MANGROVE FORESTS

MANGROVES ARE TREES AND SHRUBS THAT LIVE IN THE COASTAL INTERTIDAL ZONE.

Mangroves have special adaptations that allow them to thrive in saltwater conditions. They can be easily recognized by their prop roots, which allows the trees to handle the daily rise and fall of tides. The roots also slow down the movement of tidal waters, allowing sediments to settle out of the water and build up on the muddy bottom.

Mangrove forests help to stabilize the coastline, reducing erosion from storm surges, currents, waves, and tides. The elaborate root system of the mangroves also makes these areas attractive to fish and other organisms seeking food and shelter from predators.

LESSON PLAN

Learning Standards

- Common Core: CCSS.ELA-Literacy.RST.6-8.7
- NGSS: 3-LS3-2., 4-LS1-1., 4-ESS3-2., 5-LS2-1., MS-LS1-4, MS-LS2-1, MS-LS2-2, MS-LS2-5
- Ocean Literacy: Principle 2A, Principle 5

Vocabulary

- Mangrove- tropical plants that are adapted to loose, wet soils, salt water, and being periodically submerged by tides
- Ecosystem- a biological community of interacting organisms and their physical environment
- Ecosystem services- any positive benefit that wildlife or ecosystems provide to people
- Nursery habitat- a subset of all habitats where juveniles of a species occur, having a greater level of productivity per unit area than other juvenile habitats
- Erosion- the geological process in which earthen materials are worn away and transported by natural forces such as wind or water

Learning Objectives

Students should be able to

- Explain the importance of mangroves
- Describe the relationship between a mangrove environment/ecosystem and other environments/ecosystems
- Explain why mangroves are important for juvenile sharks

ACTIVITY 1:

Place the plants and animals in the correct location on the cross-section of the coastal ecosystems.

Mangroves are an ideal habitat for small, juvenile fish to grow up with an abundance of food and protection from larger predators. Almost all fish and shellfish caught by commercial and recreational anglers spend some part of their life cycles in or near mangroves. Seagrass communities typically serve as the link between wetland and mangrove communities and hard-bottom and coral reefs.

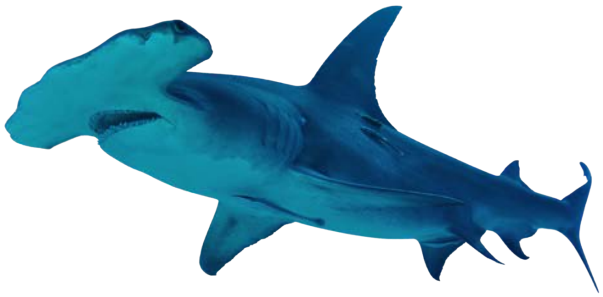
Cut out each plant/ animal and determine which ecosystem that organism lives in. Paste or tape the organisms in the appropriate locations. Hint: locate where the seagrass and coral communities would be in respect to the mangroves first!

Common Snook

Staghorn Coral

Southern Stingray

Turtle Grass



Great Hammerhead Shark

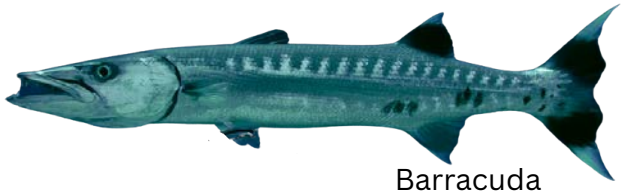
Yellow Stingray

Juvenile Barracuda

Spiny Lobster

Elkhorn Coral

Lionfish



Barracuda

Mangrove Crab

Blue Heron

Juvenile Lemon Shark

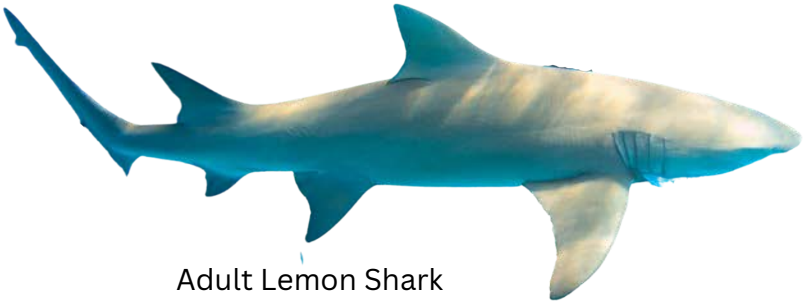
Pipefish

Upside-down Jellyfih

Yellowfin Mojarra

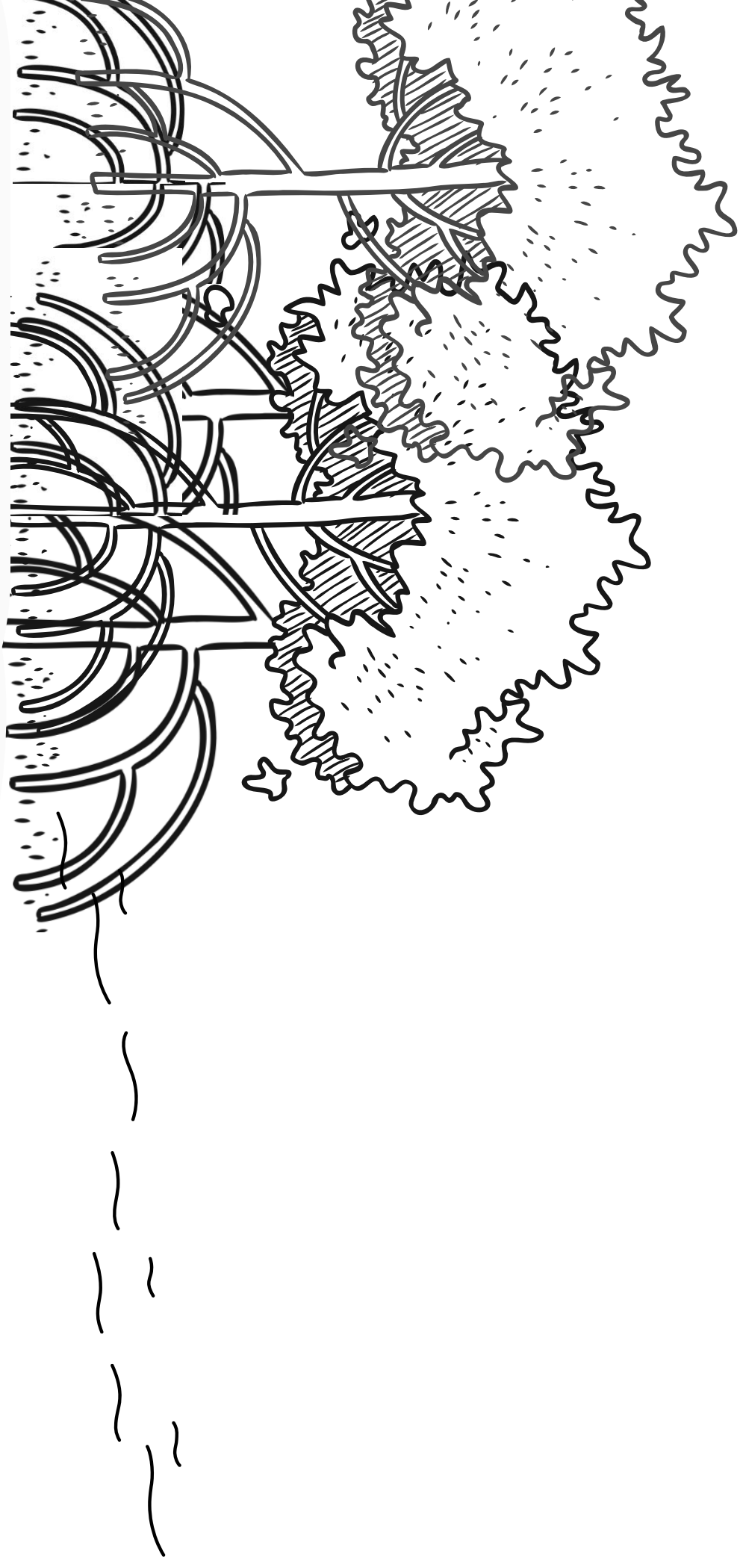
Mangrove Snapper

Juvenile Nurse Shark



Adult Lemon Shark

Juvenile Queen Conch



ACTIVITY 2:

Mangroves provide numerous ecosystem services, or positive benefits, to us on land. Circle which services are provided by mangrove forests.

provides timber

provides opportunities for recreation

serves as a nursery habitat for sharks and other fish

carbon sequestration

climate regulation

provides fresh water

provides food

storm and flood protection

supports healthy fisheries

serves as a reservoir for disease

erosion control

Mangroves & Sharks

The lemon shark (*Negaprion brevirostris)* is a large (~3 meters) coastal shark found in tropical and temperate waters. We know a lot about the life history of this species of shark in particular because of a tiny Bahamian island 50 miles east of Miami called Bimini. In the crystal-clear waters surrounding Bimini lemon sharks of all sizes can be found. During spring, large females return to give birth in the same nurseries they were born. The nurseries are dense mangrove forests that provide cover and foraging opportunities for baby lemon sharks as they mature. The mangrove forests surround an open sand flat lagoon where older, juvenile lemon sharks forage on menhaden and smaller lemon sharks. Once these sharks reach adulthood, they travel among a variety of coastal habitats including mangroves, coral reefs, and estuaries. Eventually, the adults return to begin the cycle over again. Coastal mangrove forests and lagoons provide critical habitat for this species' life history.

ACTIVITY 3:

Make an advocacy poster!

The mangroves need your help! The fictional coastal town of Coral Village has a lush mangrove forest home to a handful of juvenile lemon sharks. These little lemon sharks grow big and strong here before heading out of the safety provided by the mangroves, only to return to this exact forest to give birth to their young. A billionaire land developer chose Coral Village as the site for their new resort and golf course and is demanding the removal of the mangrove forest for a better ocean view.

How would you communicate to the developers, stakeholders, and public that these mangroves are important for protecting sharks?