The Shark Feed

LESSON 3

Activity 1: Link the Link
Food chains

A food chain shows how energy moves from the sun through plants and animals in an ecosystem. Organisms in a food chain have different roles based on how they obtain energy.

Fill in the missing words below and be prepared to explain your answers.

Energy in the sea comes from _____. Plants that turn the sun's energy into food are called _____. Animals that get their energy by eating plants or other animals are called _____. _____ consumers eat plants, while _____ consumers eat other animals. Animals that hunt and eat other animals are called _____, with the one at the top of the food chain called the _____ predator. Sharks are usually, but not always, apex predators.

Predator | Producer | Consumer | Secondary | Primary | Apex | The Sun

We can also represent a food chain using pictures. Use the terms from above to label each organism. Then explain how energy moves through this food chain.

Sun

Plankton

Shrimp

Mackerel

Mako

_____

_____

_____

_____

The Shark Feed - Catch of the Day Investigation

LESSON 3

Your teacher will provide the materials & instructions for this investigation.

Your challenge

Design a fair test to measure how much food (plastic beads) a straining feeder (the net) can collect. Then design a fair test to compare how much food a picking feeder (the tweezers) can collect.

Students must:

- identify the independent variable (tool used)
- identify the dependent variable (amount of food collected)
- keep controlled variables the same (e.g. time, water depth, starting position)

Students should:

- conduct multiple trials
- record results clearly
- calculate an average
- present results in a table or graph

Students must explain:

- how their test is fair
- which method is more effective
- how this represents real feeding strategies in marine animals

The Question is...

Which feeding method is more effective for collecting small pieces of food — straining or picking?

Do 3 “feeds” for each feeding style and record the amount collected each time. Calculate the average (mean) amount of “energy” collected.

	Feed 1	Feed 2	Feed 3	Average (mean)
Straining				
Picking				

Do 3 “feeds” for each feeding style – work out average “energy” per feed.

Based on your results, which feeding method is more effective for collecting small pieces of food?
Explain your answer using your data.

_____

_____

_____

The Shark Feed - Catch of the Day Investigation

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When a primary consumer feeds, it obtains energy that producers have converted from the Sun's energy.
This energy is used for life processes such as movement, growth and reproduction, and some energy is stored.

What do you use energy for? Think of three examples.

1. _____
2. _____
3. _____

How do living things store energy?

_____

Stored energy is passed to secondary consumers when they eat primary consumers.
This is how energy moves through a food chain and into a food web.
Not all energy is transferred — some is used by each organism.
Larger animals require more energy to survive and grow, so they need to consume more food.

In this activity:

- the straining feeder represents the primary consumer
- the picking feeder represents the secondary consumer

Use the results from your experiment to complete the table.

We will assume that:

- each primary consumer eaten by a secondary consumer equals 50 units of stored energy
- each secondary consumer eaten by a predator equals 500 units of stored energy

The Shark Feed - Catch of the Day Investigation

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Use your results to fill in the table below:

Sun | Producer | Primary Consumer | Secondary Consumer | Predator

Energy is transferred through the food chain, but some energy is lost at each level. This means predators must eat many organisms to gain enough energy.

We will assume that energy increases at each level of the food chain:

- Primary consumer = 1 bead of energy
- Secondary consumer = 50 beads of energy
- Predator = 500 beads of energy

	Primary Consumer (Filter)	Secondary Consumer (Picker)	Predator
A: Energy in each Food Item (bead)	1	50	500
B: Number of food items collected per feed (from your experiment)			4
C: Energy per feed (A x B)			2000
D: Energy for Activity (90%) C x 90%			1800
E: Energy Stored (10%) C x 10%			200

Bonus Questions

Our table shows that a predator needs to eat 4 secondary consumers to gain 2000 energy units. How many primary consumers would need to be eaten to provide the same amount of energy?

_____

_____

Would this be easier or harder? Explain your reasoning.

_____

_____

A basking shark is a filter feeder. How does it obtain enough energy to survive?

_____

_____

Where in the ocean does acid affect calcium structures? (Clue: Nemo's home)

_____

_____

The Shark's Toothpaste - Tooth Structure Investigation

LESSON 2

Structure - Human Tooth	Colour in diagram	Function (Stage 3 level)
	Dotted outline (top)	
	Outer yellow layer	
	Yellow layer under enamel	
	Pink centre	
	Red area around tooth	
	Brown layer on root	

Structure - Shark Tooth	Colour in diagram	Function (Stage 3 level)
	Smooth pale yellow outer edge	
	Pale yellow inner layer (cracked pattern)	
	Red centre	

Structure - Nerves	Visual cue in diagram	Function (Stage 3 level)
	Coloured branching lines at the top	
	Long, thin central strand	
	Rounded tip at the bottom	

The Shark's Toothpaste - Cavity Wars

Cavity Wars – The Battle for Healthy Teeth

Plaque bacteria constantly form on the surface of your teeth. These bacteria feed on sugars from food and produce acid as a waste product. This acid can damage tooth enamel, leading to tooth decay over time.
Your teeth need to protect themselves from this process so they can stay strong and healthy. If plaque bacteria could "give instructions", what actions would increase tooth decay? Write five instructions the plaque "commander" might give to damage teeth.

1.

2.

3.

4.

5.

Bonus Questions

Why do sharks not need toothpaste?

_____

_____

Which chemical in toothpaste helps strengthen enamel?

_____

_____

Name a food that contains calcium.

_____

_____

Where in the sea might acid damage calcium-based structures? (Clue: Nemo's home)

_____

_____