

LESSON 4

Sandy Beach

Grades 4 – 7

Objectives

- To identify animals that live on a sandy beach.
- To identify challenges to living on a sandy beach.
- To name some adaptations animals need to live on a sandy beach.

Materials

Book: *Once Upon a Seashore* by Gloria Snively.

Video: *The Biology of Seashores* by Biomedica Associates Video (www.ebiomedica.com).

Video: *The Biology of Echinoderms* by Biomedica Associates Video.

Moon snail shell and operculum, razor clam shells, crab moults, sand dollars.

Photos or drawings of sandpiper, razor clam, sand sole, sand dollar, moon snail, sand worm, beach hopper (can use *Ocean Animal Clue Cards* from *Once Upon a Seashore* by Gloria Snively).

Concepts

- Sandy beaches are in a constant state of change and motion.
- Animals must protect themselves from shifting, abrasive sand.
- An adaptation is how an organism is specifically equipped to survive in its habitat.

Activities

1. Introduction to sandy beaches

Watch the *Sandy Beaches* and the *Meiofauna* portions of the video *The Biology of Seashores*.

Watch the *Sand dollar* portion of the video *The Biology of Echinoderms*.

Discuss what the students have seen:

- On sandy beaches, most creatures live under the surface of the sand (mostly clams and worms).
- Many kinds of creatures cannot survive on sandy beaches without anything stable to attach to.
- Many animals living on sandy beaches must burrow under the sand or move with the tides. Burrowing animals are safe from wave action and drying out, but have lots of predators. For example, the moon snail is a predatory burrower! When the tide is out gulls and sandpipers are also predators.
- When the tide is in, the sandy beach is a hunting ground for flatfish. They come from deeper water and gobble up clams and crabs. Carnivorous worms eat any animal they can find dead or alive!

Ask students if they have ever been to North Beach or Gray Bay. Ask them to describe what North Beach or Gray Bay is like. Do they see a lot of intertidal animals and seaweed there? Why not?

A: No, because most of the intertidal animals live under the sand and seaweed does not have a stable place to anchor.

What kind of animals have they seen there?

A: Birds, crabs, cockles, etc.

2. Inhabitants of sandy beaches

Show students pictures of sandy beach animals such as moon snail, Dungeness crabs, razor clams, etc.

What do you notice about the creatures you see? What are adaptations?

A: Adaptation is how an animal is especially equipped to survive in its habitat.

What adaptations do sandy beach creatures have?

A: They may have a hard shell like the moon snail, razor clam and sand dollar. They may have tough skin like the sand worm.

Could barnacles live on a sandy beach?

A: No, because there are no rocks for them to attach to.

Could seaweed grow on a sandy beach?

A: No, because there are no rocks for the holdfast to attach to either.

What makes it difficult to live on a sandy beach?

A: Shifting, abrasive sand, no hard places to attach, wind, rain/snow, crushing surf, sun.

3. Who am I?

Ask students to guess which animal is speaking. Tell them not to guess until they have heard the whole description.

Moon Snail Monologue (if snails could talk)

You've heard of the expression "Putting your foot in your mouth," haven't you? Well, it's not like I do it on purpose but I'm a gastropod which means stomach foot. My stomach is on my foot. And I'm not just a pretty shell - I'm a great hunter. Clams can move and hide but I can find them under the sand. That sand, by the way, is like sandpaper so I have a fold in my foot to protect my eyes.

When I find a clam I use acid from the tip of my tongue to soften the shell and then with the teeth on my tongue I drill right in for din (dinner). I use my foot to help hold my dinner.

So if you want to be like me, wear a hood, dig under some sand, hold your dinner with your foot and add teeth to your tongue.

Who am I?

I can fit into my shell and close it up tight. The operculum is the little door that closes if I, the moon snail, want to close up completely.

4. Adaptations to a Surf-swept Sandy Beach

From page 174 of *Once Upon a Seashore* by Gloria Snively.

List the following animals and adaptations on the board. Students will match the adaptations to the animals. Set up *Ocean Animal Clue Cards* or pictures with information on them so that students can check their answers.

Animals

Sandpiper
Razor Clam
Sand Sole
Sand Dollar
Moon Snail
Sand Worm

Adaptations

Moves swiftly
Camouflaged
Thick hard shell
Streamlined shape
Swims beyond the surf
Tough skin
Burrows
Flat shape
Muscular foot
Long legs

Answers:

Sandpiper – moves swiftly, long legs

Razor Clam – burrows, streamlined shape, muscular foot

Sand Sole – camouflaged, swims beyond the surf, flat shape

Sand Dollar – flat shape, streamlined, lives beyond the surf

Moon Snail – burrows, thick hard shell, muscular foot

Sand Worm – tough skin, burrows

Go over the answers with students and discuss the adaptations these sandy beach dwelling animals have and why. Talk about where on the beach they live. Do they live at the tide line? Beyond the surf?



5. Create a sandy beach habitat

Ask students to draw a sandy beach or find a picture of a sandy beach that includes a surf line and dunes.

Refer students to pictures of sandy beach animals on page 177 of *Once Upon a Seashore* by Gloria Snively. Review where different animals live on the beach.

Ask students to draw animals on the appropriate spot on their beach drawing or picture. For example, beach hoppers are at the surf line, while sand soles are in the subtidal (beyond the surf).

6. Rocky shore versus sandy beach

Compare the rocky shore to the sandy beach habitat.

Are there more or less species of animals that live on a sandy beach rather than on a rocky shore?

A: There are less numbers of species on sandy beaches because there is less variety of habitats (fewer kinds of homes).

Where can animals live on a rocky shore?

A: They can live on the rock, under the rock, on the side of the rock or in crevices or between rocks.

How are rocky shore and sandy beach animals adapted differently to their habitats?

A. Rocky shore creatures usually attach to rock while sandy beach creatures usually have to move with the tides or live under the sand.

Conclusion

- Review sandy beach animals and their adaptations.
- Show all the sandy beach drawings and talk about them.

Extension

Draw a “Wanted Dead or Alive” poster. Pretend you are an intertidal predator (for example, a moon snail or sunflower star). Draw pictures and list the prey animals that you are looking for. See if others can guess who you are.