get rid of salt.  |
| <u>C</u> 5. Aerial Prop Roots  | E. Natural benefits to humans from nature.  |
| <u>D</u> 6. Salt Exclusion     | F. Pore like structures on the mangroves prop roots that allow oxygen to be absorbed into the root tissues.         |
| <u>E</u> 7. Ecosystem Services | G. A group of trees with tangled roots that grow along the coast.   |
| <u>J</u> 8. Photosynthesis     | H. Saltwater and freshwater mixed together.   |
| <u>K</u> 9. Mangal             | I. The substance that gives leaves their green color.   |
| <u>G</u> 10. Mangroves         | J. A process that plants undergo by combining energy from sunlight, carbon dioxide, and water to make food to grow. |
| <u>A</u> 11. Pneumatophores    | K. Tangled mangrove community.  |
| <u>O</u> 12. Germinate         | L. A body part or a behavior that a plant or animal has to help it survive in its environment.                      |
| <u>N</u> 13. Erosion           | M. Thin layers of cells that act like boundaries  |
| <u>L</u> 14. Adaptation        | N. The wearing away of soil and rock.   |
| <u>H</u> 15. Brackish Water    | O. Grow from a seed.  |
| <u>B</u> 16. Pollen            | P. Mangrove seedling.   |



**Part 2:** Mark each sentence as either True (T) or False (F).

1. South Florida is home to two species of mangrove tree.   F
2. Red and black mangroves have pore-like structures which are used to absorb oxygen into their roots.   T
3. Mangroves are responsible for contributing to beach erosion in coastal areas.   F
4. Mangrove trees are more tolerant of salty environments than other trees.   T



**Part 3:** Using the photos below, put a red mangrove life cycle in order. In the space provided for each red mangrove life cycle photo, write the number order in which it would fit into the life cycle. Start with the red mangrove flower stage.



Mature red mangrove tree

5



Red mangrove propagule

3



Red mangrove fruit

2



Settled propagule growing

4



Red mangrove flowers

1

**Part 4:** Using the correct order of the red mangrove life cycle from Part 3, draw a diagram with the 5 life cycle stages. Start with the red mangrove flower stage and label it as the first stage.

