

## Sea Turtles – An Issue Investigation

### Summary:

Students work in groups to learn more about the sea turtles of Puerto Rico. They will also play an active game in which they are hatchlings and need to overcome obstacles in order to survive. Finally, the students will participate in an issue investigation that will require them to take an assigned role and present a persuasive argument that will “Save the Turtles”.

### Background Information:

The Virgin Islands and Puerto Rico have provided critical nesting, foraging, and developmental habitat for the leatherback, hawksbill, and green sea turtles for many, many years. The leatherback requires open sand beaches with no near shore reefs for nesting. The green and hawksbill turtles nest in vegetated dunes, low scrub and beach forested areas which are often fringed by shoreline reefs. Juvenile sea turtles live in coral reef and seagrass habitats and remain there until they reach sexual maturity. Adult female leatherback turtles primarily live in open seas, but migrate to the tropics every 2 to 3 years to nest.

Historically, sea turtle fishing existed for subsistence only. Leatherback turtles were slaughtered on the nesting beaches for their oil, and their eggs were harvested for food. Green turtles, while foraging in the Virgin Islands in their juvenile years, were fished for food and export to Europe. In the 1920’s, the hawksbill turtles were fished to support the tortoiseshell industry (made into curios and jewelry). So many were harvested that it was common to see the dead carcasses on the beach, and the populations declined rapidly. In the 1950’s coastal development boomed and eliminated many of the sea turtle nesting sites, especially around St. Thomas. Subsistence hunting continued, and to meet the demands of a growing human population, sea turtles were imported from other islands because the juvenile populations had declined so much.

In 1972 the Virgin Islands finally made a law to make it illegal to harvest sea turtles on their nesting beaches and allowed harvest in the water only between October and April. In 1973 leatherback and hawksbill turtles were

**Grade Level:** 5<sup>th</sup> grade

**Goal:** To create an appreciation and attitude of caring for the conservation of sea turtles coupled with an understanding of conflicting human interests and needs.

**Key Concepts:** When an environment changes, some plants and animals move, adapt, or die.

**Objectives:** Upon completion of this lesson, students will:

- 1) Identify the difficult choices to be made between earning a living and protecting the environment.
- 2) Demonstrate the ability to write and present persuasive arguments.
- 3) Identify sustainable ways to earn a living while protecting the environment.

**Teaching Location:**  
Indoors and outdoors

**Lesson Time:**  
Five to six sessions

**Subject Areas for Infusion:**  
science, social studies, math

**Standards**  
Environmental Education  
D.8.1

Science  
B.8.1  
A.8.3

Social Studies  
A.8.8  
A.8.11  
D.8.11

Math  
A.4.5

protected under the U.S. Endangered Species Act; in 1978 the green turtle was listed as a threatened species. Currently populations seem to be stable, but there are no significant signs of recovery despite more than a decade of protection.

The greatest threats to the sea turtles today are coastal and upland development, introduction of domestic and non-indigenous animals, boating (commercial and recreational), incidental take in fisheries, illegal harvest of adults and eggs, ingestion of and entanglement in marine debris, inadequate local protection and enforcement of laws, and insufficient regional cooperation for turtle protection. Although efforts are being made to protect the sea turtles and their nesting sites in the U.S. Virgin Islands and Puerto Rico, regulations in the adjacent British Virgin Islands aren't as strict or heavily enforced. Public education programs have become the most effective weapon against the continued killing of sea turtles.

**Vocabulary**

**endangered species:** A species threatened with extinction.

**threatened species:** A species that may be abundant in some area but threatened by man or the environment.

**subsistence:** a means of support or livelihood, especially bare means.

**nonindigenous animals:** a species that does not occur naturally in an area or habitat.

[http://www.oneocean.org/ambassadors/track\\_a\\_turtle/biology/index.html](http://www.oneocean.org/ambassadors/track_a_turtle/biology/index.html) - One Ocean Organization-Turtle Biology Information

<http://biology.usgs.gov/s+t/SNT/noframe/cr136.htm>  
- "Sea Turtles of the Virgin Islands and Puerto Rico"- US Geological Survey

**Materials:**

- Access to Internet and LCD projector for classroom
- Copies of information on sea turtles from Internet or other sources
- Poster paper, rulers, scissors.
- Copy of "Turtle Hurdles" (see specific supply list for this activity)
- Teacher-modeled copy science notebook entry for "Turtle Hurdles" activity
- Copy of "Saving the Turtles – Tortuguero"
- Copy of "Roles" handout
- Map showing U.S. Virgin Islands and British Virgin Islands

**Set-Up:**

- 1) Print out copies of information on leatherback, green and hawksbill turtles from these Internet sites or any other source that would have information for students to read about the different species of sea turtles at their level.

US Fish and Wildlife Service Information:

<http://southeast.fws.gov/vbpdfs/species/reptiles/hstu.pdf> - hawksbill turtle

<http://southeast.fws.gov/vbpdfs/species/reptiles/lstu.pdf> - leatherback turtle

<http://www.cccturtle.org/green.htm> - green turtle (with links to others)

- 2) Arrange a time and place to do the “Turtle Hurdles” activity outdoors.
- 3) Photocopies for each student – “Saving the Turtles – Tortuguero” and “Roles” handout.

**Procedure:****Introduction (Day 1)**

1. Visit the Internet site that tells about Julian Garcia Marinez, “Footprints in the Sand” grassroots organization and their efforts to monitor sea turtle nesting sites on Vieques.  
<http://southeast.fws.gov/vieques/vieques-Achive-Acompl.pdf>

**Activity 1 – Meet My Turtle (Day 1)**

1. Break class into three groups. Each group will be responsible for reading the background information about the leatherback, green and hawksbill turtles found in Puerto Rico. Have students create life-size paper models of the various species, both as hatchlings and adults.
2. Place one person from each of the turtle groups to form a new three-person group. Students share what they read about their species with the others. (Jigsaw the information)
3. Ticket-out-the-Door – Have students independently list reasons why the turtles are listed as endangered or threatened species. (Save these responses for later)

**Activity 2 – “Turtle Hurdles” (Day 2 - outdoors)**

1. Follow the procedure for “Turtle Hurdles” on pp. 153-157 in Project Wild Aquatic. Model a science notebook entry for keeping track of the results of the birth and death rates. (See example of science notebook entry attached)
2. After playing a couple of rounds, have students analyze the data collected. Do they notice any patterns?
3. As a class, return indoors and write the conclusion for the entry.

**Activity 3 – “Saving the Turtles” – (Day 3 - 5)**

1. Share with the class the students' Ticket-out-the-Door from Day 1. Are there any other potential issues to be added to the list that were discovered during the previous day's "Turtle Hurdles" activity?
2. Read aloud the "Saving the Turtles – Tortuguero" and identify potential issues to be considered when debating the conflict between preservation of the turtles and human needs to earn a living.
3. Read the seven roles. Put students in groups of three or four and assign each group one of the seven roles. In their roles, students should create a new plan for the "Saving the Turtles" situation. Each group will write a persuasive position plan, having at least three arguments to support their points of view.
4. Each group orally presents its persuasive arguments and its proposed course of action. Students should take notes during the arguments.

### **Conclusion (Day 6)**

1. As a class, find a way to save the turtles that also considers the desires and needs of people. (Ultimately, needs must take precedence over desires.)
2. Discuss the difference between the class' final action plan and what Julian has been doing with his students in Vieques.

### **Assessment**

Students should identify at least four conflicts between earning a living and conserving the environment.

### **Adaptations:**

**Students with special needs** – Allow students to watch a video on sea turtles instead of reading the material to gain background information.

**Younger students** – Skip Activity #1 and do Activity #2 first. Choose only one or two of the roles to do as a model of a persuasive argument as a class for Activity #3.

### **References:**

"Saving the Turtles – Tortuguero", Boots, Bananas, and Biodiversity, Center for Latin American, The University of Wisconsin – Milwaukee, 1996.

"Turtle Hurdles", Project Wild Aquatic, Western Regional Environmental Education Council, 1987, pp. 153-157.

"Sea Turtles: Rare and Remarkable Reptiles", Windows on the Wild – Oceans of Life, World Wildlife Fund, 2003. p. 315.

US Fish and Wildlife Service Information:

<http://southeast.fws.gov/vbpdfs/species/reptiles/hstu.pdf> - hawksbill turtle

<http://southeast.fws.gov/vbpdfs/species/reptiles/lstu.pdf> - leatherback turtle

<http://www.ccurtle.org/green.htm> - green turtle (with links to others)

**Lesson Title:** Turtle Hurdles

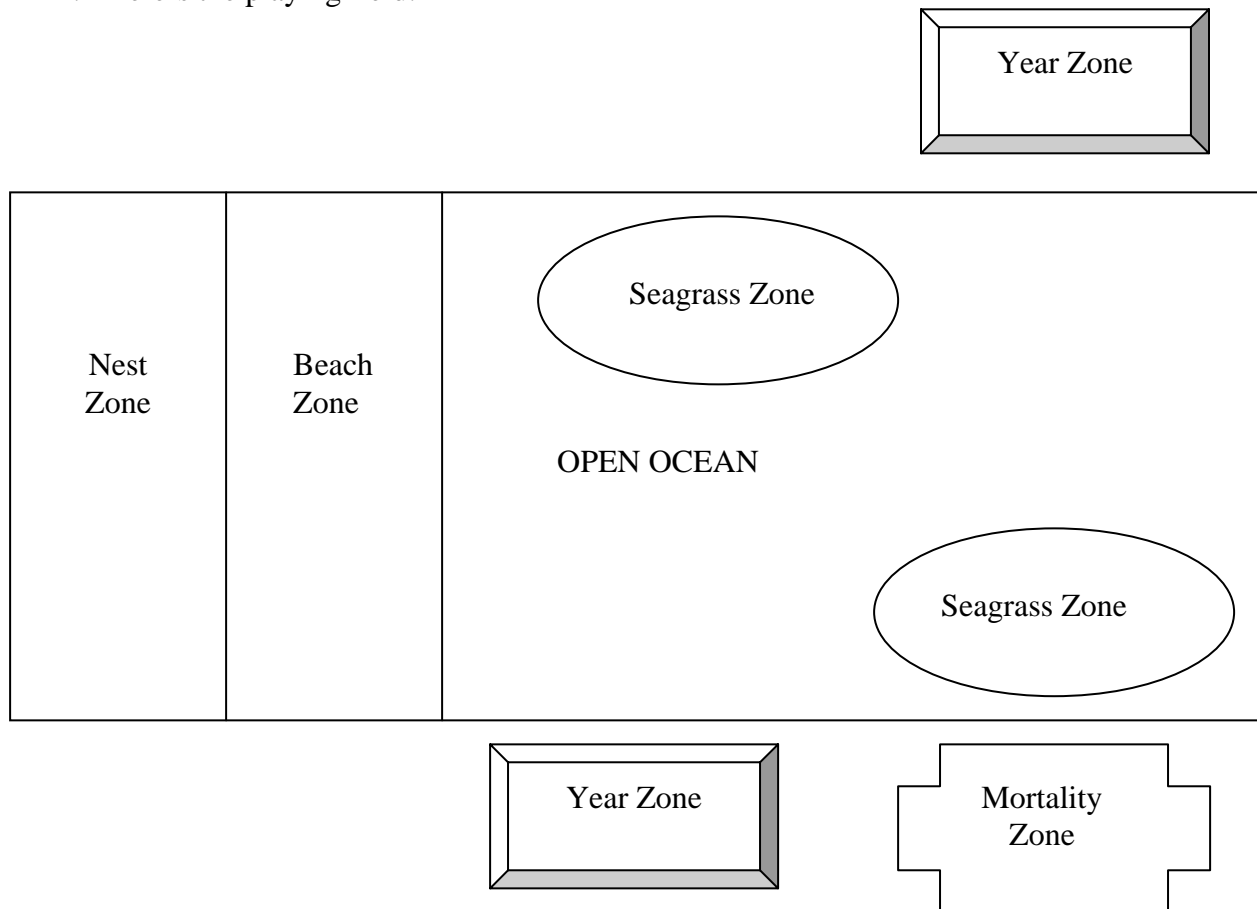
**Focused Question:** What will the survival rate be of the hatchlings? (Students questions will vary, but should address survival rate and/or obstacles to surviving)

**Prediction:** I think the answer to my question is \_\_\_\_\_ (answers will vary)

I predicted this because \_\_\_\_\_ (accept reasonable explanations).

**Procedure & Data Collection:**

1. We did a simulation in which some of us were turtle hatchlings and others were predators or limiting factors.
2. Here's the playing field:



Here are the rules for the game:

- Each turtle receives 100 baby turtle cards.
- Any turtle that loses all 100 turtle cards is dead and must go to the beach zone and become a condominium. If the condominiums (holding hands side by side) eventually block access to the nesting site, the remaining turtles die without reproducing.
- Some of us were limiting factors and were placed in the Beach Zone and Open Ocean.
- Turtles must hatch, cross the beach, spend ten years in the open sea, and return to the nest area to reproduce.
- If the turtle is tagged by a limiting factor they will need to forfeit some of their cards to the limiting factor. The penalties for being tagged in each area are:  
 Beach Zone = 15 cards,  
 Open Ocean under 4 years of age = 10 cards  
 Open Ocean over 4 years of age = 1 card
- Students who are limiting factors must obey the following rules:
  - They cannot tag the same turtle twice in a row
  - After they tag three turtles, they must leave the field and place their turtle cards in the mortality container. Then they can return to play.
  - They cannot tag turtles that are paying out their turtle cards to another limiting factor.
  - They must stay four steps away from any turtle that is finishing off a payment to another limiting factor.
  - Limiting factors cannot tag turtles while going to deposit cards in the mortality container.

Round	Total Turtles Starting	Total Turtles Surviving	% of Survival
1			
2			
3			
4			

**Power Conclusion:**

**(Refer to prediction)** I thought that \_\_\_\_\_

\_\_\_\_\_ .

**(Answer question)** I found out \_\_\_\_\_

\_\_\_\_\_ .

My data shows that \_\_\_\_\_

\_\_\_\_\_ .

**(WHY you got the results you did)** I think \_\_\_\_\_ happened

because \_\_\_\_\_

\_\_\_\_\_ .

**(Error Analysis)** I think \_\_\_\_\_ could

have affected my results because \_\_\_\_\_

\_\_\_\_\_ .

**(Ideas for future research)** In the future, I would like to \_\_\_\_\_

\_\_\_\_\_ .