Virtual Field Trip On Board the Schooner SoundWaters
Teachers Guide and Supporting Materials

Welcome to the SoundWaters Virtual Field Trip on board the 80' SoundWaters.

This Virtual Field Trip focuses on the animals of the Long Island Sound. The adventure begins with SoundWaters Educator Jess Castoro on the deck of the schooner, and Jess narrates the experience for students. Throughout the Field Trip other SoundWaters Educators present compelling videos about topics such as the food chain, animal digestion, circulatory systems, aquatic movement and animal senses. To help you organize your lesson plan the order of the presentation and the start and end time of each section, along with the relevant NGSS standards, are listed below.

Also below are resources that you may choose to use with your students. Specifically you will find:

- Field trip video link: bit.ly/VFT135
- Worksheets to reinforce the material presented in the Field Trip.
- A sample quiz
- A quiz answer key
- Links to an app and online resources that students can use to enhance their knowledge.
- Links to additional articles and readings to help your students learn more about the animals of Long Island Sound.

We trust you will find this Virtual Field Trip to be a valuable learning tool for your students and a terrific way to connect them with the natural world. If you would like to pursue this subject matter in a more significant way please reach out to us to discuss bringing a SoundWaters Educator into your classroom via videoconference. We can customize a program that will support you desired learning outcomes for your students. For more information please contact Olena Czebiniak at olena@soundwaters.org or 203-406-3319.

Content, Timing and NGSS Standards

Food Chain

- Start – 2:36
- End – 12:46
- NGSS – Matter and Energy in Organisms and Ecosystems: 5-PS3-1, 5-LS2-1

Digestive System

- Start – 12:57
- End – 17:32
- NGSS – Structure, Function and Information Processing: 4-LS1-1

Circulatory System

- Start – 17:49
- End – 24:26
- NGSS – Structure, Function and Information Processing: 4-LS1-1

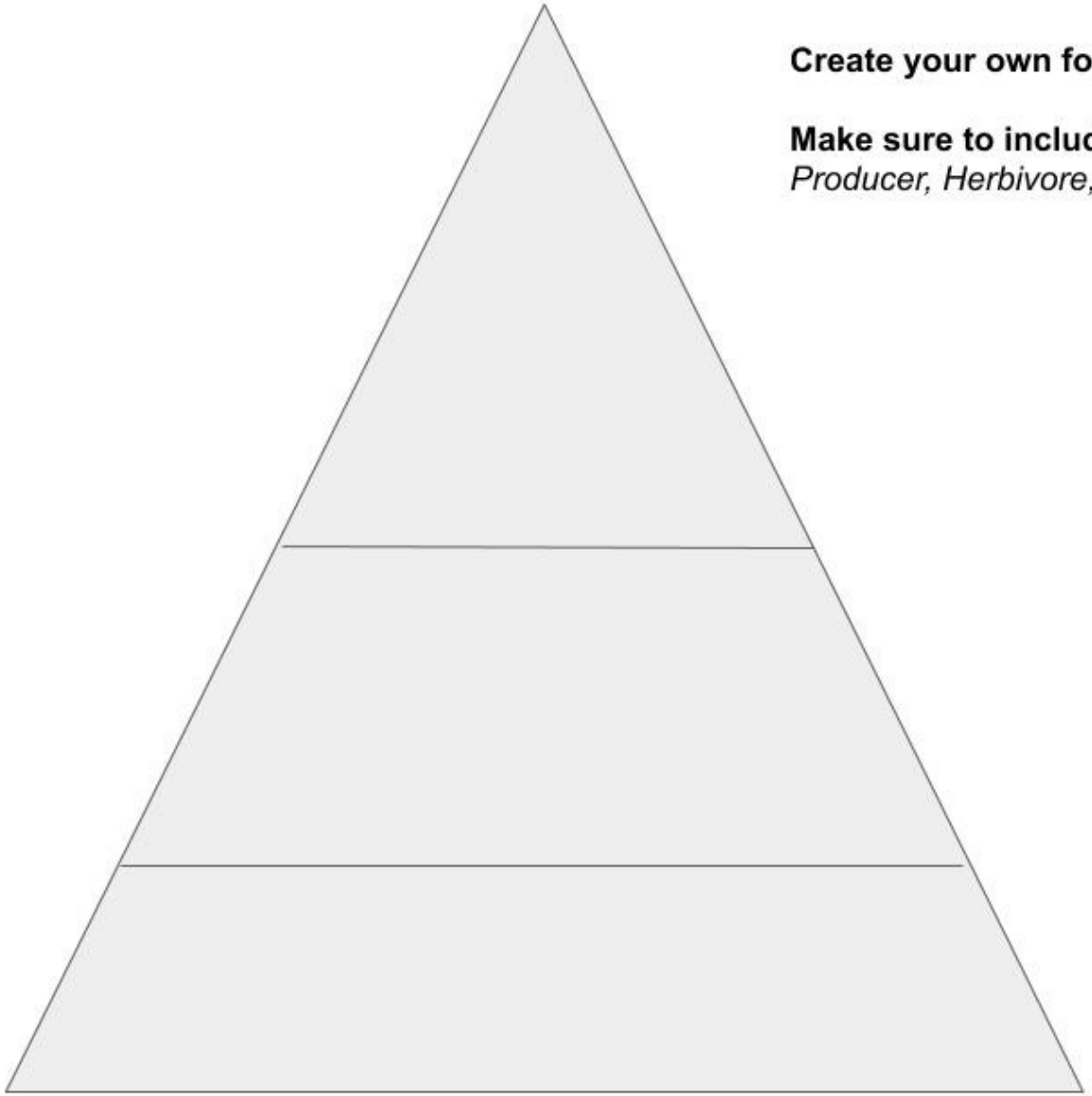
Aquatic Movement

- Start – 24:44
- End – 30:19
- NGSS – Structure, Function and Information Processing: 4-LS1-1

Animal Senses

- Start – 30:39
- End – 36:18
- NGSS – Structure, Function and Information Processing: 4-LS1-1, 4-LS1-2

FOOD CHAIN



Create your own food chain of animals that live on LAND.

Make sure to include the following words for each level
Producer, Herbivore, Carnivore (hunter), Carnivore (scavenger)

What would happen if there were too many animals at the top of the food chain?

Name: _____

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THE DIGESTIVE SYSTEM

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In the video you learned that animals have specialized structures that help them break down their food so they can get the nutrients they need to stay alive. **Fill in the boxes below about the seastar and horseshoe crab.**

The seastar has a very small mouth, so to help it get food, it has…….

The horseshoe crab does not have any teeth on the outside, so to break down its food……..

THE CIRCULATORY SYSTEM

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Compare and contrast the circulatory system of a human and a horseshoe crab by dragging the phrases into the correct box

JUST HUMANS	BOTH	JUST HORSESHOE CRABS

Closed circulatory system

Oxygen

Amoebocyte

Heart

Open circulatory system

Arteries and Veins

Iron based blood

Blue blood

Blood that clots

Red blood

Copper based blood

What does the circulatory system help to transport throughout an organism's body?

ANIMAL MOVEMENT

What are some animals that can **ONLY WALK**	What are some animals that can **ONLY SWIM**	What are some animals that can **BOTH SWIM AND WALK**
Do all animals walk the same way? Give some examples	Do these animals use the same body part to swim? Explain how the animals uses that body part to move.	Why would an animal need to move in multiple ways? Give an example to explain.

List **five** animals that have webbed feet:

Name: _____

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ANIMAL SENSES

All animals do not use the same types of body parts to help with their five senses. Give some examples of how animals touch, taste, hear, smell and see differently than humans do.

TOUCH	TASTE	HEARING	SMELL	SIGHT
Ex: humans - hands	Ex. humans - tongue	Ex. humans - ears	Ex humans - nose	Ex. Humans - Eyes

Which of your senses would be most important to you if you lived in the water? Explain your answer.

An animal like a seastar does not have eyes to see images. How would seeing changes in light/shadows protect them from a predator?

Name: _____

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TEST YOUR KNOWLEDGE

1. Where do benthic animals live in Long Island Sound?
    a. Swimming around in the water column
    b. Floating at the top of the water
    c. Living at the bottom
    d. All of the above

2. Which part of the trawl net helps to bring animals off the bottom so they can get caught in the net?
    a. Floats
    b. Tickle Chain
    c. Cod end
    d. Trawl boards

3. Which of these is the correct order of the food chain from bottom to top?
    a. Carnivore; Producer; Herbivore
    b. Herbivore; Producer; Carnivore
    c. Producer; Herbivore; Carnivore
    d. Producer; Carnivore; Herbivore

4. How do phytoplankton get their energy/food?
    a. By eating zooplankton
    b. By using sunlight to make food
    c. By breaking down other animals
    d. By filtering out pollution

5. _____ use tube feet and push out their stomach when digesting their food.
    a. Horseshoe crab
    b. Clam
    c. Seastar
    d. Plankton

6. Which of these statements about food chains is FALSE?
    a. If you remove one type of living thing from the food chain, the other living things would not be affected.
    b. There needs to be a certain number of predators and prey to keep the food chain balanced.
    c. There are a greater number of living things at the bottom of the food chain and a smaller number at the top of the food chain.
    d. A food chain contains all the living things in an area.

7. Which of the following is TRUE about digestion in seastars?
    a. The seastar's stomach is at the end of its tube feet, which are on the outside of the body.
    b. Seastars are able to eat food much larger than they are by using external digestion.
    c. The seastar uses one stomach to digest its food.
    d. Seastars digest their food very quickly.

8. The _____ is responsible for grinding up the food in animals like a horseshoe crab.
    a. Gizzard
    b. Teeth
    c. Crop
    d. Chelicerae

9. True or False. Carnivores have a longer digestive system than herbivores because they eat material that is more fibrous and harder to break down.

10. The circulatory system transports _____ around the body.
    a. Gasses
    b. Nutrients
    c. Blood
    d. All of the above

11. Fill in the blanks. Animals like a horseshoe crab have a(n) _____ circulatory system because _____.
    a. Closed; their blood has to travel very far away from the heart to get to all the organs.
    b. Closed: their blood does not have very far to travel from the heart to get to all the organs.
    c. Open; their blood does not have very far to travel from the heart to get to all the organs.
    d. Open; their blood has to travel very far away from the heart to get to all the organs.

12. Why is it important for the horseshoe crab's blood to clot?
    a. The clot protects the horseshoe crab from bacteria in their blood.
    b. The clot helps move food around the body.
    c. The clot captures oxygen from the water.
    d. The clot helps the horseshoe crab get copper into its blood.

13. Which of these adaptations is most important to help the diamondback terrapin move on land?

    a. Webbed feed

    b. Flippers

    c. Swimmerets

    d. Nails

14. True or False. Clams use a mucus raft to move along the ground in the rocky shore.

15. Which of these statements is TRUE about the horseshoe crab's senses?

    a. They taste the water with a tongue to detect changes in the water.

    b. They touch the ground with their tail to locate food and predators.

    c. They hear with their gills.

    d. They have two types of eyes, compound and sensory.

16. Fish use their _____ to help detect water pressure and swim in schools.

    a. Antennae

    b. Lateral line

    c. Swimmerets

    d. Dorsal line

TEST YOUR KNOWLEDGE ANSWERS

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Apps and Online Resources

(Click on the title to learn more!)

- iNaturalist
    - Download this app to contribute to science! Become a citizen scientist and use the app to record and share all your encounters with nature. iNaturalist helps you identify the plants and animals around you. By recording and sharing your observations, you'll create research quality data for scientists working to better understand and protect nature.
- Food chain game
- Horseshoe crabs and the full moon
- Horseshoe crab facts
- Invertebrate facts
- Plankton in the Arctic
- Invent an animal

Books and Readings

Books

- **Manfish: A Story of Jacques Cousteau** by Jennifer Berne
- **Ocean Meets Sky** by Terry Fan
- **The Octopus Scientists: Exploring the Mind of a Mollusk** by Sy Montgomery

Articles (Click on the title to open the article)

- Marine Food Chains (Lexile level is adjustable)
- Motion in the Ocean: Big or small, sea animals are in step.