Sea Turtle Food Webs

National Education Standards:

- HS-LS2-6: Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem. Students will create food webs which show how energy flows through organisms within an ecosystem. They will then discuss how changes to this food web can disrupt an ecosystem.

Grade Level: 9th, 10th, 11th, and 12th Grade

Subject Area: Science

Lesson Duration: Two 50 minute class periods

Objectives:

- Students will utilize research skills to develop a food web for one of 7 sea turtle species.
- Students will analyze the interconnectedness of various species.

Teacher Information:

This lesson can be used to teach your students the basics of food webs. Prior to this lesson, students should be taught the basics of food chains, trophic levels, and energy flow. Additionally, the students should be made aware that the arrows represent the flow of energy through the given ecosystem, not based upon who is eating whom, as many students tend to think.

The following are key concepts that students should understand.

- All energy is derived directly or indirectly from the sun.
- In a food chain and a food web, the arrows show the direction in which energy flows.
- Organisms are generally classified as producers or consumers; consumers can be broken into herbivores (eats only producers), omnivores (eats producers and consumers), or carnivores (eats only consumers).
- An organism's trophic level is its position within a food chain or web.

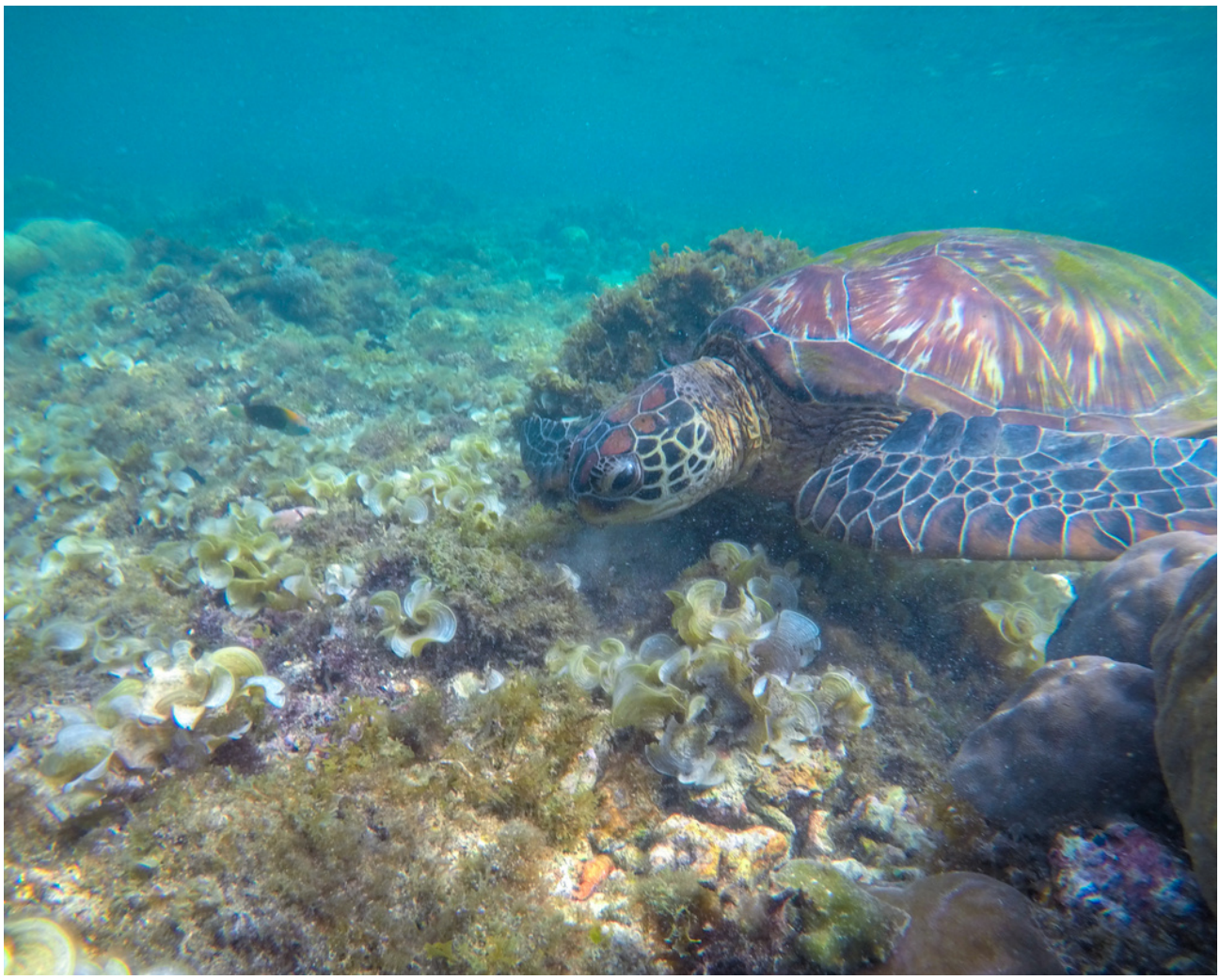
The lesson gives the teacher basic guidelines for the structure of a food web. It will be up to the teacher's discretion as to the specific format the students should use when creating their own. The lesson gives options for differentiation, depending upon the level of the students. Level one gives the students a list of organisms for each sea turtle species, forcing the students to construct the web from scratch in addition to researching the trophic level for each species. Level two asks that the teacher only give the students the name of a sea turtle species; the students do all the work from there. Included with the directions are websites that will be helpful to the students when researching organisms for the web.

Materials:

- Books, printed resources, or computers with internet access
- Sea Turtle Food Web Worksheet (provided)

Warm-up (10 minutes):

- Begin the lesson by asking the students if they have ever seen or learned about sea turtles. Allow a few volunteers to share their experiences.
- Tell students that today we are going to learn about food webs today using sea turtles as the model. Ask the class for a volunteer to explain what a food web is.
    - A food web shows how matter and energy from food are transferred from one organism to another. Food webs show how organisms are intertwined in an ecosystem.



Food Webs (45 minutes):

Ask the students to generate some ideas as to what sea turtles eat and what organisms eat sea turtles.

Split the class into seven groups and assign one sea turtle species to each group: Green, Loggerhead, Hawksbill, Olive Ridley, Leatherback, Flatback, or Kemp's Ridley. Each group will create a food web for their individual species of sea turtle.

From here, you will need to determine which Sea Turtle Food Web Worksheet to provide to each group.

- Level One
  - Group(s) using the Level 1 worksheets will be given a list of organisms involved in a food web for their assigned species. They should use the website list or resources to research organisms to see how they fit into their web.
- Level Two
  - Students using the Level 2 worksheets are given no additional resources other than the name of a turtle species and the list of websites or resources provided.

Students should generate a final food web to present or place on display for the class. The food webs should be posted somewhere visible if other Sea Turtle lessons are to be used.

Note: It will be up to the teacher to decide if each organism within the web should be able to trace their energy to a producer. The provided web resources focus only on the organisms involved in providing energy to the turtles or eating the turtles. Teachers may also have the students research the additional connections within the web (i.e. – zooplankton eating phytoplankton and other zooplankton).

Have each group present their food web to the class. Prompt students to discuss similarities and differences between their food webs

Extensions:

Ask the students to discuss, within their groups, examples of possible impacts on their food chains.

Conclusion (30 minutes):

- By studying the food webs generated by the student, some may realize that the loss of a turtle species could disrupt an ecosystem. Ask students how the loss of sea turtles could impact an ecosystem. For example, the hawksbill species is a keystone species who eats many common sponges, allowing rarer ones to populate where they would otherwise not survive. Also, prompt students to consider what may happen if the sea turtles lose an important food source in their ecosystem.

Extensions:

- Have students create food webs for a marine animal of their choice.
- Prompt students to consider how other matter may flow through an ecosystem such as toxins or poisons. For example, the hawksbills species tend to eat sponges that contain poisons, causing some turtles to become poisonous themselves.
- Invite a local marine biologist or sea turtle conservationist to speak to the class in person or virtually.
- Organize a field trip to a local aquarium or sea turtle rescue center.

Assessment:

- Review the Sea Turtles Food Web Worksheets completed by the students to assess the research completed by the students. The arrows should represent the energy flow. The organisms should be placed into the correct trophic level. Students using level three should have the correct species of organism linked within their food chain.

Resources:

- **Flatback:**
  - www.seaturtleweek.com/flatback-day
  - www.conserveturtles.org/information-about-sea-turtles-flatback-sea-turtle/
  - www.seeturtles.org/flatback-turtle

- **Hawksbill:**
  - www.seaturtleweek.com/hawksbill-day
  - www.fisheries.noaa.gov/species/hawksbill-turtle
  - www.seeturtles.org/hawksbill-turtles
  - www.conserveturtles.org/information-about-sea-turtles-hawksbill-sea-turtle/

- **Kemp's Ridley:**
  - www.seaturtleweek.com/kemps-ridley-day
  - www.fisheries.noaa.gov/species/kemps-ridley-turtle
  - www.conserveturtles.org/information-about-sea-turtles-kemps-ridley-sea-turtle/
  - www.seeturtles.org/kemps-ridley-turtles

- **Green**
  - www.seaturtleweek.com/green-turtle-day
  - www.fisheries.noaa.gov/species/green-turtle
  - www.conserveturtles.org/information-sea-turtles-green-sea-turtle/
  - www.seeturtles.org/green-sea-turtle

- **Olive Ridley:**
  - www.seaturtleweek.com/olive-ridley-day
  - www.conserveturtles.org/information-about-sea-turtles-olive-ridley-sea-turtle/
  - www.fisheries.noaa.gov/species/olive-ridley-turtle
  - www.seeturtles.org/olive-ridley-turtles

- **Leatherback:**
  - www.seaturtleweek.com/leatherback-day
  - www.seeturtles.org/leatherback-turtle
  - www.fisheries.noaa.gov/species/leatherback-turtle
  - www.conserveturtles.org/information-about-sea-turtles-leatherback-sea-turtle/

- **Loggerhead:**
  - www.seaturtleweek.com/loggerhead-day
  - www.seeturtles.org/loggerhead-turtles
  - www.fisheries.noaa.gov/species/loggerhead-turtle
  - www.conserveturtles.org/information-sea-turtles-loggerhead-sea-turtle/

- **General:**
  - www.noaa.gov/education/resource-collections/marine-life/aquatic-food-webs
  - www.americanoceans.org/facts/what-do-crabs-eat/
  - www.americanoceans.org/facts/what-do-jellyfish-eat/
  - www.americanoceans.org/facts/what-does-coral-eat/

These materials are provided by SEE Turtles. SEE Turtles helps save sea turtles through conservation tours, supporting important nesting beaches, working to end demand for turtleshell, helping clean up plastic waste from turtle habitats, educating people about how to help these animals, and promoting inclusivity in the turtle community. For lesson plans, fundraising ideas, online presentations, and field trips, please visit www.seeturtles.org/schools. For more information, please contact Brad Nahill, SEE Turtles Director, at brad@seeturtles.org or 5800-215-0378.

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Name: _____ **Date:** _____

Sea Turtle Food Webs Worksheet - Level 1

Directions: Using the word bank, website list or resources, research how organisms fit into this sea turtle species food web.

Green Sea Turtle

Shark	**Seagrass**	**Fish**
Octopus	**Crab**	**Algae**

Name: _____ **Date:** _____

Sea Turtle Food Webs Worksheet - Level 2

Directions: Using only the name of the sea turtle species, create the food web of the species using the website and resources provided.

Green Sea Turtle

Name: _____ **Date:** _____

Sea Turtle Food Webs Worksheet - Level 1

Directions: Using the word bank, website list or resources, research how organisms fit into this sea turtle species food web.

Hawksbill Sea Turtle

Shark	**Coral**	**Sea Urchin**
Crab	**Shorebird**	**Algae**

Name: _____ **Date:** _____

Sea Turtle Food Webs Worksheet - Level 2

Directions: Using only the name of the sea turtle species, create the food web of the species using the website and resources provided.

Hawksbill Sea Turtle

Name: _____ **Date:** _____

Sea Turtle Food Webs Worksheet - Level 1

Directions: Using the word bank, website list or resources, research how organisms fit into this sea turtle species food web.

Loggerhead Sea Turtle

Shark	**Algae**	**Conch**
Crab	**Shorebird**	**Eagle Ray**

Name: _____ **Date:** _____

Sea Turtle Food Webs Worksheet - Level 2

Directions: Using only the name of the sea turtle species, create the food web of the species using the website and resources provided.

Loggerhead Sea Turtle

Name: _____ **Date:** _____

Sea Turtle Food Webs Worksheet - Level 1

Directions: Using the word bank, website list or resources, research how organisms fit into this sea turtle species food web.

Kemp's Ridley Sea Turtle

Shark	**Dolphin**	**Algae**
Jellyfish	**Plankton**	**Shrimp**

Name: _____ **Date:** _____

Sea Turtle Food Webs Worksheet - Level 2

Directions: Using only the name of the sea turtle species, create the food web of the species using the website and resources provided.

Kemp's Ridley Sea Turtle

Name: _____ **Date:** _____

Sea Turtle Food Webs Worksheet - Level 1

Directions: Using the word bank, website list or resources, research how organisms fit into this sea turtle species food web.

Olive Ridley Sea Turtle

Shark	**Shorebird**	**Algae**
Fish	**Seagrass**	**Crab**

Name: _____ **Date:** _____

Sea Turtle Food Webs Worksheet - Level 2

Directions: Using only the name of the sea turtle species, create the food web of the species using the website and resources provided.

Olive Ridley Sea Turtle

Name: _____ **Date:** _____

Sea Turtle Food Webs Worksheet - Level 1

Directions: Using the word bank, website list or resources, research how organisms fit into this sea turtle species food web.

Flatback Sea Turtle

Shark	**Shorebird**	**Algae**
Soft Corals	**Sea Cucumber**	**Crab**

Name: _____ **Date:** _____

Sea Turtle Food Webs Worksheet - Level 2

Directions: Using only the name of the sea turtle species, create the food web of the species using the website and resources provided.

Flatback Sea Turtle

Name: _____ **Date:** _____

Sea Turtle Food Webs Worksheet - Level 1

Directions: Using the word bank, website list or resources, research how organisms fit into this sea turtle species food web.

Leatherback Sea Turtle

Shark	**Shorebird**	**Algae**
Jellyfish	**Plankton**	**Sea Urchin**

Name: _____ **Date:** _____

Sea Turtle Food Webs Worksheet - Level 2

Directions: Using only the name of the sea turtle species, create the food web of the species using the website and resources provided.

Leatherback Sea Turtle