

Life Cycles of the Saltmarsh

Students will build life cycles of plants and animals of the saltmarsh.

Objectives

- Students will be able to describe a life cycle.
- Students will be able to identify the saltmarsh as a unique habitat for plants and animals.
- Students will be able to classify animals as reptiles, birds, fish or invertebrates.
- Students will be able to build a life cycle of *Sporobolus* and an animal in the saltmarsh.



Island Magazine

South Carolina Science Standards

2.S.1A.1, 2.L.5A.2, 2.L.5A.3, 2.L.5B.2
4.L.5A.1, 4.L.5A.2, 4.L.5A.3

Materials in Bin

- Copy of 'Life Cycles of the Saltmarsh' activity
- Aquarium map (Saltmarsh starred)
- Large magnetic white board (for teacher) – won't fit in bin
- Pictures of a saltmarsh at high tide and low tide
- *Sporobolus* and periwinkle snail life cycle bags (teacher bags)
- 4 small magnetic white boards (for students)
- Oyster life cycle bag*
- Red drum life cycle bag*
- Diamondback terrapin life cycle bag*
- White ibis life cycle bag*
- Life cycle answers (for teacher only)
- "A Day in the Salt Marsh" by Kevin Kurtz

* The life cycle bags will have each stage of the plant/animal's life cycle and arrows (all magnetic).

Background

The saltmarsh is one of the most productive ecosystems on earth. It covers 400,000 acres of South Carolina and can be found bordering estuaries and rivers or behind barrier islands. It has many functions including acting as protection from the ocean to the land, a nursery for many animals of the ocean, a filter between land and sea and a habitat for a variety of animals and plants. Because of the constant changing tides, the diversity of life is great in the salt marsh. What thrives at high tide (oysters, fish, crabs) can be very different than what thrives at low tide (birds, periwinkles snails).

Sporobolus (*Sporobolus alterniflorus*) is the new name for *Spartina* grass (*Spartina alterniflora*), also known as marsh grass or smooth cordgrass. This name change happened in 2018. *Sporobolus* is very abundant in the saltmarsh. This plant can live in saltwater by excreting salt and also deal with the harsh changing tides. The life cycle of *Sporobolus* begins with a seed in the fall. The seed sprouts within the mud and becomes a seedling in the spring. The seedling grows into a plant that will make tiny white flowers in the fall to produce seeds.

Life Cycles of the Saltmarsh

Periwinkle snails (*Littorina littorea*) are small gastropod mollusks that can live their entire adult life on one blade of Sporobolus grass. This invertebrate begins life as an egg (females release eggs into water in early spring). The egg will hatch into a larva that will settle on the bottom of the marsh in late spring. It will continue to grow where it finds a blade of grass to live on. It becomes an adult when at about 18 month (10 mm).

Oysters (*Crassostrea virginica*) are bivalve mollusks that once settled in an oyster bank, don't move. This invertebrate begins life as an egg (females release eggs into water to be fertilized). The fertilized egg will hatch into a larva and for about 2 weeks it will float around in the water. After 2 weeks, it settles on a hard surface and is called spat (young oyster). It will continue to grow and become an adult after 1-3 years.

A red drum (*Sciaenops ocellatus*) is a fish that spends its young life in the salt marsh and adult life in the ocean. Females will release eggs into the ocean near shore in early fall. The eggs hatch after about 24 hours and become larval fish. The tides bring the larvae into the saltmarsh where they grow and mature. Over time they become small juvenile fish and then adult fish after about 4 years.

A diamondback terrapin (*Malaclemys terrapin*) is a reptile and the only turtle that spends its entire life in a saltmarsh. Females lay 10-15 small leathery eggs by digging a hole in the mud/sand above the high tide water in the marsh. The eggs incubate in the mud for about 2-2.5 months and then hatch. The hatchlings are only about 1.5 inches and after they grow, become juveniles. At about 3 for males and 7 for females, they become adults.

A white ibis (*Eudocimus albus*) is a wading bird with white feathers and a long orange curved beak. The female will lay 1-5 eggs in a nest in a tree near the marsh. The eggs hatch after about 3 weeks and the babies are called chicks. After about 6 weeks, the hatchlings become fledglings (can leave the nest and fly). At age 2 they are adults and can breed.

Procedures

Pick up exhibit activity bin and white board from Information Desk. Go out in the Saltmarsh exhibit on 2nd floor.

- 1) Review the following with your students.
 - a. We are in a saltmarsh habitat. Look around you and notice the plants and animals. This is a unique habitat. Does anyone know why?
 - b. Because it is a habitat where fresh water comes down from a river and salt water comes up from the ocean to mix. This water is called brackish water.
 - c. The plants and animals must be able to handle living in this brackish water as well as handle the changing tides. Do you guys know the difference between high tide and low tide? Have you ever been to the beach and seen high tide and low tide?
 - d. High tide is when the ocean water comes up higher on the land and low tide is when the ocean water does not come up high on land. In Charleston we see 2 high tides and 2 low tides every day.
 - e. Sporobolus is a very special plant that loves to live in brackish water. Most plants can't survive in salty water. There are also many animals that love to live in the saltmarsh habitat such as periwinkle snails, oysters, diamondback terrapins, red drum fish and white ibis birds.

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- 2) Let students know that they are going to discover more about the saltmarsh by building life cycles. Review what a life cycle is with the group. It is a way of looking at the life of an organism from egg/seed to adult.
- 3) Demonstrate how to do the activity by building the Sporobolus and periwinkle snail life cycles on the large board. Be sure to cover some basic terms.
 - a. Seeds
 - b. Seedling (young plant)
 - c. Egg
 - d. Larva (plural larvae)
 - e. Juvenile (young animal)
 - f. Adult (has reach maturity – can have babies)
 - g. Hatchling (young animal that has just come out of an egg)
 - h. Fledgling (young bird that has just learned to fly)
- 4) Now, split the group into pairs. You have enough materials to have 4 groups. If you don't need that many groups, leave extra life cycle bag/s in the bin.
- 5) Hand out the life cycle bags to the pairs, showing them what animal they will be working with. Ask each group what kind of animal they have (Is it a reptile, bird, fish, amphibian, mammal or invertebrate?).
- 6) Have them locate their animal in the exhibit.
- 7) Give groups about 5 minutes to build their animal's life cycle using the materials in the bag.
- 8) Come back together as a group and have each pair show the group their animal's life cycle.
- 9) When done, place all life cycle materials back in their correct bag and place everything in the bin.
- 10) If time allows, read "A Day in the Salt Marsh" by Kevin Kurtz
- 11) Take activity bin and board back to the Information Desk when done.

"A Day in the Salt Marsh" by Kevin Kurtz can be purchased from the local publisher, Arbordale Publishing in Mt. Pleasant, SC or online.