

SUPERIOR SENSES



In **Sand-Eating Sharks** we follow a young lemon shark, Manoela, who swims and hunts close to shore near Fernanda de Noronha, an island off the coast of Brazil. This protected area serves as a nursery, a shallow area where young sharks spend their first few years, safe from predators and with access to abundant food. This nursery is unusual, though. Manoela must adjust quickly due to the rise and fall of tides, and acquire new hunting techniques as she grows and expands the range she will explore.

PART 1 As we journey along with Manoela, we discover many of the adaptations that have fueled her survival. First, she learns quickly and from the experience of others. Manoela mimics a method used by older sharks for catching parrotfish and follows her peers to the sandy bottom to have her teeth cleaned of parasites. Then there are her exceptional senses — two-thirds of her brain is dedicated to smell, which helps her locate food sources far away. In addition, lemon sharks have excellent hearing, particularly for low frequencies, and a lateral line system of receptors along the length of their bodies that detects changes in water pressure. This combination of senses, called the *acoustico-lateralis system*, work together to help sharks hunt and to keep tabs on their neighbors. Finally, sharks and some rays have a sixth sense known as *electroreception*. Special pores on their head, called *ampullae of Lorenzini*, can detect tiny electric impulses from prey and nearby animals.

1. Choose one of the lemon shark's keen senses or adaptive traits from the following list and research it to learn more. Consider how it benefits both Manoela's survival and the overall ecosystem. Use more paper if you need it.

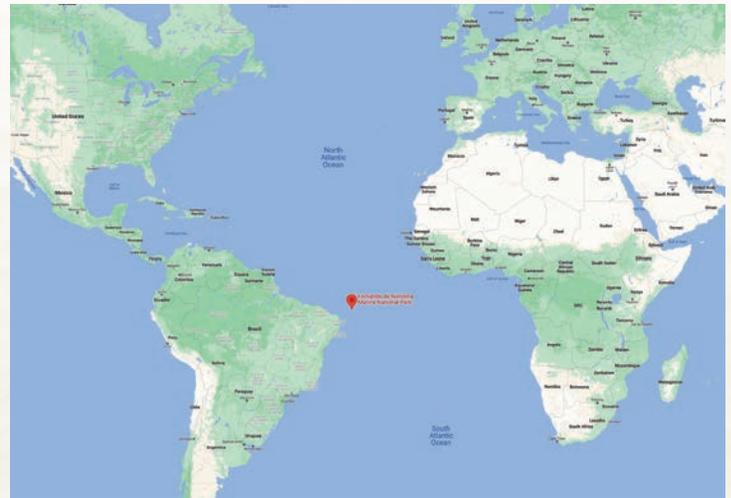
- | | |
|-----------------------------------|-------------------------|
| Acoustico-lateralis system | Electroreception |
| Coastal hunting | Smell |
| Social learning | Teeth cleaning |

Brief description of trait: _____

Advantage for lemon shark: _____

2. How does a successful predator benefit an ecosystem?

3. Now think about some traits that are not as strong in lemon sharks: They are slow swimmers and have mediocre eyesight. What physical features or behaviors do they use to work around these shortcomings?



PART 2 The shallow waters surrounding Fernando de Noronha island in Brazil provide a safe shelter for young lemon sharks and host hundreds of other species, including many that are vulnerable or critically endangered. Sea turtles and many seabirds use the region for nesting and breeding. Use the internet to learn more about what makes this region such an important habitat for these diverse species, and complete the region's profile below.

- Hemisphere: _____
- Ocean: _____
- Nearest Continent(s): _____
- Climate: _____
- Composition and Noteworthy Land Features: _____
- Important Species: _____
- Conservation Efforts: _____