

Turtle Hurdles Lesson Plan

Activity: Turtle Hurdles

Adapted From: Project Wild Aquatic

Grade Level: 6-12

Time Required: one 90 minute block or two 45 minute class periods

Objectives:

- (1) Students will describe the life cycle of sea turtles.
- (2) Students will identify specific mortality factors that drove the Kemp's Ridley to near extinction.
- (3) Students will make inferences about the effects of limiting factors on sea turtle populations
- (4) Students will make recommendations to minimize the factors that might lead to the extinction of sea turtles.

Key Terms:

life cycle, endangered species, prey, predator, limiting factors

Method:

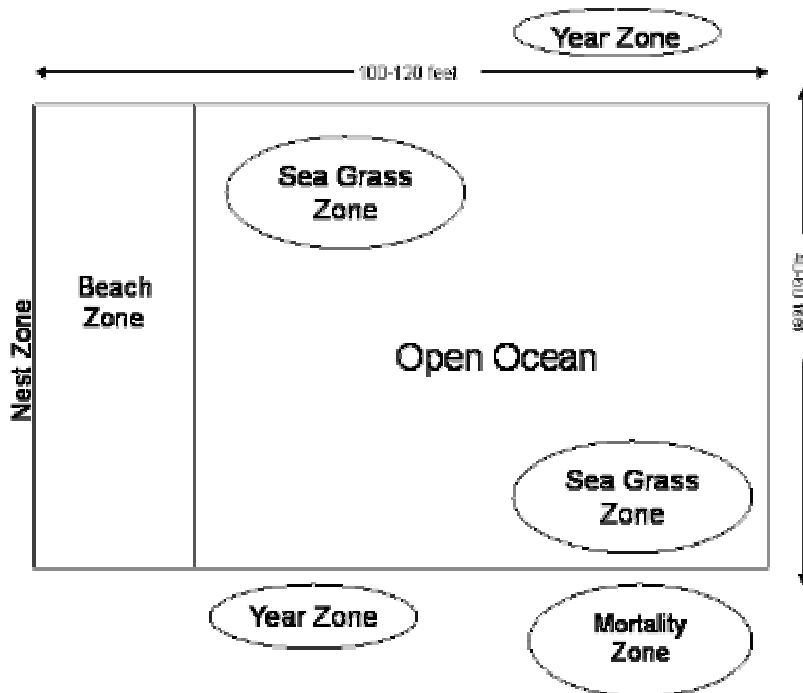
Students become sea turtles and limiting factors in a highly active simulation game.

Materials:

40 to 60 feet of rope or string, two jump ropes or hula hoops, one paper or plastic bag per student, identity cards for each predator or limiting factor (can be drawn by students), wooden clothes pins, poker chips, dried beans.

Procedure:

1. Give each student and copy of Turtle Hurdles Reading Activity. Students will read the passage in small groups for every paragraph the group must write a question, comment, or connection in their turtle journal. They should also begin to compile a list of things that are likely to have contributed the near extinction of the Kemp's Ridley sea turtle. Upon completion of the activity, allow groups to volunteer to share their responses.
2. Optional – Show the YouTube video clip of the Sea Turtle nesting approximately 3 minutes in duration.
3. Set up the activity area as shown below. Give each student a paper or plastic bag.



Areas defined:

nest zone – the place where the eggs are laid and hatch (This is the zone to which the surviving turtles will return in 10 years. It is where the baby turtles will hatch and begin their journey to the sea.)

beach zone – the zone the hatchlings must cross to get to their sea. (It is the place of high predation and other limiting factors).

sea zone – the area where the turtles must mature for a period of ten years before returning to the nest.

year zones – the two zones that the turtles must visit to acquire the year cards necessary to mature to 10 years of age. (One poker chip is awarded for each one-way trip to between the zones, the turtles are vulnerable to predators and other limiting factors. Turtles are safe from other limiting factors when they are inside either year zone).

sea grass zones – places where the turtles are safe until they reach 4 years of age (At that age they are too big to hide from predators).

4. Divide the class into 2 groups

Group 1 – Turtles

Each student counts out 50 beans to place in his or her bag. Beans represent turtles. Each bag of beans represents the turtles that hatch from a single nest.

Group 2 – Limiting Factors

Divide this group into two smaller groups, on-land and in-sea.

On-land: Predators (e.g. – raccoons, dogs, ghost crabs, foxes, and gulls) and limiting factors from human activities (e.g. dune buggies, human egg collectors, shoreline development).

In-sea: Predators (e.g. sharks, killer whales) and limiting factors from human activities (e.g. entanglement in fishing gear, eating plastic litter, illegal killings by humans)

Give each student a sign that indicates what kind of limiting factor each one represents. Attach those identity signs to students clothing with clothes pins.

5. Walk the class through the activity and explain these rules:
 - a. Turtles must hatch, cross the beach, and spend 10 years in the open ocean. The turtles running between the year zones simulate the time in the ocean. They pick up one poker chip at a year zone and then run to another year zone to pick up a poker chip. Each chip represents 2 years of successful ocean survival. After collecting 5 poker chips, turtles return to the nesting area to reproduce.
 - b. Turtles try to avoid limiting factors and predators. If tagged by a limiting factor a turtle stops, counts out 10 beans, and places those 10 beans in the limiting factors bag.
 - c. The ocean's sea grass areas are turtle safety zones where limiting factors cannot tag them. The teacher may set a time limit for how long a turtle may rest in the sea grass zone. **OPTIONAL:** The teacher may eliminate the safety zones after the turtles have been in the ocean for a while. This simulates the turtles growing too big to hide in the sea grass.
 - d. Limiting factors must obey the following rules:
 - i. They cannot tag the same turtle twice in a row.
 - ii. They cannot tag turtles that are counting out beans to another limiting factor.
 - iii. They must stay at least four steps away from any turtle that is transferring beans to another limiting factor.
 - e. Any turtle that loses all 50 beans is dead. It must go to the beach and become a condominium. If the condominiums (standing side by side) eventually block the access to the nesting beach, the remaining turtles die without reproducing and starting the next cycle.
 - f. The activity ends when all the turtles are either dead or have returned to the nest area.
6. Review the rules two times to make sure the students understand their roles and the procedures. Students then become endangered sea turtles or limiting factors and conduct the activity.
7. After completing the activity, encourage the students to discuss the results. It is likely that some students will be disturbed by the high mortality rate of the turtles and will benefit from the realization that there are groups actively trying to diminish human contributions to such high mortality. However, it is also important to emphasize that natural limiting factors are built into the scheme of things. If all sea turtle eggs survived, there might well be an overabundance of these creatures. Many animals produce

- more young than will survive, serving as food for other species as a part of nature's dynamic balance. Ask the students to briefly describe the life cycle of sea turtles.
8. Repeat the activity but change the ratio of predators and hazards to turtles (1/3 predators or hazards to 2/3 turtles). As a class describe and discuss the differences.
 9. Repeat the activity and remove all human factors. As a class discuss the differences.
 10. Summarize the importance of the high numbers of turtles that result from reproduction. Ask students to respond to the following questions in their turtle journal
 - a. Describe and illustrate the major stages of sea turtles' life cycles, beginning with the egg.
 - b. Identify and discuss at least 4 limiting factors that prevent sea turtles from reaching the adult breeding stage.
 - c. What specific recommendations would you suggest to increase the successful reproduction and survival of sea turtles?
 - d. Write a law that would help protect sea turtles. What would the law include? Who would enforce it?