Tour de Turtles: It's a Race for Survival!

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Length of Lesson: Two or more 50-minute class periods.

Intended audience & Topic: Middle school students become increasingly aware of social, political and environmental issues as they learn more about the society in which they live. This awareness can sometimes leave students feeling helpless as they are confronted by seemingly insurmountable problems. For this reason, one of the aims of this lesson is to inform students of the threats to sea turtle survival, while stressing possible solutions for each threat. By presenting environmental problems along with feasible solutions, we can leave students feeling empowered to work towards positive changes to improve the situations they encounter in life.

Concepts:

Sea turtles face many threats to their long-term survival as a species. Individual turtles are seen by many as a source of food and are harvested for their meat, or nests are taken for their eggs. The beautiful shells of Hawksbill sea turtles are often harvested for tourist trade or to be used to make jewelry and other fashion items. Hunting, however, is only one of the major challenges sea turtles face to their survival. Many human activities unintentionally harm sea turtles. For example, using beach areas for entertainment threatens essential nesting habitat for sea turtles. The lights we place around buildings for our safety can cause hatchling turtles to become disoriented as they try to make their way to the ocean. Our pets and other species that associate with humans like raccoons will dig up nests on the beaches to eat the eggs. The boats we use for pleasure and work may be fatal to a sea turtle that is struck by a passing propeller. Even activities like beach re-nourishment, meant to help beaches recover from erosion, can upset the natural texture and composition of the beach sand, making it unsuitable for sea turtle nesting.

Many land-based activities that seem to have nothing to do with the ocean also lead to negative consequences. Plastic bags are used for almost every kind of shopping here on land. The problem is that many of the plastic items we discard find their way into the ocean. A plastic bag in the ocean looks very much like jellyfish or other swimming food to a sea turtle, and poses a serious choking hazard. Agricultural activities that rely upon pesticides and fertilizers also lead to runoff of polluted water into the ocean. The chemicals in this runoff can harm coral reefs, sea grass beds and estuary ecosystems, which are all important feeding habitats for sea turtle species. That delicious sea food dinner you order in a restaurant may have been harvested by trawl or long line fisheries. Industrial fishing techniques like these often accidentally catch sea turtles and other "by catch" along with the target species.

Finally, the overall change in our global climate is already showing a negative impact on sea turtles. Rising sea levels are leading to the loss of sandy beach habitat. Combined with an increase in severe tropical storm activity, this is causing many of the nesting beaches that sea turtles rely upon to be at risk of shrinking or altogether disappearing. Increasing incubation temperatures caused by warmer weather will impact the percentage of males and females hatching from nests, which will also have a negative affect of sea turtle survival.

This sounds like a great deal of bad news, however there are many reasons to hold out hope. Many concerned people are working to counteract these threats by raising awareness of the needs of endangered species like sea turtles. By providing alternatives to hunting, enforcement of international treaties banning trade in sea turtle products and working with local organizations to provide better education about endangered species, conservation groups like the Sea Turtle Conservancy are making a positive impact on the future of the world's sea turtle species.

Florida State Standards (NGSSS) and Common Core State Standards (CCSS) with Cognitive Complexity:

Benchmark Number	Benchmark Description	Cognitive Complexity
LACC.6.SL.1.1a	Come to discussions prepared, having read or studied required material; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.	Level 3: Strategic Thinking & Complex Reasoning
LACC.6.SL.2.5	Include multimedia components (e.g., graphics, images, music, sound) and visual displays in presentations to clarify information.	Level 2: Basic Application of Skills & Concepts
SC.7.L.17.3	Describe and investigate various limiting factors in the local ecosystem and their impact on native populations, including food, shelter, water, space, disease, parasitism, predation, and nesting sites.	Level 3: Strategic Thinking & Complex Reasoning

This lesson plan was funded by a grant awarded from the Sea Turtle Grants Program. The Sea Turtle Grants Program is funded from proceeds from the sale of the Florida Sea Turtle License Plate. Learn more at http://www.helpingseaturtles.org

Performance Objectives: *Students will be able to*:

- Use a given text to gather information about a specific sea turtle threat, creating a summary of the most important points to share with their peers.
- Design and implement a presentation including information, visual aids and other elements that will transmit the information on an assigned topic in an informative and engaging manner.
- Describe the specific details using evidence from readings of a particular threat to sea turtle survival.
- Offer potential solutions that could be used to overcome the problems caused by the particular threat investigated.

Materials List and Student Handouts

- Computer access for each group that allows students to access the Tour de Turtles website, specifically the links from: http://www.tourdeturtles.org/causes.php
- If computers are not available, you may print out the information for each cause from the Tour de Turtles Website (see link above)
- One handout per student. Members of each group should get the handout page specific to their group's threat.
- Supplies needed for group presentations such as markers, poster boards or butcher paper, etc.

Advance Preparations

- Determine how you will assign students to groups. There are eleven different issues addressed by the Tour de Turtles. You may use all eleven or select a smaller number of issues (or some may be combined: such as eggs & meat for consumption)
- If computer access is not available, the issue information may be printed for each group from the Tour de Turtles website: http://www.tourdeturtles.org/causes.php
- Gather any supplies students may need to use as they prepare their presentations (poster boards, markers, etc.)

Safety

- Any time students are using internet-connected computers, it is important to monitor them closely to ensure that they are only viewing educationally appropriate websites. Students should not leave the Tour de Turtles website for any part of this lesson.

5E Lesson:

Engagement

- Show short video from link: http://vimeo.com/67828315 highlighting 9 of the world's most endangered species (ppt. slide 2).
- Lead a short discussion with the class to introduce the idea of "what does it mean to be an endangered species?" and "what causes a species to become endangered or extinct?"
- Ask the students to try to think of as many things as they can that might lead to a species becoming endangered. Through questioning students, try to include the following ideas in the discussion: The life history of a particular organism (how long it lives, how often it reproduces & how many offspring, How varies is it's diet, how flexible is it in habitats, etc…)
- Bridge to exploration by telling students that today they will be learning more about the specific threats that face one of the types of animals in the video they watched; sea turtles.

Exploration

- Ask students if they know how many species of sea turtle exist.
- If needed, give a brief overview of the life cycle of a sea turtle-including the following (see ppt. slide 3 for visual):
    - Sea turtles are air-breathing reptiles that live their entire life in the ocean water.
    - The only time they leave the water is when females come back to the beach where they were hatched to lay a nest of eggs.
    - The eggs are buried deep in the sand where they will incubate for 55-65 days depending on species (the temperature of the sand affects whether eggs will develop to be male or female turtles- deeper cooler sand results in males, shallower, warmer sand results in females).
    - Hatchling sea turtles use the light of the moon to guide them to the ocean where they will live and feed for 20 years or more before they become mature adults.
    - Once they reach adulthood, males and females find each other offshore to mate, then the cycle begins again with females returning to shore to nest.
    - More information available at http://conserveturtles.org/sea-turtle-information.php?page=overview
- Break students into their groups. Each student should be given a handout that is specific to the threat his or her group will research.
- Using the Tour de Turtles Website, http://www.tourdeturtles.org/causes.php students will research their threat and complete the table on their handout.

Explanation

- Once each group has completed their research they will begin to brainstorm ideas about how to best present their information to their peers. Some possible ideas include:
    - **Public awareness campaign at the school**. Each group makes a poster that will be hung around the school to raise student awareness across campus.
    - **Small group presentations within the classroom**. Students may present a ppt, song or other presentation for classmates.
    - **School's Open House**: this is a great activity to do prior to your school's open house. Students can then present their findings to parents and community members who

visit the classroom during open house. If students can not attend open house, they could design self explanatory displays to inform parents. (A great twist is to have parents rate student work as part of the evaluation process- try to keep names hidden to reduce bias).

Elaboration

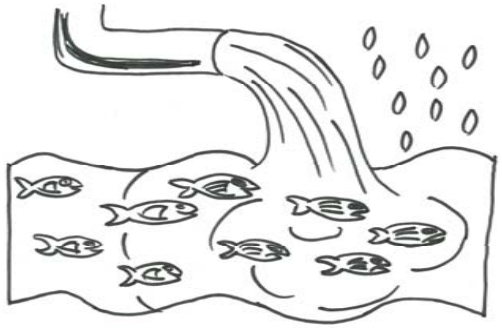
Follow the track of the turtle swimming to raise awareness for your group's threat!

- Each of the threats that students will investigate has one or more satellite tracked turtles "swimming for the cause." As a class, students can follow their turtle's progress throughout the Tour de Turtles race to see where their turtle swims, and which turtle will complete the marathon first.

Evaluation

For group work, a very effective method of evaluation is to assign a combination of group and individual grade. The whole group should be judged on the depth of understanding and quality of presentation completed. In addition, It is often useful to incorporate student peer evaluations by having other class members assess each presentation. Anonymous peer evaluations within individual groups can also reveal a great deal about individual student effort and concept development.

Water Quality



The turtle swimming for this cause is:_____

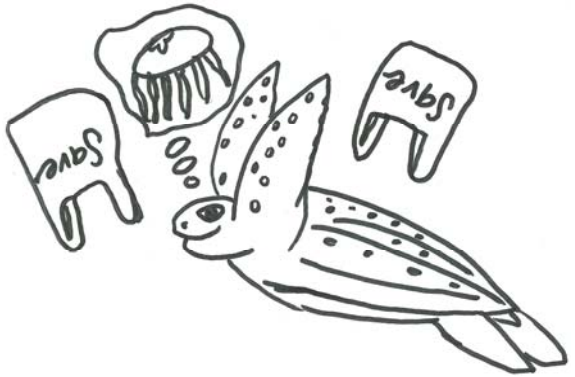
Describe the Problem	
Species Affected	
The Solution	
Case Study	

Invasive Species

The turtle swimming for this cause is:_____

Describe the Problem	
Species Affected	
The Solution	
Case Study	

Plastic Debris



The turtle swimming for this cause is:_____

Describe the Problem	
Species Affected	
The Solution	
Case Study	

Light Pollution

The turtle swimming for this cause is:_____

Describe the Problem	
Species Affected	
The Solution	
Case Study	

Meat for Consumption

The turtle swimming for this cause is:_____

Describe the Problem	
Species Affected	
The Solution	
Case Study	

Climate Change

The turtle swimming for this cause is:_____

Describe the Problem	
Species Affected	
The Solution	
Case Study	

Trawl Fisheries

The turtle swimming for this cause is:_____

Describe the Problem	
Species Affected	
The Solution	
Case Study	

Eggs for Consumption

The turtle swimming for this cause is:_____

Describe the Problem	
Species Affected	
The Solution	
Case Study	

Illegal Shell Trade

The turtle swimming for this cause is:_____

Describe the Problem	
Species Affected	
The Solution	
Case Study	

Beach Renourishment

The turtle swimming for this cause is:_____

Describe the Problem	
Species Affected	
The Solution	
Case Study	

Boat Strikes

The turtle swimming for this cause is:_____

Describe the Problem	
Species Affected	
The Solution	
Case Study	