

Horseshoe Crab Fun



Goal:

Students will learn about the lifecycles of horseshoe crabs and red knots.

Grade Level: 3-8

Subject Areas:

science, math, English and art

Materials Needed:

- Copies of the "Here Come the Horseshoes!" article
- Postcards from the Shore student page
- Paper and pencils

Time to Complete:

30 minutes to an hour

Activity 1: Postcards from the Shore

Have students read the article "Here Come the Horseshoes!" (below). Both the horseshoe crab and the red knot have interesting life cycles and impressive migrations. Ask students the following questions to get them thinking about the lives of horseshoe crabs and red knots.

- *What do you imagine when you think of a prehistoric creature?*
- *Have you ever seen a horseshoe crab? If so, describe all the details you remember.*
- *When and where do the horseshoe crabs in this story come ashore? Describe the scene.*
- *Why is the name "horseshoe crab" not quite right?*
- *Why are they sometimes called "living fossils"?*
- *How does a horseshoe crab use its tail? Its legs?*
- *How many eggs can a female horseshoe crab lay? Does she lay them all at once?*
- *How long does it take for a baby horseshoe crab to grow up?*
- *Why don't the "extra" crab eggs go to waste?*
- *Why do red knots depend on horseshoe crabs?*
- *Why are the red knots in trouble?*
- *Why does this story focus on the crabs in Delaware Bay instead of one of the other places where they live?*
- *Predict what would happen to red knots if all the horseshoe crabs disappeared. Predict what would happen to horseshoe crabs if red knots became extinct.*
- *What do you think people should do to try to stop the decline of horseshoe crabs and red knots?*

Use the Postcards from the Shore Student Page to have students write a postcard from each of these creatures describing their journeys. Encourage students to imagine the daily life of the animal, its surroundings, its interactions with other animals, and the challenges it faces. Share *Red Knot* by Nancy Carol Willis (see resources below) with students to get them thinking about the stories these animals might tell.

Activity 2: Do the Math

There are some mind-boggling numbers in the story "Here Come the Horseshoes!" from the number of years horseshoe crabs have been on Earth to the number of eggs they lay to the number of

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miles a red knot migrates. Use these numbers to create some math problems for students, such as:

- If there are 10 horseshoe crabs on the beach, how many eyes are there? Legs? (100 of each) If four go back to the sea, how many legs are there now? (60)
- If it takes a female horseshoe crab four nights to lay 80,000 eggs and she lays the same number each night, how many does she lay the first night? (20,000)
- It takes 9 or 10 years for horseshoe crabs to become adults. When are the babies hatched this spring due to come ashore as adults? (2016 or 2017)
- How far is a red knot's yearly round trip journey? (14,000 miles or 22,400 km)

From Ranger Rick Educator's Guide, May 2007.

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Here Come the Horseshoes!

By Kate Hofmann

Every spring, something mysterious happens on the sandy beaches of Delaware Bay. In the dark of night, a throng of prehistoric-looking creatures rides in with the high tide. Thousands come ashore on the ocean waves, their shells clacking together and their spiky tails waving. It looks like a scene from the days before the dinosaurs, and it could be—it's been happening for more than 350 million years. Stop by the beach after the sun comes up, and you just might meet one of these ancient animals face to face. Get ready ...

Horseshoe Who?

The horseshoe crab gets its name from the shape of its shell. The "crab" part of the name doesn't make quite as much sense. Horseshoe crabs are closer cousins to spiders, ticks, and scorpions than to true crabs. But don't worry—they won't bite. (They don't even have teeth.) And that long, spiky tail may look as if it could sting or stab, but it's no threat either.

The tail does have some important jobs, though. In the water, it helps a swimming horseshoe steer. On shore, sometimes a crab is flipped over by the waves. The tail makes a good tool for turning right side up. Even so, sometimes flipping is a struggle. And an upside-down crab can soon be in trouble. If its gills dry out in the sun, it will die. So if you see one that's stranded bottom-side up, help it out: Just flip it!

Ten Legs and Ten Eyes

Under a horseshoe's bowl-shaped shell are ten spidery legs. As the crab walks along the ocean bottom, it digs up its favorite foods: worms and clams. But how does it eat with no teeth? With help from its spiny legs! As the legs move food toward the crab's mouth, spines break it down into bite-sized bits.

A horseshoe crab also has ten eyes. Eight are simple ones that sense just light and dark. The two large eyes on its shell see more, and they see nearly as well in the dark as in daylight. What might the crab want to spot with those eyes? A mate, of course!

Crab Tide

In Delaware Bay, horseshoes come out of the sea to

mate on nights in May or June. The time is right when the tide is highest, around the full or new moon. Like armored tanks, the crabs advance onto the beach. As females lay their eggs, the tag-along males fertilize the eggs with sperm. Over four or five nights, each female lays 80,000 eggs or more!

When their work is done, the crabs return to the sea. As they go, they leave looping trails like signatures in the sand. "We were here!" they say.

Egg Extravaganza

The crabs also leave behind billions of eggs. More horseshoe crabs come ashore on the beaches of Delaware Bay than anywhere else in the world. As some crabs leave, more arrive. That means eggs in the earlier nests are often dug up as later crabs make their nests. These eggs dry out and won't hatch. The extra eggs don't go to waste, though—not at all! They become part of an enormous egg feast. You see, horseshoe crabs aren't the only ones traveling to these beaches. At the same time, huge flocks of hungry birds are making a great journey of their own.

An Eggs-cellent Feast

Red knots are robin-sized birds on a mission. Every year, they migrate from the tip of South America to the Arctic—an amazing journey of more than 7,000 miles (11,200 km)! The birds land only a few times to rest and refuel. Delaware Bay is their most important stop.

The knots (and many other shorebirds) arrive just as the crabs lay their eggs. Huge flocks get busy feasting. Red knots need to double their weight in just two weeks, and that means every bird must eat thousands of eggs each day. (That sounds like bad news for the crabs, but don't worry. These eggs are the extra ones that wouldn't hatch anyway.)

Birds in Trouble

There is bad news, though. For some reason, lots fewer crabs are coming ashore. Maybe it's because people are catching too many crabs. Maybe it's pollution in the bay or seawalls blocking the beaches where crabs nest.

Whatever the cause, there aren't as many extra eggs for the hungry birds. That's a big problem for the red knots.

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Without an egg feast, knots don't have enough energy to get to the Arctic and lay their own eggs. The number of knots is dropping fast. Scientists say they could be extinct in just five years unless something is done.

Many people are trying to help. Several states have passed laws to stop people from catching crabs for the next year or two. Scientists are busy trying to

learn more about the crabs and the knots—and to discover why they're disappearing.

Meanwhile, we're all hoping that horseshoe crabs—and the birds that depend on them—will be around for millions more years to come!

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Postcards from the Shore Student Page

Horseshoe crabs and red knots both take a trip to Delaware Bay each year. What do you think they might want to say when they arrive? Use your ideas to fill in the postcards below—one from a horseshoe crab and one from a red knot.

