Sanibel Sea School
Course Catalog

Our mission is to improve the ocean's future, one person at a time.

Sea Squirts Courses

Designed for ages 4 to 6

1. Crabs – Creatures with Claws. What has eight walking legs, two claws, and one hard shell…? A crab! Crabs get a bad rep for their tendency to pinch, but these crustaceans are misunderstood. In this course, we'll convince our young explorers that crabs use their claws for much more than pinching and do our best to encounter live crustaceans. Whether digging in the sand to find spider crabs or peeking into a ghost crab burrow, we will leave this class with a newfound love for clawed creatures.

2. Dolphins – A Pod that Plays Together, Stays Together! Dolphins are incredibly playful creatures, and in this course, we will be too! We will learn about dolphin behavior, splash in the waves, and even try to catch fish just like a dolphin would. If we're lucky… we may even get a chance to see a playful pod riding the waves.

3. Sand – We Dig It. There are endless possibilities for fun with sand – building castles, digging for creatures, and burying your toes. But what is sand? And where does it come from? We're going to answer these questions and more in this class. We'll make sand from shells, discover where to find the softest sand and learn about the creatures that call it home.

4. Sea turtles – From Sand to Sea. Hundreds of hatchlings burst out of the sand from nests all summer in a mad dash for the Gulf of Mexico! Join us in this class as we uncover the mysteries of a sea turtle's life cycle. We'll learn where they lay their eggs, attempt to recreate our own nest, and try to make the beach safer for these incredible animals.

5. Sharks – A Toothful Tale! Sharks have thousands of teeth, some with multiple rows. But despite this toothy grin, there's no reason to fear sharks. This class teaches us to love these misunderstood fish and discover which species are nearby. Join us to explore the beach for shark teeth, investigate how sharks move through the water, and discover what differentiates sharks from other fish.

Core Courses

Designed for ages 6 to 13

1. Algae – Photosynthesis Beneath the Waves. Dive into the fascinating world of marine algae, the autotrophs of the sea that play a crucial role in marine ecosystems and the global environment. Often referred to as seaweed, algae come in a mesmerizing array of colors - red, green, and brown. These photosynthetic organisms are the unsung heroes of the ocean, forming the foundation of the marine food web and producing much of the oxygen we breathe. However, when conditions are just right, algae can multiply rapidly, leading to harmful outcomes. In the course, we'll learn to differentiate between macroalgae and identify the unique characteristics of red, green, and brown. We'll examine anatomy as we recognize the holdfast, stipe, blades, and bladders that make up their structures. Join us to discover algae's vital ecological roles, from providing sustenance for marine life to offering protection and camouflage.

2. Barrier Islands – Land Divided by the Sea. Sanibel and Captiva are fascinating barrier islands, from their ancient formation to the intricate tapestry of biological diversity they support. This course comprehensively explains how barrier islands take shape, evolve over time, and distinguish themselves from mainland environments. We will explore what makes Sanibel and Captiva unique and their vibrant conservation history. Equipped with field guides, binoculars, and nature journals, students will traverse the landscape of Sanibel, meandering through estuaries, hammocks, and dunes to witness the island's rich biodiversity up close.

Through lab and field activities, from coastline mapping to building barrier island models, students will build a strong connection to Sanibel and Captiva and understand their impact on the world.

3. Calusa – Evidence of a Lost Culture. Embark on a journey to uncover the mysteries of the Calusa, a remarkable civilization that thrived along the Southwest Florida coast long before the arrival of European settlers. We'll learn about the lives of these seafaring people, exploring their ingenious ways of living off the ocean's bounty. Discover how the Calusa utilized shells to craft tools, weapons, and art, and witness their innovative approach to building elevated homes atop mounds of discarded shells, known as middens. We may even take to the water in canoes similar to those used by the Calusa. Unearth their traditions, spiritual beliefs, and trade networks that spanned the Eastern United States. The Calusa's legacy comes to life in this course, where history and adventure intertwine to reveal the enduring influence of a civilization now vanished from the Florida landscape.

4. Cnidarians – Jellies, Coral, and Anemones Await. Join us to learn about Cnidarians, a group of animals armed with specialized stinging cells called nematocysts. We'll venture into the Gulf's azure waters, snorkels in hand, and uncover the diversity of jellies, coral, and anemones. We'll learn how to identify them, reveal safe-to-handle species, and explore their role within the intricate marine ecosystem. You'll gain a deep understanding of these creatures through captivating hands-on activities, from crafting your own "jelly slime" to observing samples under the microscope. Join us as we unveil the secrets of the mesmerizing world of jellies, coral, and anemones - a voyage that sparks curiosity and wonder.

5. Coconuts – Discover the Wonders of a Drupe. For centuries, civilizations worldwide have relied on coconuts to produce food, drink, fiber, fuel, utensils, musical instruments, and more. But what are these delicious treats? From their humble beginnings as seeds to their roles as food, art supplies, and more, coconuts are true wonders of nature. Join us on our search, from sandy shores to lush picnic spots, as we collect coconuts, dissect them, and even experiment with crafting tools and art from their parts. By the end of the course, you'll know the difference between a nut and a drupe and be equipped to harness the incredible potential of these versatile fruits. Are you ready to go crazy for coconuts? Let the adventure begin!

6. Comb Jellies – Trading Sting for Slime! Ctenophores, or comb jellies, will take center stage as young explorers learn about their unique anatomy, movement patterns, and feeding habits. These translucent creatures are found in almost every body of water worldwide! But no need to fret; although they look like jellyfish, they do not sting. We'll learn how to distinguish between comb jellies and true jellies, explain the function of colloblasts, and even develop snorkeling skills, all while gaining a deeper appreciation for the delicate beauty of these organisms. Did we mention they are bioluminescent?!

7. Crabs – Molting Through Life. From the shores to the deep sea, crabs are iconic ocean dwellers with diverse body types and lifestyles that have evolved in astonishing ways. They have distinctive claws used for defense and feeding and ingenious strategies for attracting mates. We'll investigate the process of molting and how these creatures renew their exoskeletons, take a closer look at their intricate under microscopes, and then venture into the field to find crabs along Sanibel's shores. We'll wade, dig, net, and snorkel our way around the island. Expect crab races and creative use of natural materials to make decapod-inspired art. It's sure to be a claw-raising adventure!

8. Dolphins – Life's Better with Your Pod. Discover the ocean from a dolphin's perspective, unveiling their unique perceptions and social dynamics. Explore their hunting strategies, feeding habits, and the diverse species that call the Gulf of Mexico home. We'll learn about their use of echolocation and unique cognitive abilities. We'll observe dolphin skulls and mammal bones, then head to the beach to fish like a dolphin would. This class is all about fun in the waves; think monofin races, body surfing, and board surfing. We'll gain a deeper appreciation for the conservation of this charismatic megafauna as we explore the threats they face in the wild. Maybe we'll even be lucky enough to encounter a playful pod in the Gulf!

9. Elasmobranchs – Cartilaginous Fish, Not Foe. With a mission to dispel myths and misconceptions, this course focuses on our friends: sharks, skates, and rays. From learning to identify shark teeth to comparing dermal denticles with sandpaper, students will learn about the diverse adaptations, anatomical features, and unique senses that set elasmobranchs apart. We'll highlight their pivotal role in the ocean and their misunderstood nature and explore Sanibel's waters, hoping to observe one in the wild. Creative art projects will foster a deeper appreciation for their unique anatomy. Join us to set the record straight and learn how to protect these magnificent ocean predators.

10. Fish – The Original Backbone. More successful than the dinosaurs and much older than humans, fish are Earth's most diverse group of vertebrate animals. Join us on a journey to the realm of scaly wonders. We'll discover how fish breathe, communicate, and move. A fish dissection, using microscopes to observe scales, and gyotaku are just a few of the exciting activities in this course. You'll develop the skills to identify different fish while refining techniques like seining, cast net throwing, and snorkeling. Encounter the magic of fish behavior firsthand as you observe and record their interactions and even experiment with sensory stimuli. There's nothing better than swimming along with the pioneers of life's backbone – it's sure to be fin-tastic!

11. Freshwater and Gators – Where There's a Baby, There's a Mama. Freshwater can be a limiting factor for land animals and plants living on a barrier island, but Sanibel is blessed with a natural supply. In this course, students will learn to measure salinity using refractometers and explore the concept of keystone species, showcasing one of the wetland's most notorious inhabitants: the American Alligator. Field excursions to Sanibel's picturesque locations, such as Ding Darling and Bailey Tract, offer the chance to observe alligators in their natural habitat and detect signs they leave behind. Students will contribute to wetland restoration discussions and explore the ecosystem services provided by freshwater habitats. We hope to see you later, alligator!

12. Intertidal Zone – Life Between the Tides. The zone between the shore and the ocean is biologically rich and environmentally challenging. Let's journey where the ocean's ebb and flow create the incredible intertidal zone! We'll discover unique habitats exposed at low tide, use microscopes to observe sand samples and sink deep into stinky mangrove mud. Young scientists will learn to use transects to answer questions about species diversity and habitat variation. Carefully scheduled only at low tide, this course will be so much better than your average beach trip.

13. Horseshoe Crabs – Our Link to Prehistoric Days. Horseshoe crabs have been crawling along ocean floors for over 500 million years, long before the dinosaurs were around. Join us to discover why they are more closely related to scorpions and spiders than crabs and embark on a quest to spot one scurrying by. We'll experiment with vision to understand their peculiar adaptions, explore the intertidal zone, and contribute to ongoing research. You won't want to miss out on this expedition to find Earth's living fossils!

14. Manatees – Mermaids Among Us. Historically mistaken for mermaids, hence their Latin name *Sirenia*, manatees are iconic marine mammals. These gentle giants grace us with their presence in coastal habitats where they can munch on plenty of seagrass, algae, and mangrove leaves. This course will focus on their misunderstood biology, unique behavior, and conservation challenges. We'll experiment with "blubber" to understand their vulnerability to cold temperatures and closely examine a manatee's skull, including its unique molars. Exploring their habitat, using snorkeling techniques to understand buoyancy, and even seining to catch seagrass bed inhabitants will offer students a firsthand experience of the manatee's world.

15. Mangroves – Trees that Feed the Sea. Red, red, pointy head; black, black, salt on back; white, white, bolts on tight! These rhymes help spot and identify red, black, and white mangroves in Florida. These salt-adapted trees capture much of the energy that drives marine communities and provide habitat to many creatures. In this course, we'll investigate this muddy habitat, discovering mangroves' specialized adaptations. Get ready to sink into the stinky mud, snorkel near the roots, and lay down with the fiddler crabs! We'll examine their critical role in coastal resilience, erosion prevention, and nurturing marine life to develop a clear understanding of the interconnectedness between mangroves and the broader ecosystem. From invertebrates

and reptiles to birds and marine mammals, the course highlights the rich biodiversity that relies on mangroves for sustenance and shelter. Low tide is calling. Mangroves, here we come!

16. Marine Worms – A Benthic Adventure. Marine worms are elusive invertebrates that live just beneath the sand in marine environments all over the world. In this class, we'll learn about three common worms that inhabit the benthic zone here in Southwest Florida. We'll discuss how they feed, protect themselves, and discover the unique clues they leave behind that key us in on where they're hiding. Join us as we set out to uncover the wonders of worms for a wiggly, slimy, benthic adventure!

17. Navigation – Finding Your Way. For thousands of years, explorers have been using navigation techniques to find their way around the globe. In this class, we'll learn how to use a compass, make and read maps, and even dip into the water to understand how sea creatures navigate the big blue. One can never be lost when equipped with the tools to navigate – join us to learn how to find your way.

18. Ospreys – Master Fishermen of the Sky. Ospreys are renowned for their exceptional fishing skills. In this course, students will witness these incredible hunters as they spot their prey from above and make breathtaking dives to catch fish with their specialized talons. From identifying Ospreys correctly to understanding their unique diet, mating habits, and nesting techniques, students will gain a deep appreciation for these avian wonders. Additionally, they'll learn practical skills such as proper binocular use and microscopy. And we can't learn about Ospreys today without a look at the past. We'll explore their conservation success story, highlighting how these birds overcame endangerment. Join us in observing Osprey feathers, examining bird bones, and playing bioaccumulation games to learn about environmental interactions. Let's dive in!

19. Pelicans – Wings Over Water. "The magnificent bird, the pelican – its beak can hold more than its belly can!" Pelicans are emblematic members of our local marine community. Students will learn about the unique adaptations and behaviors of both Brown and White Pelicans, comparing their hunting methods and migration patterns. We'll examine Pelican feathers and bones, use nets to model hunting methods and observe them in the field. Grab your binoculars and join us to search the shores for our feathered friends.

20. Plankton – Adrift at Sea. Plankton were named the 'drifting creatures' long before we learned about their complex swimming behaviors. These are the plants and animals that, in many ways, support all life on our planet. We'll learn about plankton, collect it in specialized nets, and identify it with microscopes in the lab. We promise you will never look at a drop of water quite the same way again.

21. Seagrass – There are Flowers Under the Sea? Join us on an underwater adventure to discover the hidden wonders of seagrass meadows. The estuaries of Southwest Florida support rich seagrass communities, and in this course, young explorers will learn about their importance to our oceans and marine life. We'll uncover the incredible creatures that call seagrass home and even get hands-on experience with interactive activities like seining and snorkeling. You never know what we'll find – seagrass has a way of surprising us!

22. Seahorses – The Ultimate Mr. Mom. Famous for their role reversal in reproduction, seahorses are arguably the coolest fish on the planet –ask any mom. Seahorses are also masters of disguise, camouflaging themselves in our local seagrass beds. We explore their habitats and learn about their voracious appetites. And who knows, we might find a pregnant male!

23. Seashells – Sally Sells Them, but Who Makes Them? Sanibel Island is a shelling paradise, with hundreds of species waiting to be discovered. But who made these mysterious works of art, and why are there so many shells on our beaches? Join us in this course to find answers to these questions and more. We'll comb the beaches in search of the most coveted shells, learn the names of a few, and dip beneath the sand to find the creatures that create them. We can't guarantee you'll find a Junonia, but we promise you won't leave empty-handed!

24. Sea Turtles – From Eggs to the Deep Blue. In this class, students will explore the lives of majestic sea turtles, possibly spotting the tracks left by females on their way to the nest, depending on the season. Learn

about the seven sea turtle species, their nesting habits, and their challenges. By the end of the course, students will identify sea turtle nests, create art projects from natural materials, understand reptiles, and even get hands-on experience with sea turtle bones.

25. Shorebirds – The Real Peeps. Have you ever watched those little guys playing tag with the waves, darting to and from the water's edge, yet never seem to get wet? Shorebirds are conspicuous members of the beach ecosystem, but who are they, and what do they do? We examine the physical aspects of these birds to see how they avoid directly competing with one another. We also explore their impressive feats of migration, as Sanibel is graced with shorebirds from around the world during different times of the year.

26. Shrimp – Perch, Swim, Flick! Shrimp have two claws for feeding, three legs for walking or perching, and five swimmerets –a whopping ten joined appendages! But locomotion doesn't stop there; these crazy crustaceans can also flick their tail to move backward for a quick escape! In this class, we'll explore the adaptations of shrimp, determine their habitats, and spot local species. Best part? We'll solve the mystery behind the "snap, crackle, pop" heard when one dips beneath the surface…

27. Squid and Octopus – Naked Mollusks. Close relatives to snails and clams, these animals either have a shell inside their body or have no shell at all. Squid and octopus are perhaps the most intelligent invertebrate animals, and although we can never be assured of finding one, we go on an octopus hunt, immersing ourselves in their likely haunts. We also explore the anatomy and behavior of these wonderful marine creatures through a squid dissection.

28. Symbiosis – Peace, Love, and Symbiosis. Symbiotic relationships are fundamental to the health and balance of ecosystems. Symbiosis is the interaction between organisms, and this class delves into the different types of symbiotic relationships and their effects on the environment. From mutualism, where both parties benefit, to commensalism, where one benefits without harming the other, and parasitism, where one benefits at the other's expense, we'll uncover the intricate dynamics of these interactions. Symbiotic relationships surround us - you just have to know where to look!

29. Urchins, Dollars, and Stars, Oh My. The spiny-skinned creatures, echinoderms, are the only major group of animals that live totally in the ocean. In this course, students will embark on an immersive journey to uncover the unique traits and roles played by sea stars, sea urchins, and sand dollars within marine ecosystems. Through engaging activities, such as microscope exploration, tank observations, and beach walks, participants will gain an up-close understanding of anatomy and behavior. Projects like creating echinoderm prints, making sea star window clings, and building clay sand dollars will enable students to express their creativity while reinforcing their knowledge. With fun games like Echinoderm Tag, they'll learn about the intriguing ability of echinoderms, like sea stars, to regenerate lost body parts.

30. Wading Birds – Birds on Stilts. Discover the incredible diversity of wading birds as they gracefully stalk their prey on long legs in Sanibel's rich wetland habitats. Students will learn about wading birds' adaptations, behaviors, and conservation needs through engaging activities. Get hands-on with bird beak experiments, observe wading bird tracks, improve your nature journaling skills, and even try your hand at casting a net to catch fish! White Ibises, Snowy Egrets, Great Blue Herons, and Tricolored Herons are just a few that we may spot.

31. Waves – The Motion of the Ocean. Whether you're a wave enthusiast, a beachgoer, or a budding surfer, this course has something for everyone. It explores the origins and characteristics of waves, emphasizing that most waves are born from the caress of the wind over the water's surface, a process where wind energy transforms into mechanical energy, propelling the water into an elegant dance of motion. You'll learn how factors like wind speed, duration, and fetch influence wave size and witness the magic of wave interactions with the ocean floor, which can shape coastlines and the unique communities living along the littoral zone. From creating waves to feeling the ocean's rhythm and even learning to surf, this course will surely be an adventure. Catch a wave with us!

32. Zones of the Beach – The Swash, Wrack, and Dunes Story. Delving into the intricate ecology of the beach, this course explores three distinct zones: the swash zone where waves break and sediment exchange occurs, the wrack line marked by debris from high tides and a transitional haven for various creatures, and the protective dunes that guard the shore against the relentless ocean. We'll identify unique plants and animals in each zone, build microscopy skills, and even express your newfound knowledge through creative art projects using natural materials. You will gain a deeper understanding of these vital coastal ecosystems and discover the environmental challenges they face.

Marine Masters: Teen Courses

Designed for ages 13 and up.

1. Bathymetry – Exploring the Underwater Unknown. Vast open spaces still exist for humans to explore. Although most think of outer space first, only a tiny fraction of the ocean has been investigated. In this class, we will discover the features found at the bottom of the ocean and the challenges scientists face with deep-sea exploration. We'll learn how to map the ocean floor and find unique creatures that call it home.

2. Fiddler Crabs – Claws for Courtship. Male fiddler crabs are adorned with a huge claw. This claw is mainly used for communication and to attract a mate. Fiddler crabs live on still, calm shorelines and are a fun part of the marine fauna of Southwest Florida. We explore their habitat and marvel at the sheer tonnage of mud they clean up for the estuary.

3. Mollusks – You call that a foot?! Over 85,000 different known species of these soft-bodied creatures can be found all over our planet! Some shelled and some shell-less. But how did these creatures evolve to live in almost any environment on our planet? We go inside (literally) the world of some of the most intelligent creatures in the sea and explore what makes them move, eat, and exist!

4. So, You Want to be a Biologist? Biologists study life. Their role in monitoring wildlife on Earth is critical to conservation and policy change. Life as a biologist is not always easy – here in SW Florida, it often involves being dirty, sweaty, and hot! But it's all worth it to interact with and observe Sanibel's incredible wildlife. Join us to learn more about what it takes to be a biologist and try out techniques and tools professionals use.

5. Waves – Energy in Motion! Waves are all around us - from sea to sound. In this course, we'll explore the physics of waves and how they're formed in the ocean. We'll grab our mask and snorkel to dip beneath the surface and catch a glimpse of how sand shifts from the motion of the ocean. We'll learn how waves are measured and maybe even catch a ride on one!

sanibel®
sea school