

Sea Turtle Conservation

Lesson Plan



Introductory Information

Sea turtles are long-lived reptiles adapted to living in the world's oceans. There are seven species of sea turtles, five of which can be found off the coast in Florida's waters – these are the Green, Hawksbill, Kemp's Ridley, Leatherback and Loggerhead sea turtles. They all have evolved specializations to aid in their swimming lifestyles such as streamlined bodies and paddle-like flippers. Sea turtles spend most of their lives in the water making long migrations, feeding, and mating. The diet of sea turtles is varied and includes jellyfish, crustaceans, squid, and sea grasses. Female turtles come ashore on beaches to lay clutches of eggs, usually multiple times during a nesting season. Upon emerging from the nest, hatchlings must find their way to the sea. All species of sea turtle are protected as threatened or endangered under the Endangered Species Act. Threats facing sea turtles include loss of suitable nesting and foraging habitats, artificial lighting, pollution, poaching, incidental capture in fisheries, boat strikes, and disease. Current conservation and management efforts focus on establishing wildlife refuges, reducing incidental bycatch by fisheries, beachfront lighting management, and nest protection.

Grade Levels

Middle School (grades 6-8)

Guiding Questions

1. Which sea turtles can be found nesting on beaches or swimming in the waters of Florida?
2. What are the seven stages of sea turtle nesting? Why is it important to protect and preserve the habitat and nesting and hatching processes of the sea turtle?
3. What does it mean to be endangered? What is extinction and why is it bad?
4. What threats do sea turtles face?
5. What are the goals of sea turtle conservation? What can you do to help?

Learning Objectives

1. Which sea turtles can be found nesting on beaches or swimming in the waters of Florida?
 - Students will be able to *name* and *identify* the 5 species of sea turtles found nesting on beach or swimming in the waters of Florida.
 - Students will *locate* and *draw* the distribution of each Florida species on a world map.

- They will then *analyze* and *compare* the distribution data of each turtle, and *hypothesize* how conservation efforts might be affected by the range of a species.
2. What are the 7 stages of sea turtle nesting? Why is it important to protect and preserve the habitat and nesting processes of the sea turtle?
 - Students will be able to *list* and *describe* the 7 stages of sea turtle nesting.
 - They will *identify* some of the threats sea turtles face during the nesting process.
 - Students will also be able to *summarize* the hatching process, and *discuss* possible threats to sea turtles during the hatching process.
 - The students will *recommend* conservation efforts aimed at addressing the threats they have *identified*.
 3. What does it mean to be endangered? What is extinction and why is it bad?
 - Students will be able to *define* the terms endangered and threatened, and *distinguish* the difference between the two.
 - They will be able to *define* extinction and *explain* the affects of extinction on an ecosystem.
 - The students will be able to *explain* and *describe* the role of a sea turtle in the food web of both beach and ocean ecosystems.
 4. What threats do sea turtles face?
 - Students will be able to *list* and *recognize* both the natural and anthropogenic threats confronted by sea turtles.
 - Students will *investigate* and *model* the effects of fishing by-catch on turtle numbers, *examine* their results, and make *recommendations* for and modify current fishing methods.
 - They will be able to *recommend* conservation efforts which will address threats to sea turtles.
 5. What are the goals of sea turtle conservation? What can you do to help?
 - Students will *create* a short public safety announcement regarding sea turtle conservation.
 - Students will incorporate this lesson's activities and data, prior knowledge from other sea turtle conservation lessons, and current Florida statistics and data on sea turtle nesting in their public safety announcement.
 - Students will now work in groups. They will use their *cooperative learning* roles to share and take responsibility for particular assignments.
 - Scripts will be *written* by groups and reviewed by teacher for approval.
 - Video recorders will be *operated* by students.
 - Videos will be *presented* to the class and whole school.

Sunshine State Standards

Middle School (Grades 6-8)

- ✓ The student understands the need for protection of the natural systems on Earth. (SC.D.2.3)
- ✓ The student understands the competitive, interdependent, cyclic nature of living things in the environment. (SC.G.1.3)
- ✓ The student understands the consequences of using limited natural resources. (SC.G.2.3)
- ✓ The student uses the scientific processes and habits of mind to solve problems. (SC.H.1.3)

Concept Map

See “Sea Turtle Conservation – Concept Map” (separate document)

Vocabulary

anthropogenic, by-catch, camouflage, carapace, carnivore, conservation, conservation biologist, cooperative learning, dichotomous key, distribution, dorsal, ecosystem, endangered, extinction, evolution, food chain, food web, habitat, herbivore, incubation, marine habitat, omnivore, phytoplankton, predator, prey, sargassum, species, TED (turtle exclusion device) terrestrial habitat, threatened, trawling

Materials

See each lesson’s “Teacher’s Page” for a complete list of materials needed for individual lessons.

5-E Model Lesson Plan

Engage

Each daily lesson has an engaging activity called a “starter activity” which incorporates student’s use of prior knowledge and addresses any misconceptions they may have on each topic. Each starter activity is unique and therefore addresses a number of learning styles throughout the “Sea Turtle Conservation” lesson. See the “Teacher’s Page” for each lesson for a more detailed description of the starter activity.

1. Florida Sea Turtles: “*Sea Turtles KWL Chart*” – individually students will activate their prior knowledge by listing what they already know about sea turtles, and with their partners they will share what each of them already knows about sea turtles and construct a collective list of goals on what they would like to know about sea turtles.
2. Nesting and Hatching: “*Sea Turtle ID – Matching Game*” – students will be given images of the 5 sea turtles found in Florida, and 5 pieces of paper with the name and status of each turtle. Students will work in pairs to correctly match the image of the turtle with its name and status. Once the students have become familiar with the images and the correct identifications have been made and verified, conduct a speed round and reward the first team to correctly identify each species of turtle with a piece of candy or turtle sticker, etc.

3. Endangerment and Extinction: *“Nesting and Hatching Crossword Puzzle”* – students will complete a crossword puzzle using key terms and definitions from the previous lesson on nesting and hatching. You may vary the degree of difficulty by using or omitting the word bank provided in the activity.
4. Threats to Sea Turtles: *“Food Web Diagram”* – students will fill in the blanks of the sea turtle food web diagram. Using this diagram they will answer the question “Why is extinction bad?”
5. Goals of Conservation: *“Brainstorm – What can you do to help sea turtles?”* – have the students brainstorm ideas of how they can help protect sea turtles in their area in groups or with partners. Make a comprehensive list of student ideas.

Explore

Each daily lesson has an exploration activity which requires students to utilize prior scientific knowledge and apply the new sea turtle conservation information they have learned. In each exploration activity, students investigate a concept related to sea turtle conservation. Each exploration activity is unique and therefore addresses a number of learning styles throughout the “Sea Turtle Conservation” lesson. See the “Teacher’s Page” for each lesson for a more detailed description of the exploration activity.

1. Florida Sea Turtles: *“Florida Sea Turtles Dichotomous Key”* and *“Where in the World are They?”* – these two exploration activities allow students to identify and distinguish between the different sea turtles and map and locate their distribution areas. In the first activity students create a dichotomous key by using the diagrams and descriptions of each sea turtle. In the second activity, students mark locations of turtle sightings and use descriptions of their travel patterns to color in a map of the world identifying each turtle’s distribution area.
2. Nesting and Hatching: *“Florida Sea Turtle Nesting Data”* – students will locate and color in the counties in which Green, Leatherback and Loggerhead sea turtles nest on a map of Florida. They will then use the most recent nesting data of each sea turtle to create an Excel spreadsheet and graph of the number of nesting sites in Florida for each turtle from 1989 to the present date (or most recent data).
3. Endangerment and Extinction: *“Sea Turtle Food Chains,” “Sea Turtle Food Web Activity,”* and *“Sea Turtle Food Web”* – During the *“Sea Turtle Food Chains”* activity students will construct three food chains, using cut out images of vegetation, predators, prey and turtles, while working with a partner. During the *“Sea Turtle Food Web Activity”* students will play the role of both a hatchling and adult sea turtle as they move from station to station in the room interacting with vegetation, predators, prey, and humans in a classroom-wide food web.
4. Threats to Sea Turtles: *“Artificial Lighting”*- Students will identify areas in Florida with the greatest amount of artificial lighting on a map. They will compare this data to the nesting data and maps they used during the “Nesting and Hatching” lesson. Students will assess whether or not artificial lighting has a significant impact on nesting locations. *“TED Experiment”* – Students will model trawling

fishing methods and their impact on sea turtle populations due to by-catch. Students will design and implement a model TED (turtle exclusion device) and compare the by-catch results to conventional trawling methods.

5. Goals of Conservation: *“What can you do to help protect Florida’s Sea Turtles?”* – students will work in groups on creating a public service announcement regarding sea turtle conservation.

Explain

Informative PowerPoint presentations have been developed to provide essential background information regarding sea turtle conservation. A topic specific PowerPoint presentation has been provided for each daily lesson. See the “Teacher’s Page” for each lesson for recommendations on where within the lesson the PowerPoint presentation should be shown.

Elaborate

The following activities are designed to generate student reflection and expound upon the knowledge that they have learned in the lesson. Many of these activities are considered “closing activities” because they are used to formally review what has been learned in the lesson and wrap up the day’s activities.

1. Florida Sea Turtles: *“Sea Turtles KWL Chart”* - At the end of the first day’s lesson students will return to their KWL charts and discuss with their partners what they have learned about sea turtles; creating a list of what they have learned. They will also review their list of what they knew and check to see if any of their prior knowledge was inaccurate, rewriting these statements if necessary. This can be done as a class discussion or in groups, and allows for the students to address any misconceptions they may have had about sea turtles. Then have students review their list of what they would like to learn. Check off questions that have been answered, and discuss as a class what topics will be covered and therefore which questions will be answered in the upcoming lessons. For homework, you may want students to investigate (using library or internet resources) and answer two questions they have about sea turtles that may not have been answered in today’s lesson – these can be shared with the class at the beginning of the next day’s lesson.
2. Nesting and Hatching: *“Seven Stages of Nesting”* – in this activity students will match the term and definition of each nesting stages together, and place the seven stages of nesting in the order in which they occur. Students should complete this activity with their partner, then discuss as a class the correct definitions and order. A speed round can also be played, similar to the *“Sea Turtle ID – Matching Game”* at the beginning of the day’s lesson.
3. Endangerment and Extinction: *“Sea Turtle Food Web”* - students will draw on their experience from the role-playing activity to construct a food web using the same cut out images as in the *“Sea Turtle Food Chains”* activity, but use additional arrows to create a food web. This activity should be completed in pairs and then discussed as a class.

4. Threats to Sea Turtles: “*Threats to Sea Turtles Concept Map*” – students will complete the concept map, distinguishing the difference between anthropogenic and natural threats, as well as, the difference between threats to hatchling and adult sea turtles.
5. Goals of Conservation: Students will present their public service announcements to the class. After a class vote, the best video will be presented to the whole school during an assembly/lunch period/etc.

Evaluate

All activities offer a number of ways to evaluate student progress. The following are examples of assessment methods used throughout the activities in this lesson plan. (See individual lessons for more information.)

- Analysis questions – student comprehension
- Graph making – demonstrating and understanding of data and its manipulation
- Creating a video – presenting important facts and information
- Essay questions – student comprehension
- Posters – visual representation of information learned
- Experiments – collecting data and relating learned information to applied concept
- Group work – teaching and sharing of information
- Class discussion – oral demonstration of learned information and comprehension

Also see “Answers” worksheets for answers to analysis questions and activities, and “Teacher’s Page” for rubrics.

Supplemental Components

Trade Books

The Biology of Sea Turtles by Peter L. Lutz, et al.

Sea Turtles: A Complete Guide to Their Biology, Behavior, and Conservation by James R. Spotila

Coastal-marine Conservation: Science and Policy by G. Carleton Ray, Jerry McCormick-Ray

Sea Turtles: The Watcher's Guide by M. Timothy O'Keefe

Websites/Technology

Caribbean Conservation Corporation and Sea Turtle Survival League

<http://www.cccturtle.org/>

NOAA Fisheries and Office of Protected Resources

<http://www.nmfs.noaa.gov/pr/species/turtles/>

Florida Fish and Wildlife Conservation Commission

<http://myfwc.com/seaturtle/>

http://research.myfwc.com/features/category_sub.asp?id=2309

The World Conservation Union IUCN Marine Turtle Specialist Group

<http://www.iucn-mts.org/species/>

Ocean Biogeographic Information System - Spatial Ecological Analysis of
Megavertebrate Populations

<http://seamap.env.duke.edu/>

SeaWorld Animals

<http://www.seaworld.org/index.asp>

*See "Teacher's Page" for websites which provide background information for each lesson's activity.

List of technology used for lessons: computers with internet access and connection to projector, Microsoft Excel 2007, and Microsoft PowerPoint 2007

Considerations for Diverse Learners

- Clear large font used for worksheets, including bold print of key words
- All worksheets for class have same format, students know what to expect.
- Cooperative learning groups and roles - assigned
- Working in pairs/Lab partners – assigned
- Visual stimulation through PowerPoint presentations
- Auditory stimulation videos on PowerPoint presentations
- Kinesthetic stimulation with hands-on, modeling and role-playing activities
- Worksheets have allotted writing space and cues
- Basic mathematics and technology skills – data collection, data analysis, graphing
- Artistic skills – drawing and coloring, scriptwriting, videotaping
- Access to Internet – to support language skills, or exceptional learners
- Important dates/responsibilities listed on assignments

Careers Related to Concept:

Sea Turtle Research

Environmental Management

Nature Conservation

Wide variety of non-biological careers (e.g. management, administration, leisure and tourism industry)

Water companies

Coastal authorities

Positions within Government and University research laboratories

Leisure industry

Positions within Non-governmental Organizations

Positions within Museums and Aquariums

