

Sea Oats School

SCIENCE LESSON

The Beach

A Living Ecosystem



Outer Banks, North Carolina

Sea Oats School Science Lesson: The Beach: A Living Ecosystem

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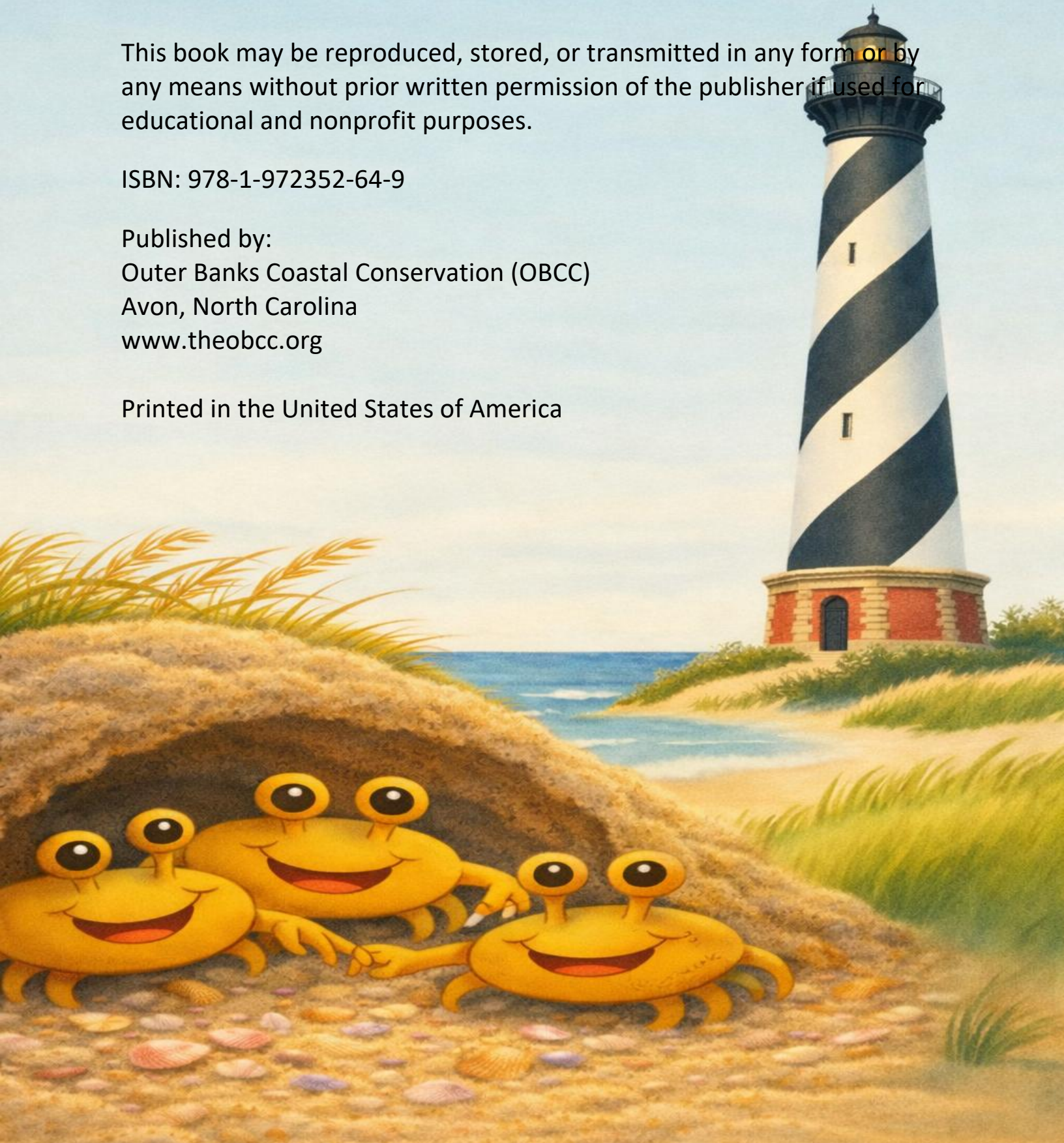
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About This Book

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.



Sandy, Scoot, and Shellby Dunehopper *loved* learning.

At home, they were always reading science books, exploring on their computers, and asking questions about the world around them.

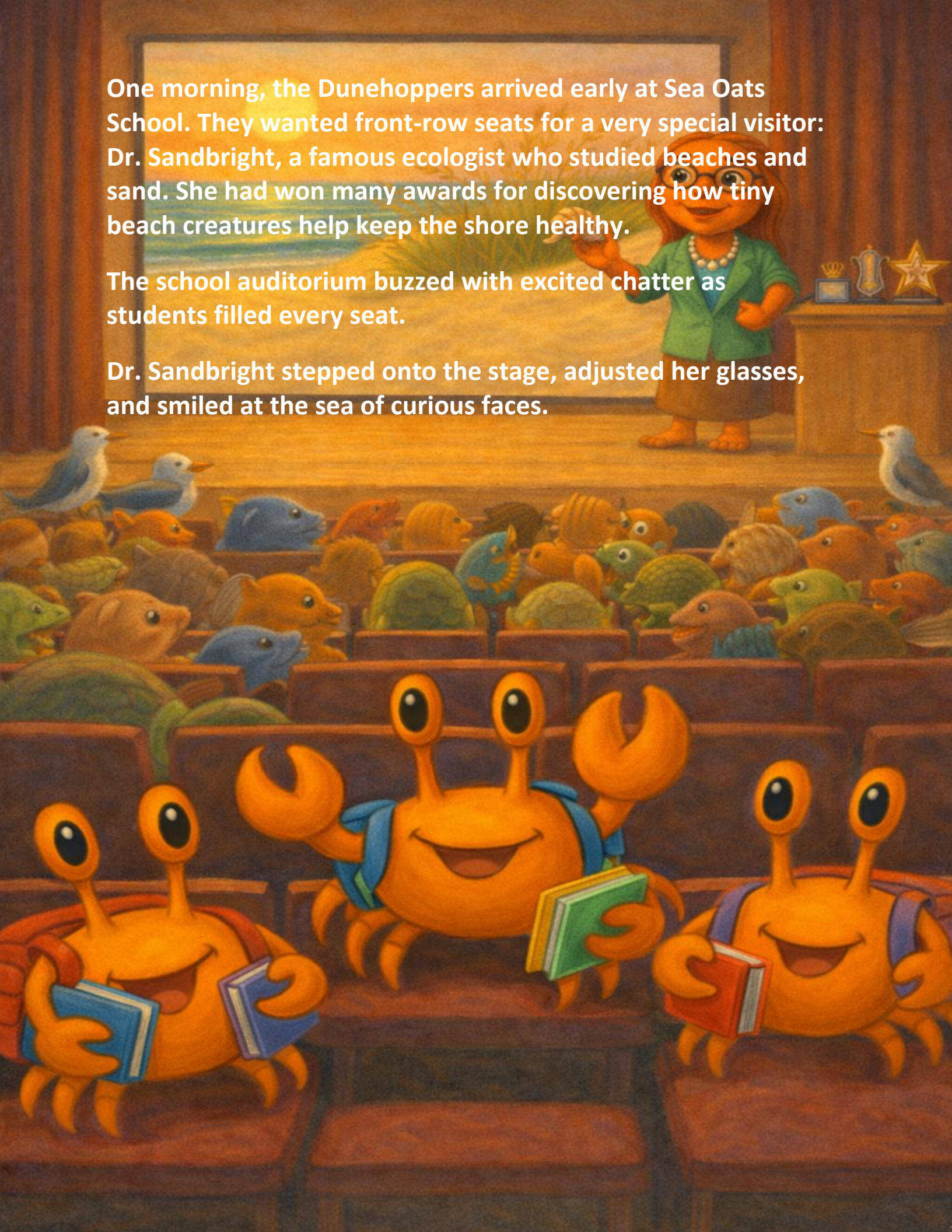
But most of all, they were curious about their sandy home—and all the creatures who lived beneath their claws.



One morning, the Dunehoppers arrived early at Sea Oats School. They wanted front-row seats for a very special visitor: Dr. Sandbright, a famous ecologist who studied beaches and sand. She had won many awards for discovering how tiny beach creatures help keep the shore healthy.

The school auditorium buzzed with excited chatter as students filled every seat.

Dr. Sandbright stepped onto the stage, adjusted her glasses, and smiled at the sea of curious faces.



“Good morning, Sea Oats School!” she said brightly.

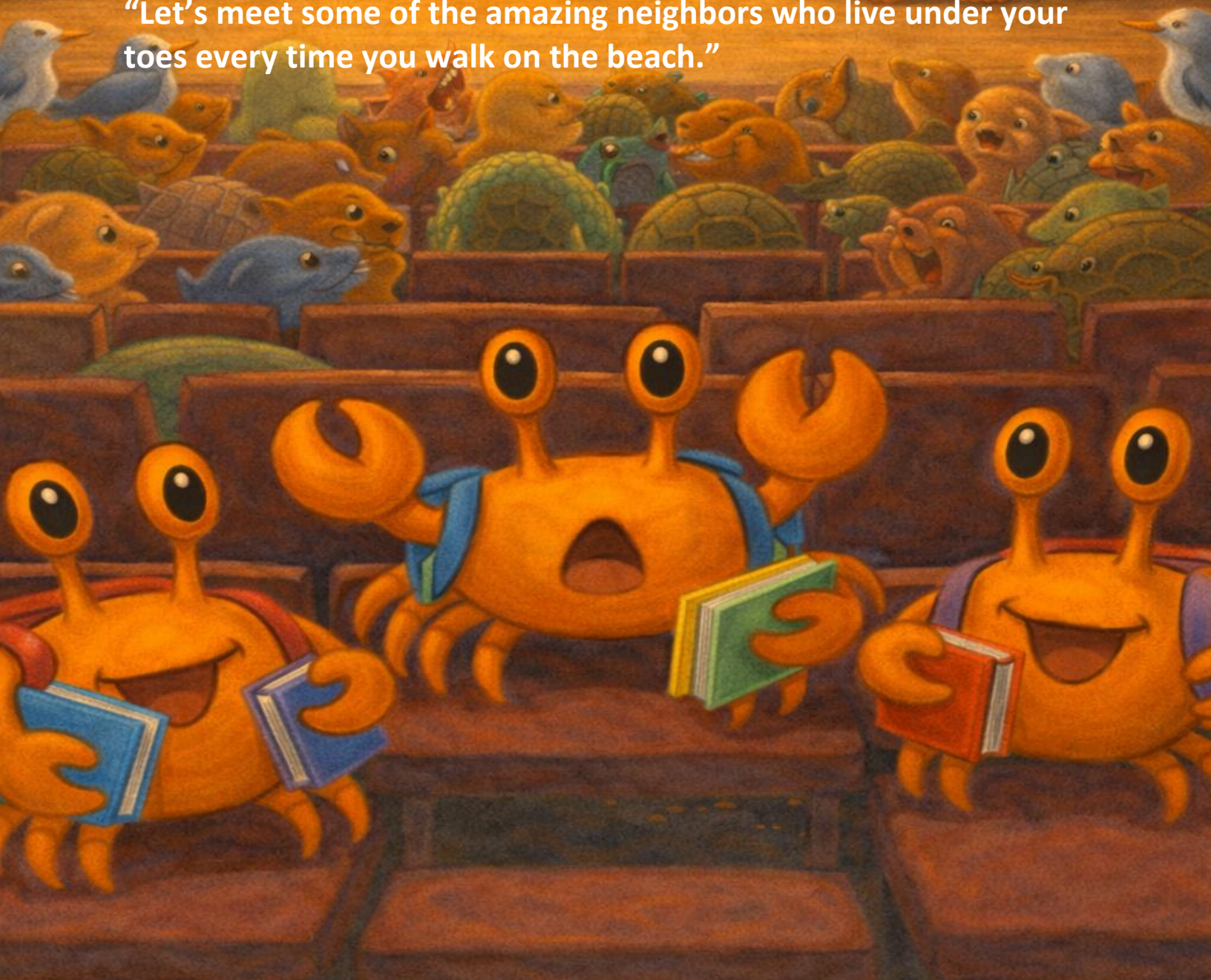
“Today, I’m going to let you in on a secret.”

The room grew quiet.

“The beach may look calm and quiet,” she said, “but under the sand is a *very busy neighborhood!* On barrier islands like the Outer Banks, the sand is alive with helpers. Some are so tiny you need a microscope to see them, and some come out only at night—but every one of them helps keep the beach healthy.”

The class gasped.

“Let’s meet some of the amazing neighbors who live under your toes every time you walk on the beach.”



1. Tiny Clean-Up Helpers (Microbes)

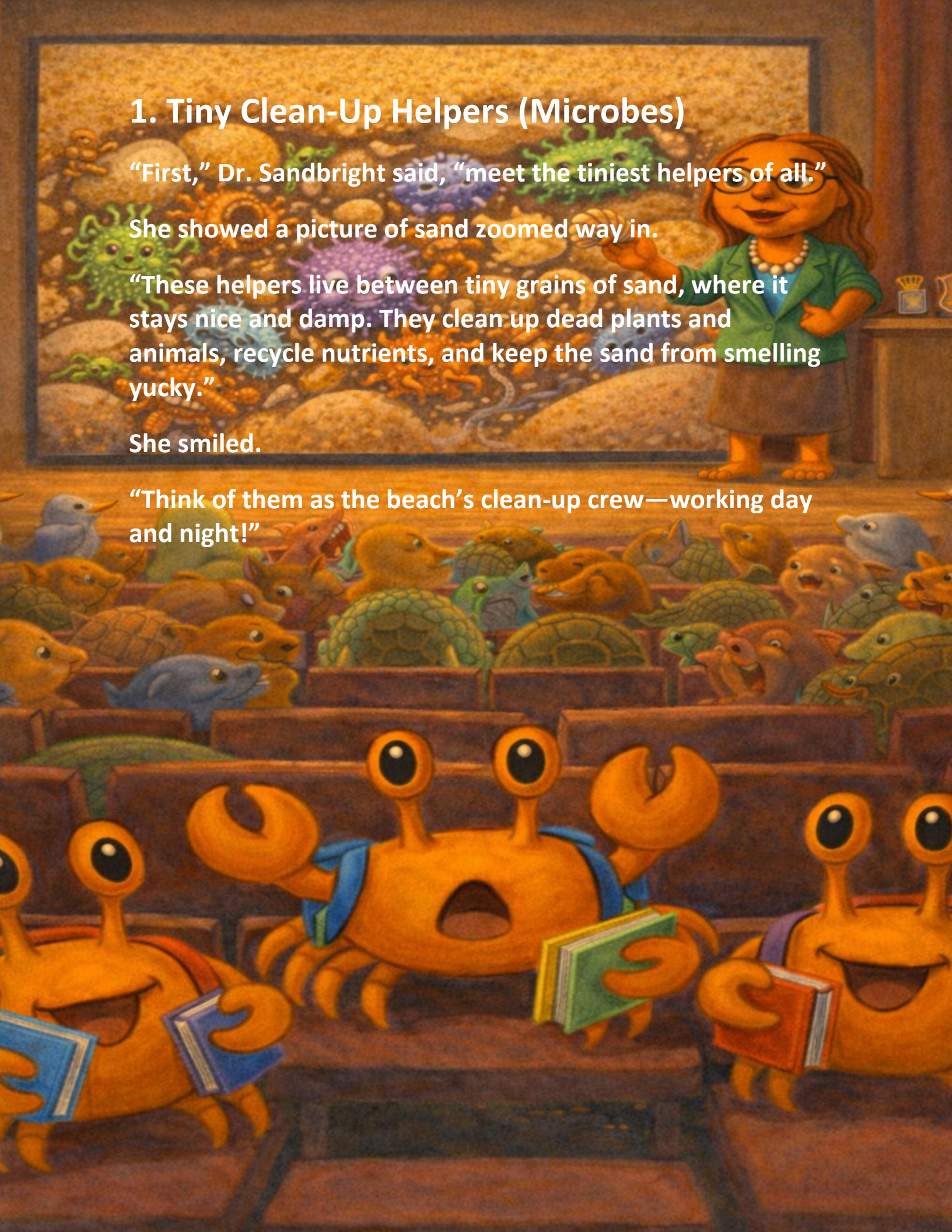
“First,” Dr. Sandbright said, “meet the tiniest helpers of all.”

She showed a picture of sand zoomed way in.

“These helpers live between tiny grains of sand, where it stays nice and damp. They clean up dead plants and animals, recycle nutrients, and keep the sand from smelling yucky.”

She smiled.

“Think of them as the beach’s clean-up crew—working day and night!”



2. Wiggly Sand Worms

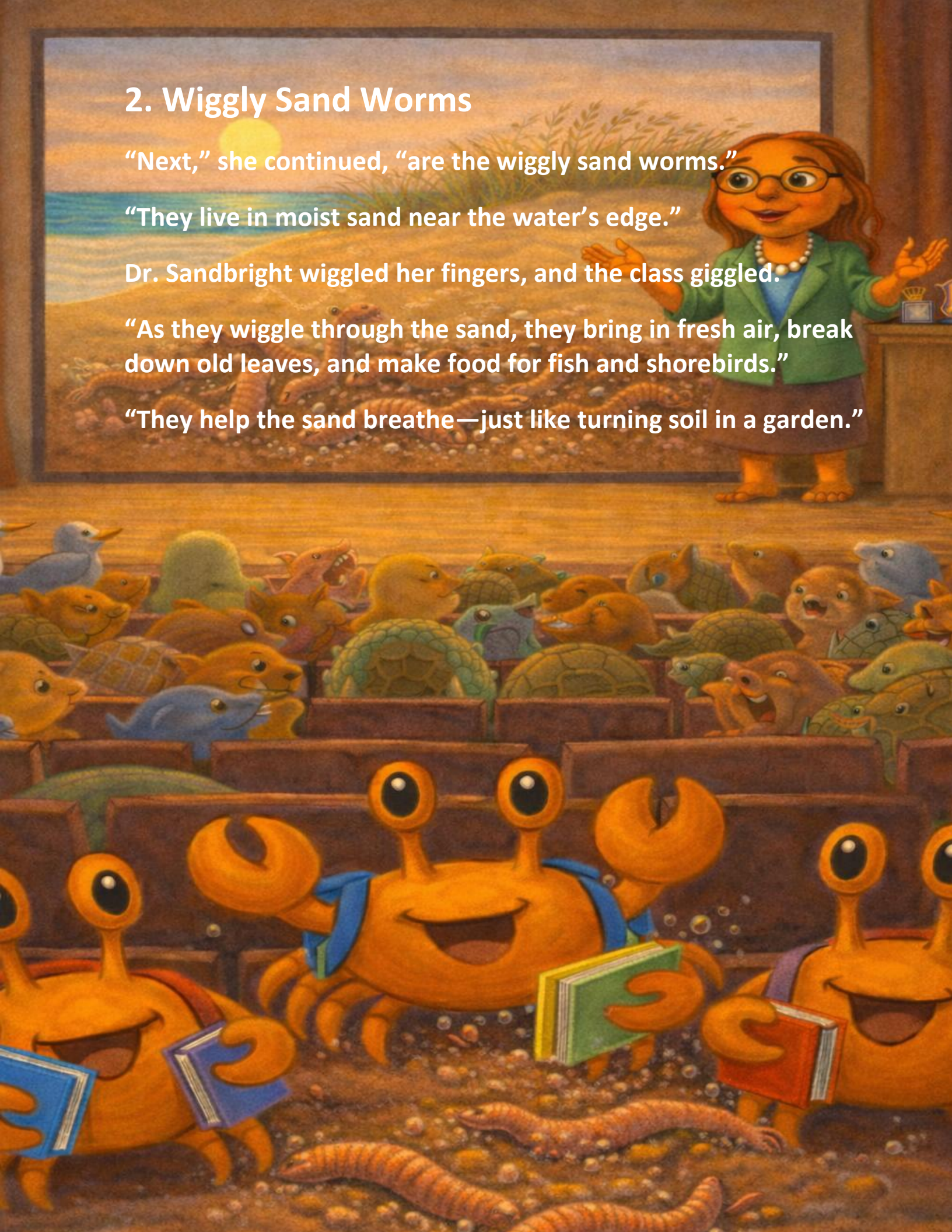
“Next,” she continued, “are the wiggly sand worms.”

“They live in moist sand near the water’s edge.”

Dr. Sandbright wiggled her fingers, and the class giggled.

“As they wiggle through the sand, they bring in fresh air, break down old leaves, and make food for fish and shorebirds.”

“They help the sand breathe—just like turning soil in a garden.”



3. Ghost Crabs

“Who has seen ghost crabs before?” Dr. Sandbright asked.

Sandy, Scoot, and Shellby shot their claws into the air.

“We’re ghost crabs!” they said proudly.

“We live in burrows above the high tide line and mostly come out at night!”

“We eat leftovers and dead plants, help keep the beach clean, and dig tunnels that let air into the sand,” Shellby added.

Scoot grinned.

“I especially like leftover french fries.”

The class laughed.

Dr. Sandbright nodded seriously.

“When we see ghost crabs, it’s a sign the beach is healthy and happy.”



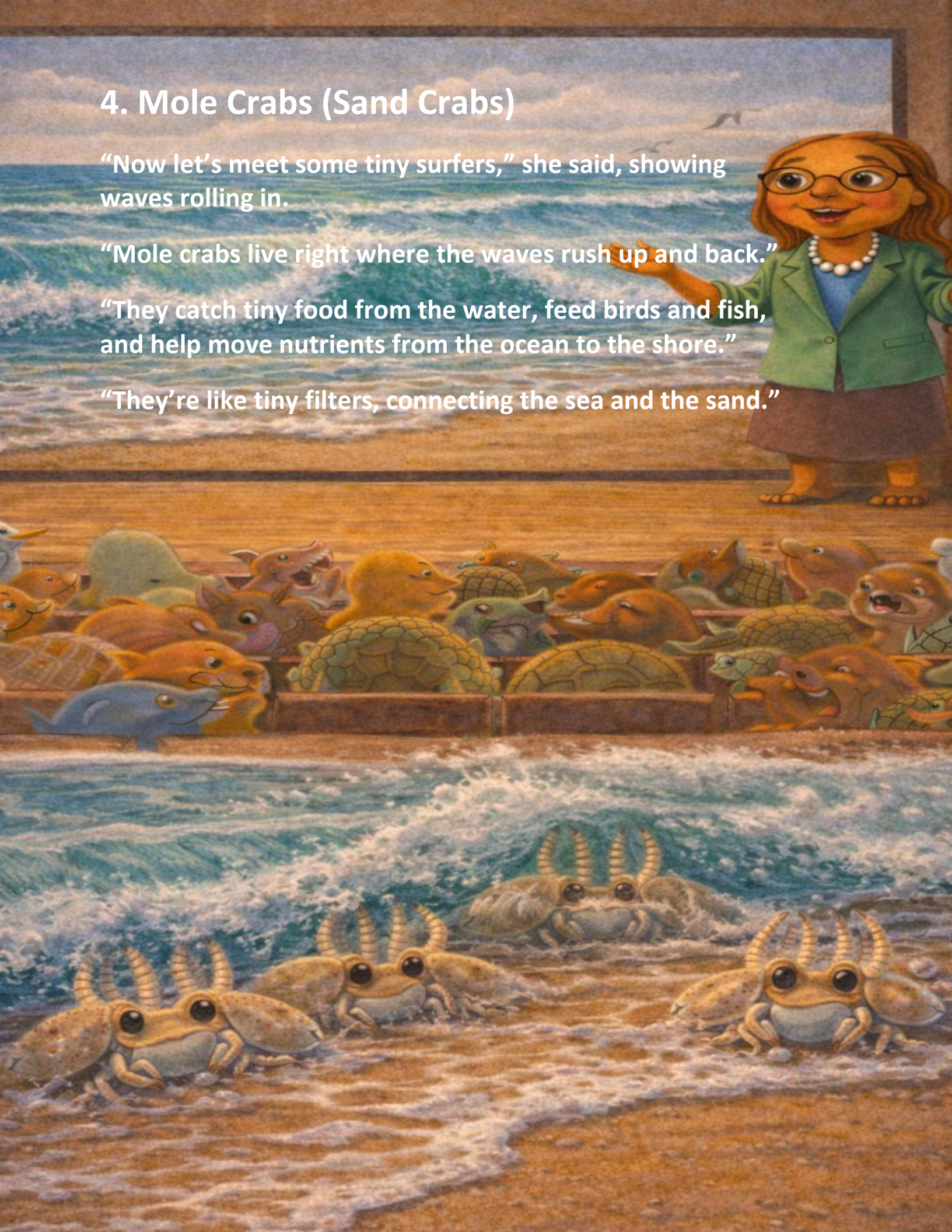
4. Mole Crabs (Sand Crabs)

“Now let’s meet some tiny surfers,” she said, showing waves rolling in.

“Mole crabs live right where the waves rush up and back.”

“They catch tiny food from the water, feed birds and fish, and help move nutrients from the ocean to the shore.”

“They’re like tiny filters, connecting the sea and the sand.”



5. Clams & Coquina

“Just under the sand where waves roll in,” Dr. Sandbright continued, “live clams and coquina.”

“They filter the water to keep it cleaner, help hold sand in place, and feed birds and fish.”

“These shellfish help keep near-shore waters clear and healthy.”



6. Tiny Beach Bugs

“Under seaweed and damp sand live tiny beach bugs called amphipods and isopods.” “They break down seaweed, turn old plants into food, and help feed birds and fish.” Dr. Sandbright smiled warmly. “They turn old stuff into new life.”



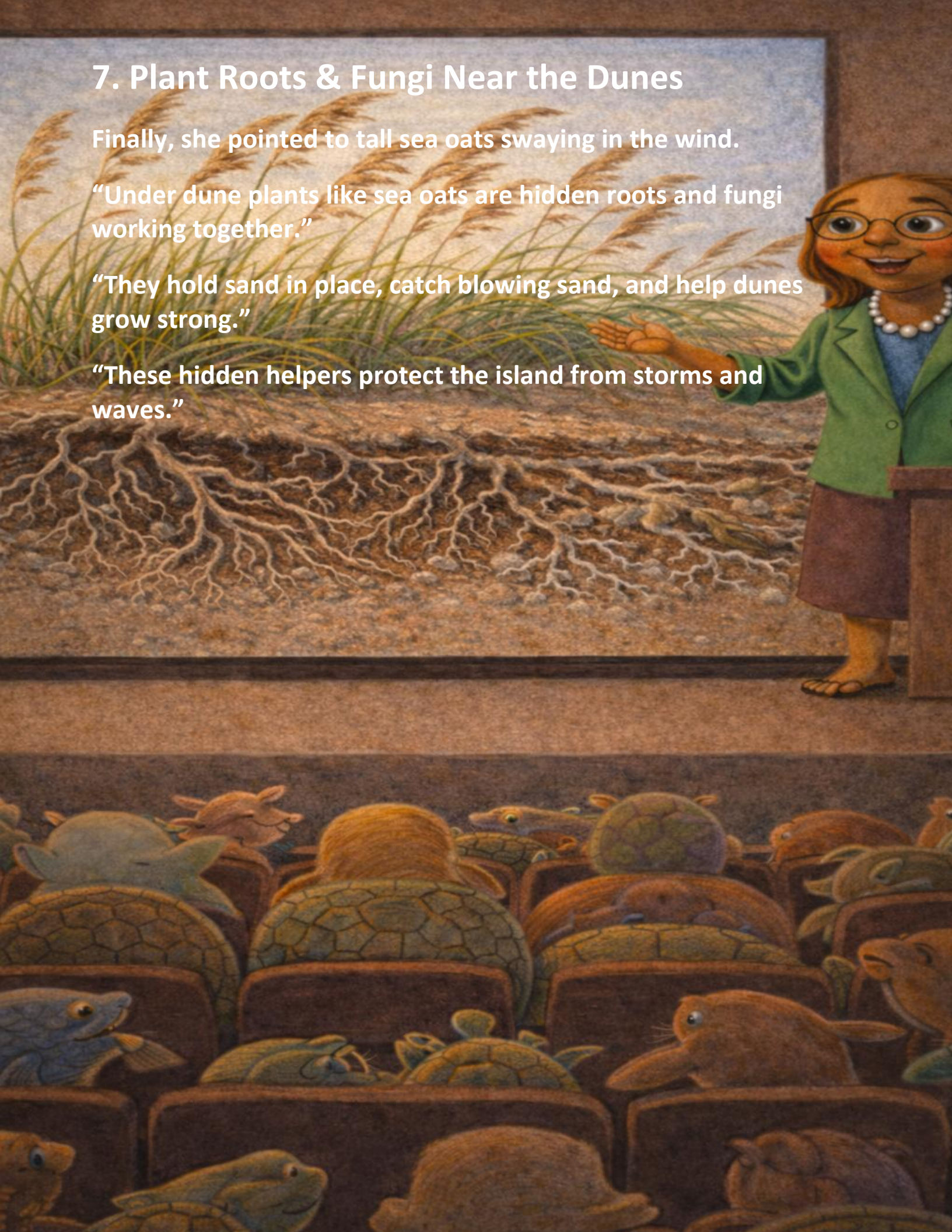
7. Plant Roots & Fungi Near the Dunes

Finally, she pointed to tall sea oats swaying in the wind.

“Under dune plants like sea oats are hidden roots and fungi working together.”

“They hold sand in place, catch blowing sand, and help dunes grow strong.”

“These hidden helpers protect the island from storms and waves.”



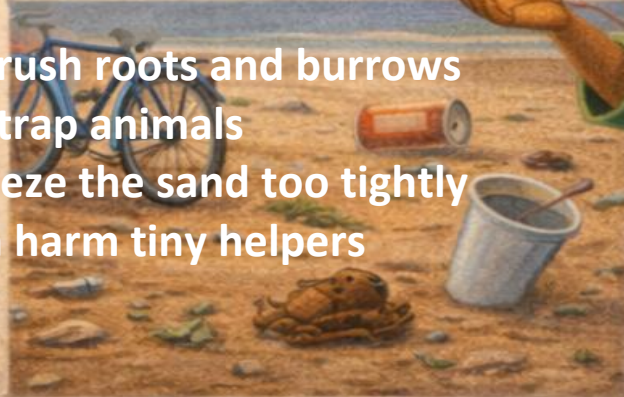
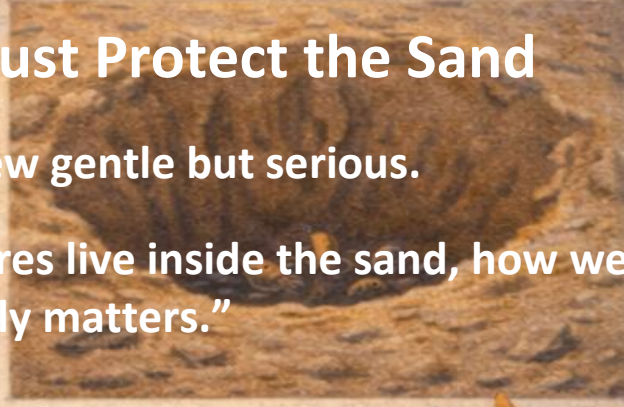
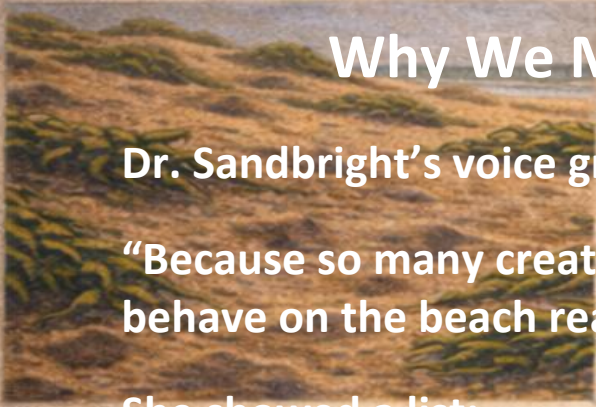
Why We Must Protect the Sand

Dr. Sandbright's voice grew gentle but serious.

"Because so many creatures live inside the sand, how we behave on the beach really matters."

She showed a list:

- Walking on dunes can crush roots and burrows
- Digging deep holes can trap animals
- Cars and bikes can squeeze the sand too tightly
- Trash and dog poop can harm tiny helpers



She smiled again.

“Remember this:
Healthy sand means a healthy beach.

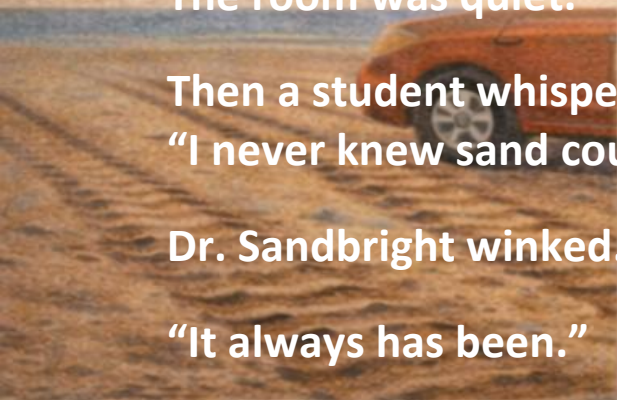
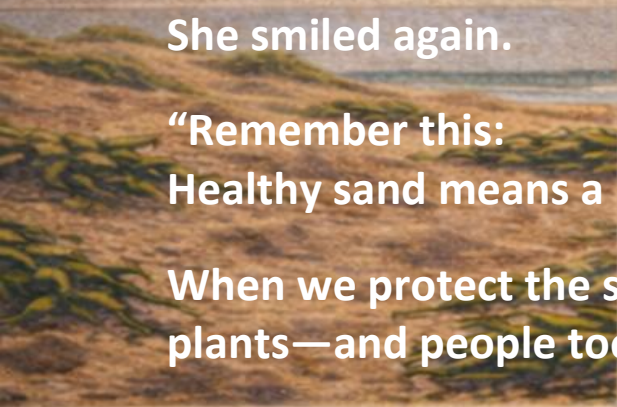
When we protect the sand, we protect crabs, birds, turtles,
plants—and people too.”


The room was quiet.

Then a student whispered,
“I never knew sand could be so busy.”

Dr. Sandbright winked.

“It always has been.”





Did You Know?

Did you know that the sand on the beach is full of life?

Between the tiny grains of sand live microscopic helpers, wiggly worms, clams, crabs, and plant roots—all working together every day. Some clean up leftovers, some help the sand breathe, and others hold the beach in place during storms.

That means when you walk on the beach, you're standing on a busy neighborhood, not just piles of sand!

When we protect the sand—by staying off dunes, filling in holes, and picking up trash—we help keep the beach healthy for animals *and* people.

The beach may look quiet...
but it's always hard at work beneath your toes.

Sea Oats School Science Lesson: The Beach: A Living Ecosystem

follows Sandy, Scoot, and Shellby Dunehopper as they attend a special science lesson at Sea Oats School, where ecologist Dr. Sandbright reveals the hidden world beneath the sand. Through engaging examples, students learn that beaches—especially barrier islands like the Outer Banks—are busy, living ecosystems filled with microscopic helpers, worms, crabs, clams, beach bugs, and plant roots that clean, aerate, and stabilize the sand. The story explains how each organism plays an important role in keeping the beach healthy and protecting it from storms, while also teaching why human actions matter. The lesson concludes with a simple but powerful message: when we protect the sand, we protect wildlife, people, and the future of the beach itself.

About the Publisher

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