

The Magic of the Tides

How the Moon, Sun, and Sea Shape Life on
the Outer Banks



Outer Banks, North Carolina

Forward

This storybook was created by the Outer Banks Coastal Conservation (OBCC), a nonprofit organization whose mission is to foster environmental stewardship and a deeper connection to the Outer Banks of North Carolina through outreach, education, and conservation efforts.

We believe that small stories can spark big change. That is why we have made this book available as a free resource for parents, teachers, and community members.

All materials in this book may be freely downloaded, shared, printed and used for educational or nonprofit purposes.

To learn more, access additional resources at: www.theobcc.org.



A Curious Hatchling

One bright morning on the Outer Banks, Luna the Little Loggerhead Turtle poked her head from her sandy nest.

The ocean sparkled in front of her, rolling and rumbling like a sleepy giant.

But as she watched, something strange happened.
The waves crept close... then slowly slipped away.

“The water moves all by itself!” said Luna. “Why does it do that?”



Meeting Percy the Pelican

Up above, Percy the Pelican circled the dunes and landed beside her.

“You’ve just noticed one of the ocean’s greatest rhythms,” he said. “They’re called *tides*.”

“Tides?” asked Luna.

“Yes,” said Percy. “Tides are the ocean’s rise and fall — like breathing in and out. They’re caused by the pull of the Moon’s gravity on the ocean.”

“The Moon?” Luna tilted her head. “But it’s way up in the sky!”

Percy chuckled. “It may look far away, but even from up there, the Moon tugs gently on all the water on Earth — and that tiny pull is strong enough to move the sea.”



How the Moon Moves the Sea

That night, Percy pointed to the glowing Moon.

“See how it shines over the waves? Wherever the Moon is, the ocean bulges toward it — that’s *high tide*.”

“On the opposite side of the Earth,” he continued, “another high tide happens because of how Earth and the Moon pull on each other.

In between those two bulges, the water level is lower — *low tide*.”

“So there are two high tides and two low tides each day?” asked Luna.

“Exactly,” said Percy. “Here on the Outer Banks, the tides shift about every six hours and twelve minutes, and they come about 50 minutes later each day as the Moon moves around Earth.”



The Moon and the Sun Team Up

Percy showed Luna a drawing scratched in the sand.

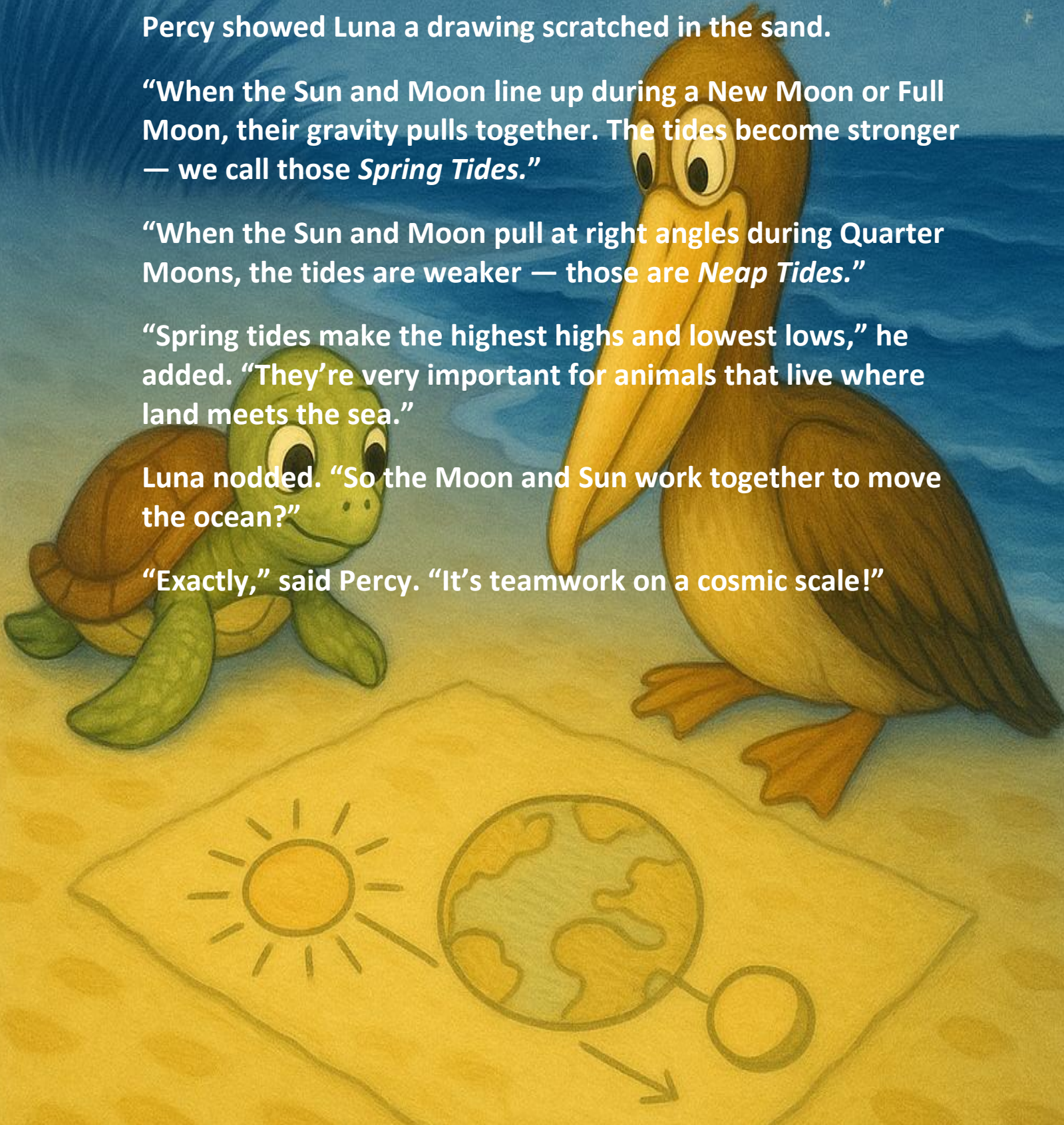
“When the Sun and Moon line up during a New Moon or Full Moon, their gravity pulls together. The tides become stronger — we call those *Spring Tides*.”

“When the Sun and Moon pull at right angles during Quarter Moons, the tides are weaker — those are *Neap Tides*.”

“Spring tides make the highest highs and lowest lows,” he added. “They’re very important for animals that live where land meets the sea.”

Luna nodded. “So the Moon and Sun work together to move the ocean?”

“Exactly,” said Percy. “It’s teamwork on a cosmic scale!”



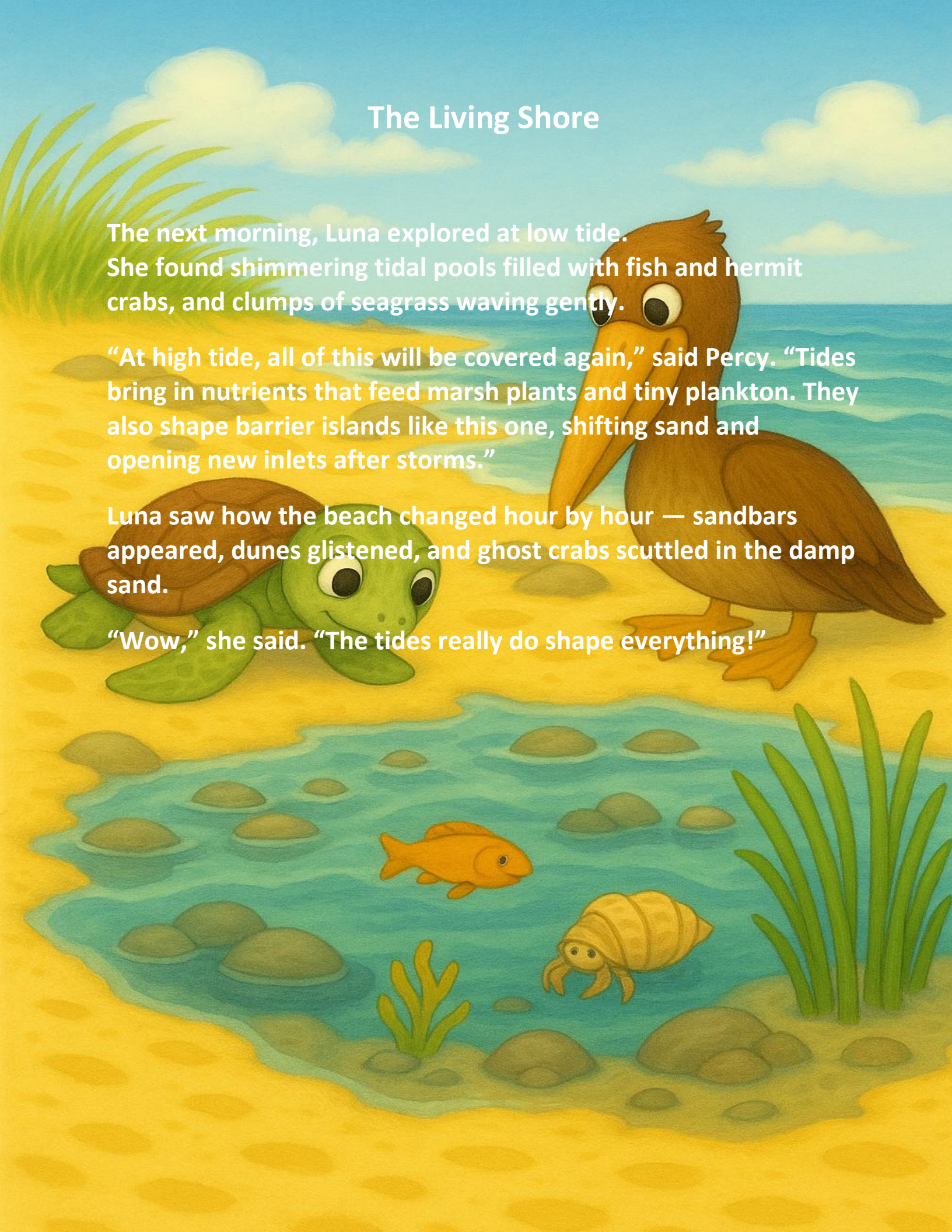
The Living Shore

The next morning, Luna explored at low tide. She found shimmering tidal pools filled with fish and hermit crabs, and clumps of seagrass waving gently.

“At high tide, all of this will be covered again,” said Percy. “Tides bring in nutrients that feed marsh plants and tiny plankton. They also shape barrier islands like this one, shifting sand and opening new inlets after storms.”

Luna saw how the beach changed hour by hour — sandbars appeared, dunes glistened, and ghost crabs scuttled in the damp sand.

“Wow,” she said. “The tides really do shape everything!”



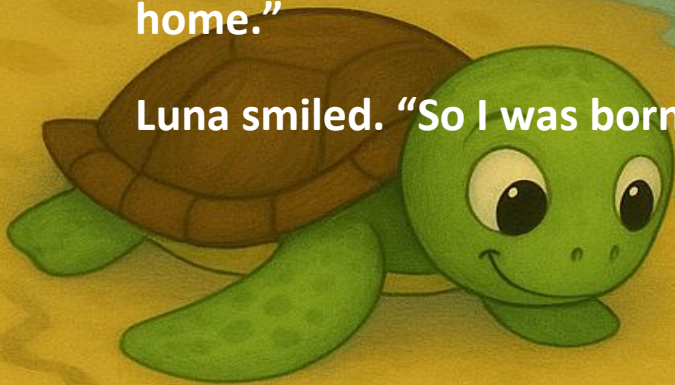
Tides and Turtle Life

As they watched the waves, Luna asked, “Do the tides help turtles too?”

Percy nodded. “Oh yes. Female sea turtles often crawl ashore to nest during high tides near full or new moons. Those tides help them reach the dunes more easily — and return to the water before sunrise.”

He continued, “Weeks later, when the hatchlings emerge, many wait for dark nights to crawl to the sea. They follow the moonlight’s reflection on the water — their natural guide home.”

Luna smiled. “So I was born at the perfect time!”



The Moonlight Lesson

That night, Luna and Percy stood under the glowing moon.

“The Moon’s pull shapes the ocean,” Percy said softly, “and the ocean shapes the shore. Everything — the dunes, the crabs, the turtles, the marshes — moves to that same rhythm.”

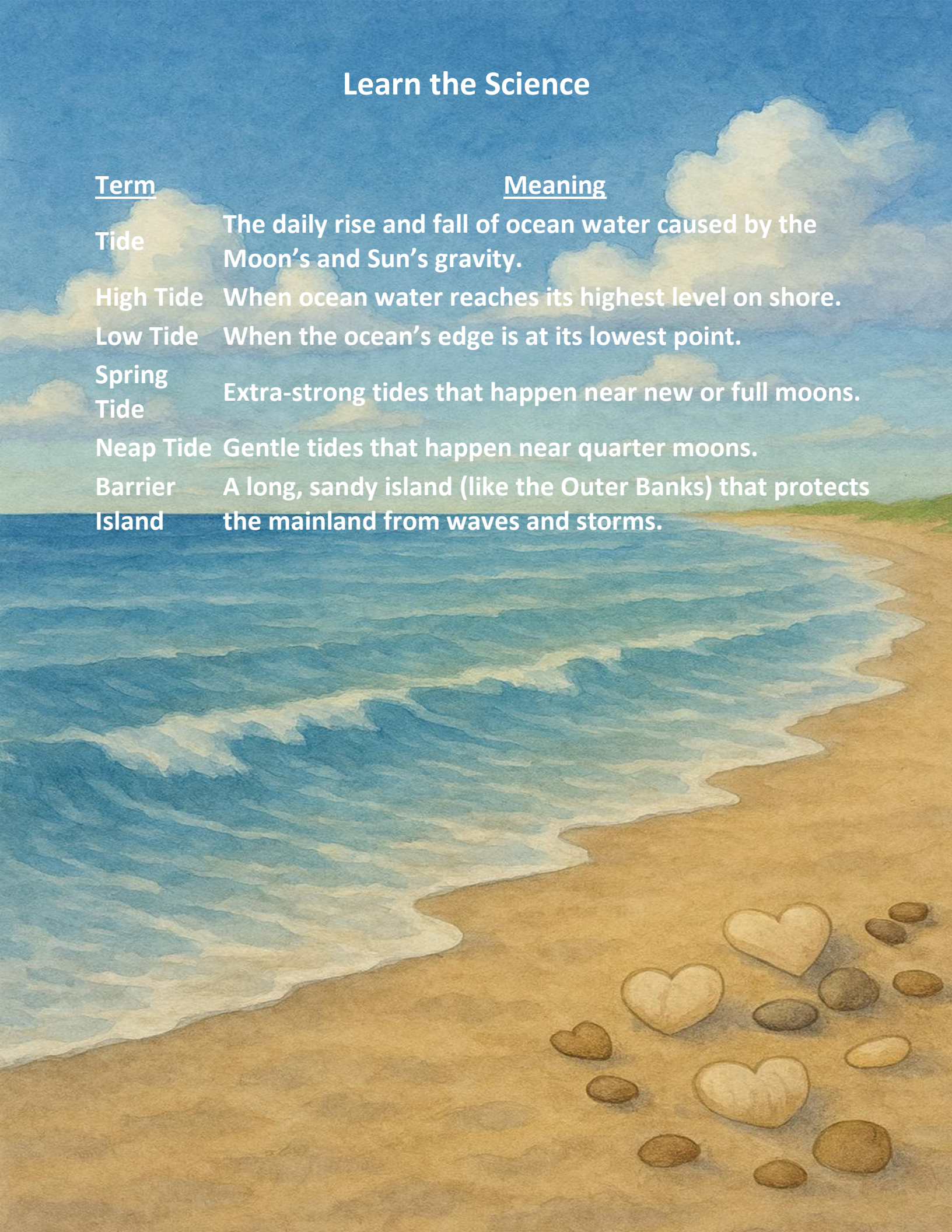
Luna listened to the waves breathe in and out, in and out.

“I’ll never look at the ocean the same way again,” she said.

Percy smiled. “That’s the first lesson of the coast — everything is connected.”



Learn the Science

The background of the page is a watercolor illustration of a beach. In the foreground, there is a sandy beach with several smooth, heart-shaped stones scattered on it. The ocean waves are depicted in various shades of blue and green, with white foam at the base of the waves. The sky is a deep blue with a few white, fluffy clouds. The overall style is soft and artistic.

<u>Term</u>	<u>Meaning</u>
Tide	The daily rise and fall of ocean water caused by the Moon's and Sun's gravity.
High Tide	When ocean water reaches its highest level on shore.
Low Tide	When the ocean's edge is at its lowest point.
Spring Tide	Extra-strong tides that happen near new or full moons.
Neap Tide	Gentle tides that happen near quarter moons.
Barrier Island	A long, sandy island (like the Outer Banks) that protects the mainland from waves and storms.



Coastal Reflection

“The Moon pulls the sea,
the sea shapes the sand,
and the sand shelters life.
Every tide tells a story —
of balance, beauty, and change.”
— Outer Banks Coastal Conservation

References

American Meteorological Society. (2023). *Tides and tidal currents*. Glossary of Meteorology. Retrieved from <https://glossary.ametsoc.org>

National Aeronautics and Space Administration (NASA). (2024). *Tides: The ocean's rhythmic movement*. Earth Science Division. Retrieved from <https://earthobservatory.nasa.gov>

National Oceanic and Atmospheric Administration (NOAA). (2023). *What causes tides?* National Ocean Service. U.S. Department of Commerce. Retrieved from <https://oceanservice.noaa.gov>

National Park Service. (2023). *Coastal dynamics and the role of tides in shaping barrier islands*. Cape Hatteras National Seashore. U.S. Department of the Interior. Retrieved from <https://www.nps.gov/caha>

North Carolina Department of Environmental Quality. (2022). *Coastal habitat protection plan update: Beaches, dunes, and tidal habitats*. Division of Marine Fisheries. Retrieved from <https://deq.nc.gov>

Pugh, D. T., & Woodworth, P. L. (2014). *Sea-level science: Understanding tides, surges, tsunamis and mean sea-level changes*. Cambridge University Press. <https://doi.org/10.1017/CBO9781139235778>

U.S. Geological Survey (USGS). (2023). *Barrier islands and coastal change: How tides and storms shape the Outer Banks*. Retrieved from <https://www.usgs.gov>