# Sand Tiger Shark

## Task #1
## Animal Research

| | |
|---|---|
| **Climate** | • Prefers warm water, averages between 72-82°F<br>• Lives in temperate and tropical oceans around the world |
| **What covers their body? How is this helpful?** | • Covered in dermal denticles (tooth-like scales that are embedded in their skin)<br>• Dermal denticles provide protection and reduce friction as the shark moves through the water |
| **Social Dynamic** | • Hunts in groups which helps herd the prey together before attacking<br>• Experience fission-fusion behavior (when social groups split (fission) or merge (fusion) as they move through the environment)<br>• Groups form and break apart depending on environment and time of year |
| **Appearance** | • Light brown to gray on top and paler below (countershading)<br>• Scattered dark spots<br>• Height: 10 ft. long / Weight: up to 350 lbs. |
| **How do they move? How would that help them in their habitat?** | • Their dorsal fins extend beyond the pectoral fins below, and the upper portion of its tail is longer than the lower lobe, which aids swift movement<br>• Only shark species that comes to the surface to gulp air.<br>  ◦ Air ends up in the shark's stomach, which makes it more buoyant so it can float motionless in the water as it watches for prey |
| **How do they care for their young?** | • There is no parental care<br>• Females give birth to live young called pups<br>• Newborns can swim and eat on their own right away |
| **What do they eat? What adaptations do they have to support their diet?** | • Prefers hunting fish and invertebrates inshore and near reefs, surf, and shallow bays<br>• Three rows of teeth<br>• Hunts at night |
| **Habitat** | • Likes shallow water close to shore<br>• Found in waters ranging in depths from 6 to 620 ft. |

## Task #2

### Sand Tiger Shark Needs in a Zoo

After learning about what sand tiger sharks need in the wild, students are prompted to write things that sand tiger sharks would need in a zoo. Below are suggested answers but students are encouraged to be creative.

- Temperature controlled pool with water currents
- Large enough space to swim
- Feeding area
- Lighting that mimics the natural sunrise and sunset times
- Rock structures, caves, and open sandy areas to rest
- Can live with other sharks or fish
- Life Suport system to ensure water quality and chemistry

## Sand Tiger Shark Enrichment

**Suggested Enrichment:**

- **Environmental Enrichment-** Moving underwater structures, changing water flow and current
- **Food Enrichment-** Hiding parts of food around the habitat, using underwater feeding devices, and varying the location and time of feeding
- **Manipulative Enrichment-** Floating puzzle feeders
- **Sensory Enrichment-** changing lighting schedule and changing temperature gradients
- **Social Enrichment-** Interacting with other animals, interacting with divers, training with animal care specialists

**Things to avoid:**

- Continuous use of the same form of enrichment
- Electromagnetism and loud noises
- Small enrichment or small pieces that could be ingested (string, screws, soft plastics)

## Task #3
## Sand Tiger Shark Conservation Status

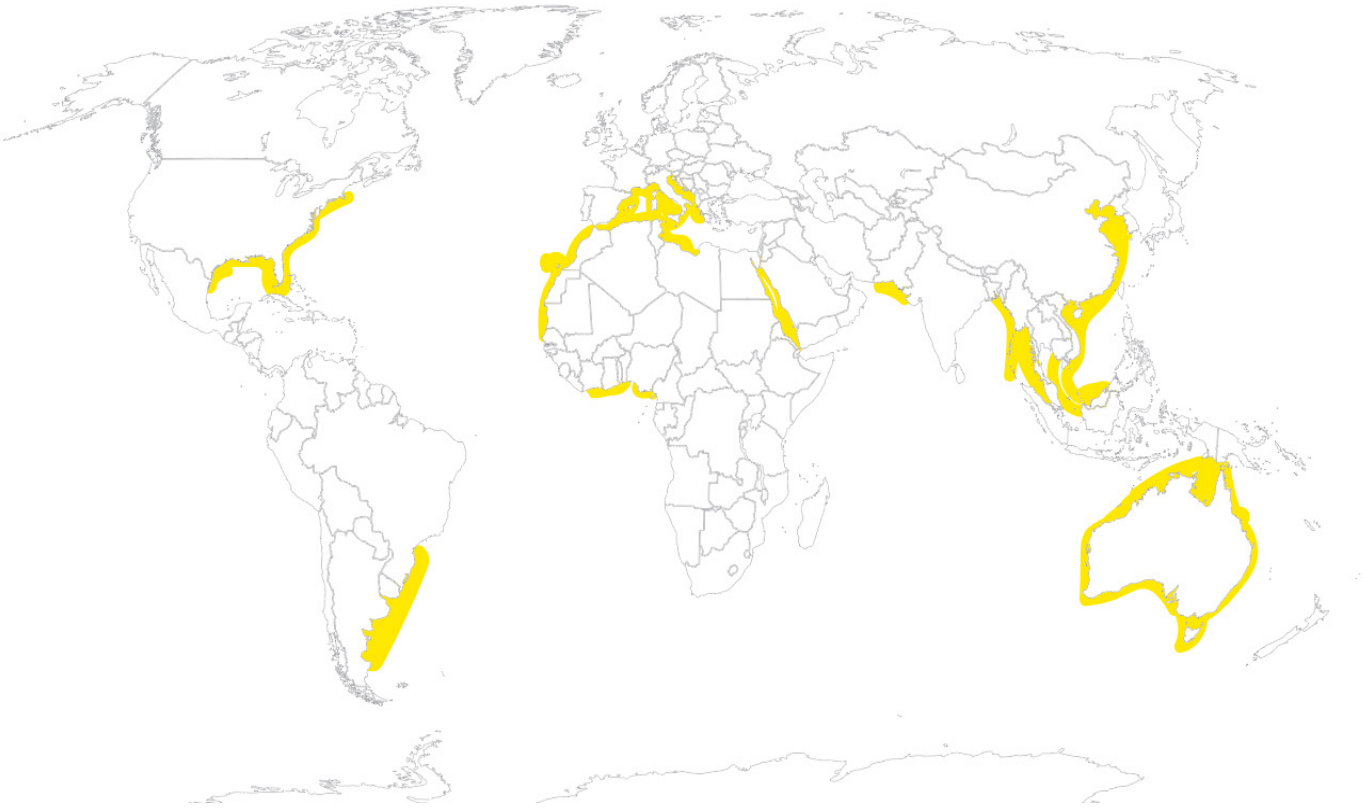
**Conservation Status:** Globally, sand tiger sharks are listed as a Vulnerable Species by the IUCN. In areas of the western Mediterranean, Europe, and the eastern Australian coast, they are considered to be Critically Endangered.

**Regions found:** Sand tiger sharks live in warm and temperate waters around the world, except for the central and eastern Pacific.

**Has the animal's range changed over time?** No, although in some areas the numbers of sand tiger sharks have decreased drastically, causing them to become more spread out. In some areas they are considered locally extinct.

**Did your animal's population change?** Yes, it has decreased.

**Threats:** Overfishing, bycatch, and a low rate of reproduction are all threats contributing to the sand tiger



Historical / Current Range: The range of sand tiger sharks has not changed significantly over time. However, the sand tiger shark population has decreased.

## Task #4
## Sand Tiger Shark Diet

While we think of sharks as the apex predator of the ocean, different sharks have wildly different diets. Some eat large marine mammals, while others eat tiny plankton. At the zoo, our sand tiger sharks eat different types of fish. Students will have a variety of fish to pick from when creating a plan for some of the biggest residents in our aquarium.

### Extension Activity

Students can use the extension on page 46 & 47 to create a diet plan for a second week. Use the charts in the student guide to find the correct amounts of fish for each day. On page 85, students will use the previous information to determine the weight of 1/4 piece of fish, then determine how many pieces of fish equal the total amount given each day.

## Task #5
## Habitat Design

Students are encouraged to design a zoo habitat that satisfies the natural behaviors of sand tiger sharks. Below are a few suggestions.

**Natural Behaviors:** Socializing, hunting, exploring, using electromagnetism, gulping air (above surface), hiding, resting

- While sharks spend most of their time swimming in open waters, including artificial or real rocks, coral, and sand are all critical and enriching elements.
- Dimensions should be mindful of the size of the sand tiger sharks, which average between 6-9 ft. in length and weigh 350 lbs. For one sand tiger shark, a zoo habitat should be at least 125ft. long, 53 ft. wide, and 26 ft. deep.
- Sand tiger sharks often use water currents to circulate oxygen through their gills, especially when resting on the sandy floor. A gentle current and long stretches of open area should be provided.
- Buoyancy, or the ability to remain motionless in the water, is achieved by gulping air from the surface. Therefore, no obstructions should be present.
- Because sharks use electromagnetism to help navigate throughout the ocean, reducing electricity and electric currents is important.
- Sand tiger sharks are capable of target training and target feeding. An area with a space near the surface for aquarists and sharks to train and feed should be included.

# Sand Tiger Shark Diet Extension Activity

Now that you've created the shark's diet for one week, you can make the diet for a second week. Use the charts in the student guide to find the correct amounts for fish each day. Remember, animals love variety! When planning the diet for each sand tiger shark, remember the following:

- Each day, their diet should contain 1,000 -1,300 g of fish.
- Each shark should receive at least 2 types of fish each day.
- Each day should use a different combination of fish.

| Day 1 | Day 2 | Day 3 |
|---|---|---|
| **Total** | **Total** | **Total** |

# Sand Tiger Shark Diet Extension Activity

This week, the sharks are being fed the same amount, but each fish is being cut into quarters. Using this information from the student guide, complete the chart below to show how much a quarter piece of each fish would weigh.

| | | |
|---|---|---|
| 1/4 Mackerel _____ g | 1/4 Salmon _____ g | 1/4 Bonito _____ g |
| 1/4 Blue Runner _____ g | 1/4 Squid _____ g | 1/4 Humboldt Squid _____ g |

Next, create a second week of diets for the sharks, determining how many quarter-sized pieces of fish are needed to equal the amount provided.

| Day 1 | Day 2 | Day 3 |
|---|---|---|
| ____ pieces of Humboldt Squid = 750 g<br><br>___ pieces of Blue Runner = 300 g<br><br>Total Pieces:<br>Total Grams (g): | | |