

LESSON 1

Structure and Behaviour of Marine Animals

Grades 4 – 7

Objectives

- To address learning outcome from Science IRP: *Relate structure and behaviour of local organisms to their survival.*
- To identify how intertidal animals protect themselves.

Materials

Video: *Biology of the Seashore: Biomedica Associates* (www.ebiomedica.com).

Book: *Once Upon a Seashore* by Gloria Snively, Kingfisher Press, 2001.

Station 1: moon snail shell and operculum, whelk shell, turban snail shell, snail cards from *Ocean Animal Clue cards* (with *Once Upon a Seashore* by Gloria Snively).

Station 2: Three containers: (1) Filled with marbles or small balls and a plastic animal of similar colour and shape, (2) Filled with the same shaped objects eg. plastic crabs or spiders, many of one colour and one that is a contrasting colour, and (3) Filled with objects that are the same colour but a different shape eg. orange plastic crabs or spiders and an orange ball, photo of a well-camouflaged intertidal creature eg. tidepool sculpin or sole, model of a blenny (gunnel).

Station 3: close up drawing of a sea urchin that shows spines and pedicellaria, photo of a scallop using jet propulsion to escape from a predator.

Station 4: picture of a sculpin, description of a sculpin, picture of a crab, drawing of a crab, drawing of a sea star with a leg that has been regenerated.

Concepts

- Animals in the intertidal zone have different ways to protect themselves and

may have more than one way to protect themselves.

- Intertidal animals protect themselves from their environment, such as wave action and drying out, as well as from predators.
- Animals that cannot move are more limited in ways to protect themselves than animals that can move.

Activities

1. How does the structure and behaviour of animals help them survive? Ask students to think of examples of animals they have seen on the beach and in tide pools.

What do they protect themselves from?

A: wave action, predators, drying out

How do they protect themselves?

A: shells, can move fast, suction to rocks, hide under rocks, etc.

2. Discuss examples of survival behaviour (from *Beside the Sea* by K. Francis and G.S. Jamieson, Fisheries and Oceans Canada):

1. retreat (into shells to protect soft parts) – barnacle, snail
2. detect and flee – scallop, cockle, abalone
3. camouflage – sculpin, sand star
4. maintain body armour – hermit crab
5. seek shelter – blenny, shore crab

Would these protection devices work every time? Why not?

A: Some predators can overcome them i.e. gulls break clams by dropping them, a blenny may not swim to shelter in time.

3. Stuck in one place versus moving around.

Would an animal be safer if it could move than if it couldn't move?

A: Yes because it has more options for survival. It is more limited if it must stay in one place.

Think about the animals that cannot move (mussels, barnacles) and compare them to animals that can move (crabs, sculpins).

Show a video clip of an abalone and scallop escaping predators from the video *Biology of the Seashore*, Biomedica Inc.

4. Discuss regeneration with students. Ask students if they have ever seen sea stars with a ray that is smaller than the rest, or crabs with one claw smaller than the other.

How is it helpful to be able to regenerate a limb or claw like a sea star or crab can?

Discuss how sea cucumbers can protect themselves. If a predator attacks them, they spew out some of their internal organs and grow new ones.

Activity Stations

Set up 4 stations around the classroom. Students will split into 4 groups, rotating to each station, and answer questions on their worksheets.

Station 1

Students examine a moon snail shell and operculum, whelk shell and snail cards.

1. How does a snail protect itself from predators?
A. By withdrawing into its' shell.
2. Does a snail's house have a door? What is the door called?
A. Yes. It is called an operculum. It seals the shell up so the snail is protected from predators and from losing moisture.
3. Draw a human's house and a snail's house.

Station 2

Students examine 3 containers: One filled with marbles and a plastic crab or spider that is a similar colour and shape. The second filled with mostly orange plastic spiders or crabs and one black spider or crab. The third is full of orange spiders or crabs with an orange pumpkin. Students can see that both colour and shape helps animals to camouflage with their background habitats.

1. Look in the 3 containers. Which animal is camouflaged the best?
A. The best camouflaged animal is the one that

is a similar shape and colour as its background.

2. Look at the photo. What animal is using camouflage?

A. The tidepool sculpin or sole.

3. Draw a background so that the blenny is camouflaged. *Students should draw a speckled background so that the blenny will be well camouflaged.*

Station 3

Students look at a (1) close up drawing of a sea urchin that shows spines and pedicellaria and (2) a photo of a scallop using jet propulsion to escape from a predator.

1. What 2 parts of its body can a sea urchin use to protect itself?
A. spines and pedicellaria
2. How does a scallop protect itself from predators?
A. It uses jet propulsion to escape. It opens and closes its shell to cause the propulsion.

Station 4

Students look at a picture of a sculpin and then read the description of a sculpin (from Gloria Snively's book *Once Upon a Seashore*, page 48.) Then they look at a picture of a crab and a drawing or photo of a crab and sea star with a claw or leg that has been regenerated.

1. Name at least 4 ways a sculpin can protect itself.
A. camouflage, tough skin, big teeth, move quickly.
2. How does a crab protect itself?
A. By using its claws to fend off predators, or by hiding under rocks or in the sand.
3. What happens if a sea star or crab loses one of its legs?
A. They can regenerate a new leg.

Conclusion

Go over the answers to the questions from each station. Review how animals protect themselves through adaptations and behaviours.