

WORLD – Unit 1 of 8 Ocean Food Webs



Explore an underwater forest!

Create a food web using Sphero to show the transfer of energy within an underwater ecosystem. Find out what sea otters eat and what eats them.

Discover the importance of sequencing when designing food webs and writing algorithms.

LEARNING OBJECTIVES:

- I can explain and model sequencing
- I can describe the interdependence of organisms in a food web.
- I can write an algorithm to move Sphero along a food web.

Tags: water science world history coding animals biology
ecology life science block coding

Grades: 5 to 9 | **Duration:** Up To 1 Hour

CCSS: CCSS.ELA-Literacy.CCRA.W.3

Key Stages: Computing.KS3.1, Science.KS3.B1

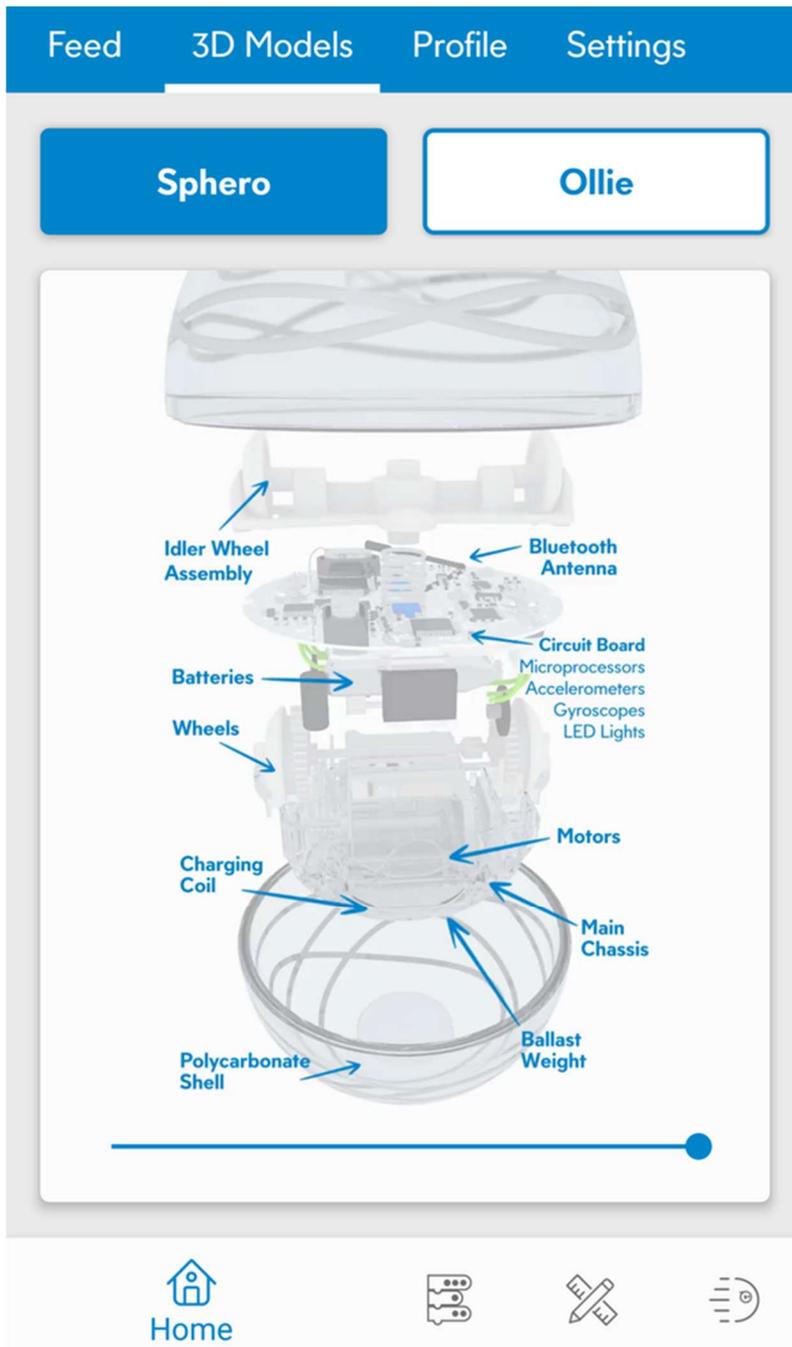
NGSS: 5-LS2-1, 5-PS3-1, MS-LS2-5

Supplies: Large sheets of paper and pens.

Step #1: Exploration - Meet Sphero

Explore the Sphero Edu app. *Are you able to locate the 3D models?* Ask a friend if you are unable to find them.

The 3D models allow you to see the inner workings of a SPRK+ robot. *Can you find the Bluetooth antenna in the model and match it on your robot? Can you find the battery?*



Educator Tip:

Give students 10 minutes to explore and then have them share out.

1. The different parts of Sphero or Ollie
2. Describe what the parts do for the robot
3. Why they think each part is important

Step #2: Exploration - Food webs

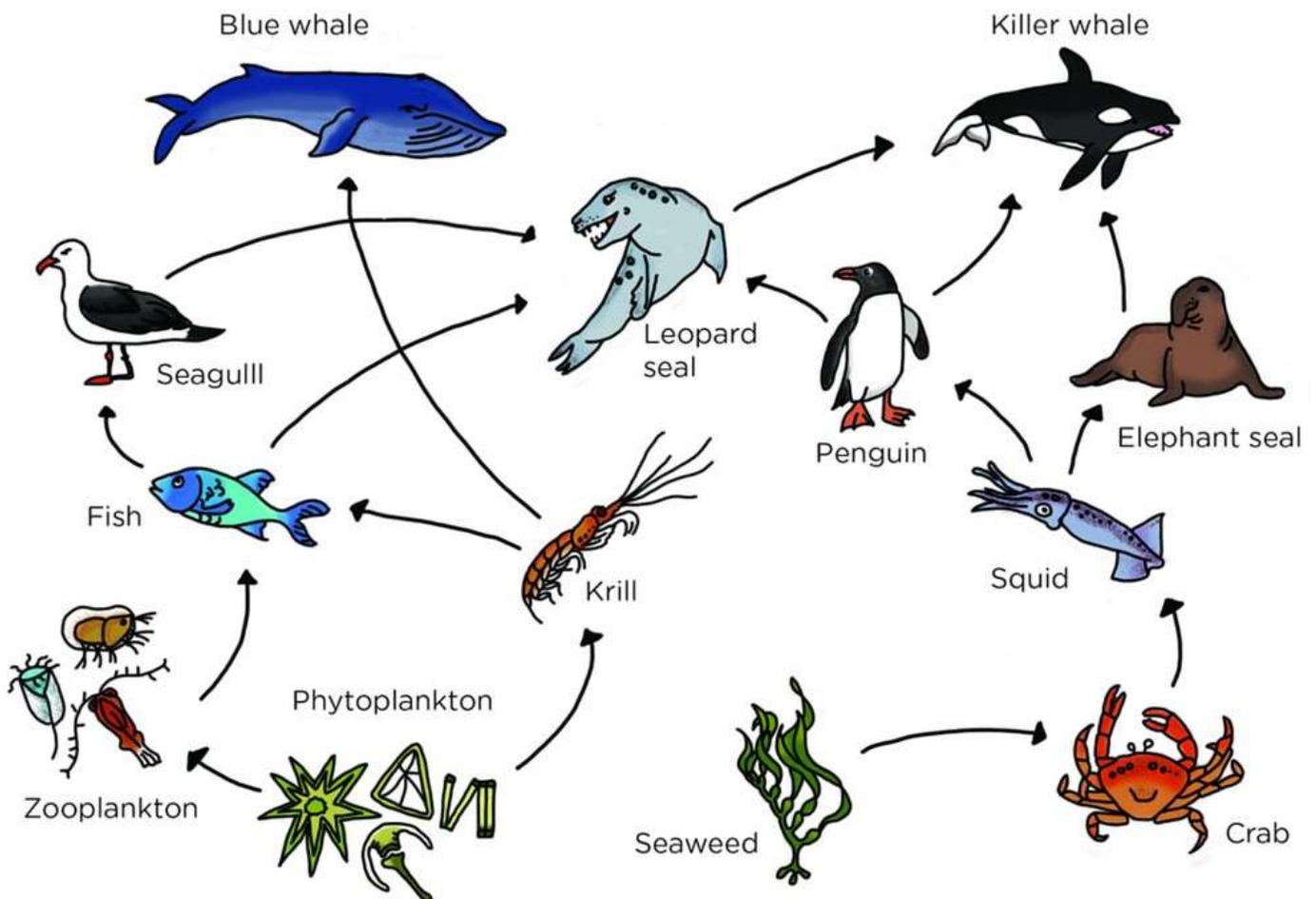
Work in pairs to come up with a definition of a food chain. Share with the rest of the class and decide on a single definition.

1. Which way do the arrows point in a food chain?
2. How are food chains and food webs related? (Hint: look at the image below)

The image below is a food web. The direction of the arrows is the same as the arrows in a food chain; they show the transfer of energy from one organism to another. For example, when the squid eats the crab, the crab's energy is transferred to the squid.

The order, or sequence, that the organisms appear in the food web is essential. *What would happen if you put the shark at the bottom?*

The proper sequencing, or algorithm, is also essential in programming. *Can you describe how sequencing in food webs and in programming is similar?* Explain it to your partner using the word "algorithm."



Educator Tip:

Have students write how sequencing in food webs and in programming are similar. Make sure as they talk about programming they are using algorithm appropriately.

Step #3: Exploration - Underwaterworld

Watch the video attached of an underwater ecosystem.

1. *How high does the kelp grow?*
2. *How many organisms are connected in this food web?*

Kelp is the producer in this ecosystem. *What examples of consumers did you see?*

Explain how the sea otters, crabs, sea stars and urchins depend on each other to survive.

YouTube video: <https://youtu.be/LVJ5BKcAhAg>

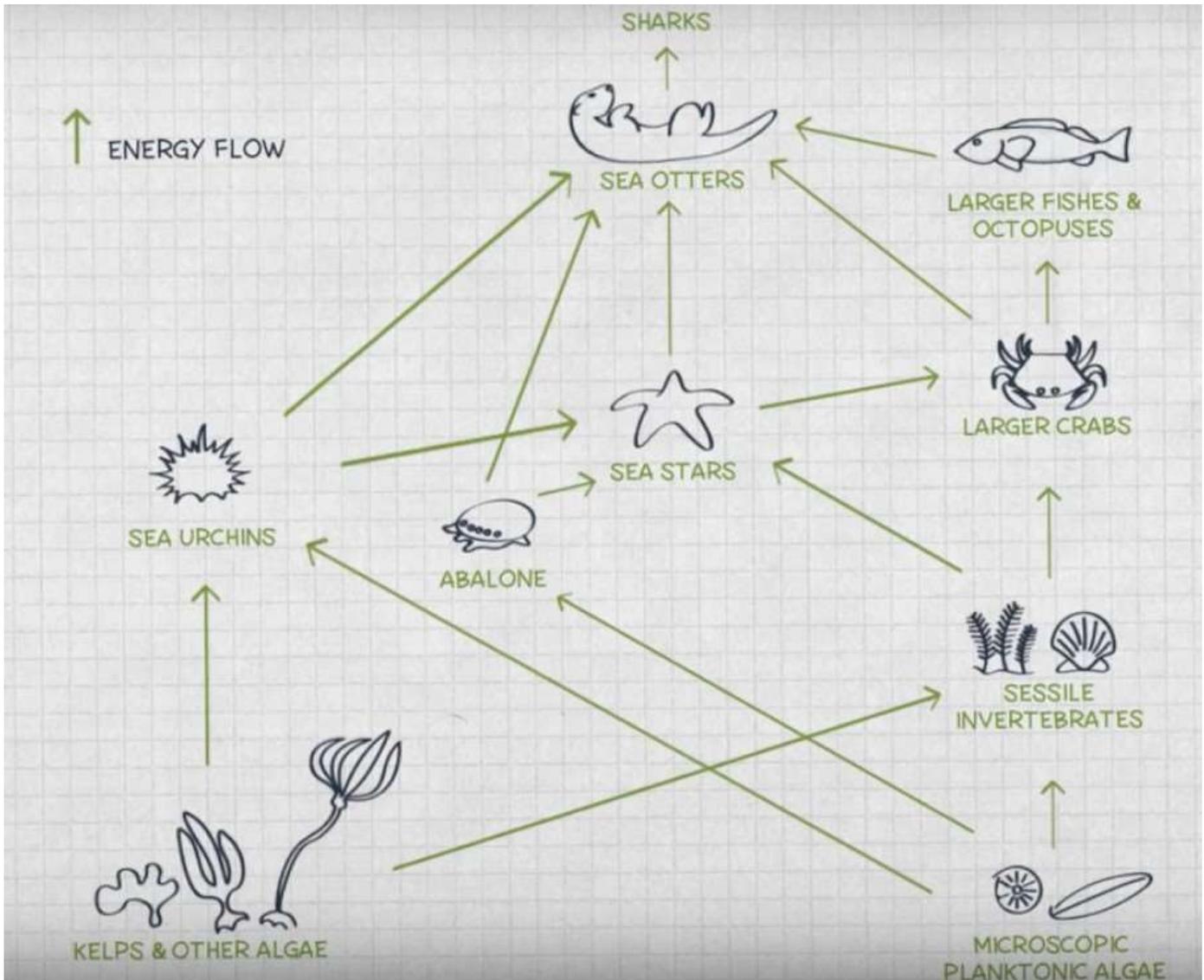
Step #4: Skills Building - Design a Food Web

Now it's time to program Sphero to explain a food web, using your knowledge of both food webs and algorithms.

On a large sheet of paper, draw the underwater food web described in the video. The image below is to help you get started, but not to copy.

NOTE: You will be programming Sphero to follow your food web. Think about how you are creating your arrows so that Sphero can easily follow along.

Take a picture of your food web and share it here at the end of this step.



Educator Tip:

As students are creating their food webs encourage them to use straight lines and measure the distance from one organism to the next.

Step #5: Skills Building - Create an Algorithm

Program Sphero to start at the consumer and move slowly along a chosen path to show the transfer of energy in the ecosystem. Be sure to repeatedly test your program along the way.

1. Which blocks did you use?
2. What went well?
3. What could you improve?
4. How have you used sequencing today?

Step #6: Challenge - Announce Each Organism

Can you program Sphero to announce each organism as it arrives on the food web?

Once your programmed path is complete, go back and add some lights and sounds. Select a different Main LED color at each stop. Also, name each organism Sphero stops at. *Which block can you use to*