

## Food Webs

### Grade-Level Expectations

The exercises in these instructional tasks address content related to the following grade-level expectations:

- LS-M-C2 Analyze food webs to determine energy transfer among organisms (GLE 24)
- LS-M-C4 Predict the impact changes in a species' population have on an ecosystem (GLE 29)

### Contents

- These instructional tasks contain a set of document- or resource-based exercises about *food webs*.
- Teachers may choose to use or modify the tasks as part of an instructional lesson or as a formative or summative assessment.
- The printable student version excludes teacher directions.

	Objective(s)
<a href="#">Scaffolding Exercise 1</a>	<ul style="list-style-type: none"> <li>• Investigate and classify organisms belonging in a food web</li> </ul>
<a href="#">Scaffolding Exercise 2</a>	<ul style="list-style-type: none"> <li>• Create a food web based on classification of organisms</li> <li>• Illustrate and describe the transfer of energy within the web</li> </ul>
<a href="#">Scaffolding Exercise 3</a>	<ul style="list-style-type: none"> <li>• Predict and explain the effects on a food web when a loss or gain of an organism occurs</li> </ul>
<a href="#">Culminating Exercise</a>	<ul style="list-style-type: none"> <li>• Predict the probable effects on a food web based on given scenarios</li> </ul>
<a href="#">Scoring Rubric</a>	
<a href="#">Scoring Notes</a>	
<a href="#">Printable Student Version</a>	

# Scaffolding Exercise 1

**Teacher Directions:** Have students work in groups of three to investigate and classify the following organisms.

Organisms: algae, reeds, mosquito, dragonfly, heron, fish, diving beetle, lizard, crawfish, pelican, duck, snail, water ribbons, bulrushes, mosquito larvae, dragonfly larvae

Fill in the following table.

<b>Trophic Level</b>	<b>General Definition</b>	<b>Example Organisms</b>
Producer		
Primary Consumer		
Secondary Consumer		
Tertiary Consumer		
Quaternary Consumer		

## Scaffolding Exercise 2

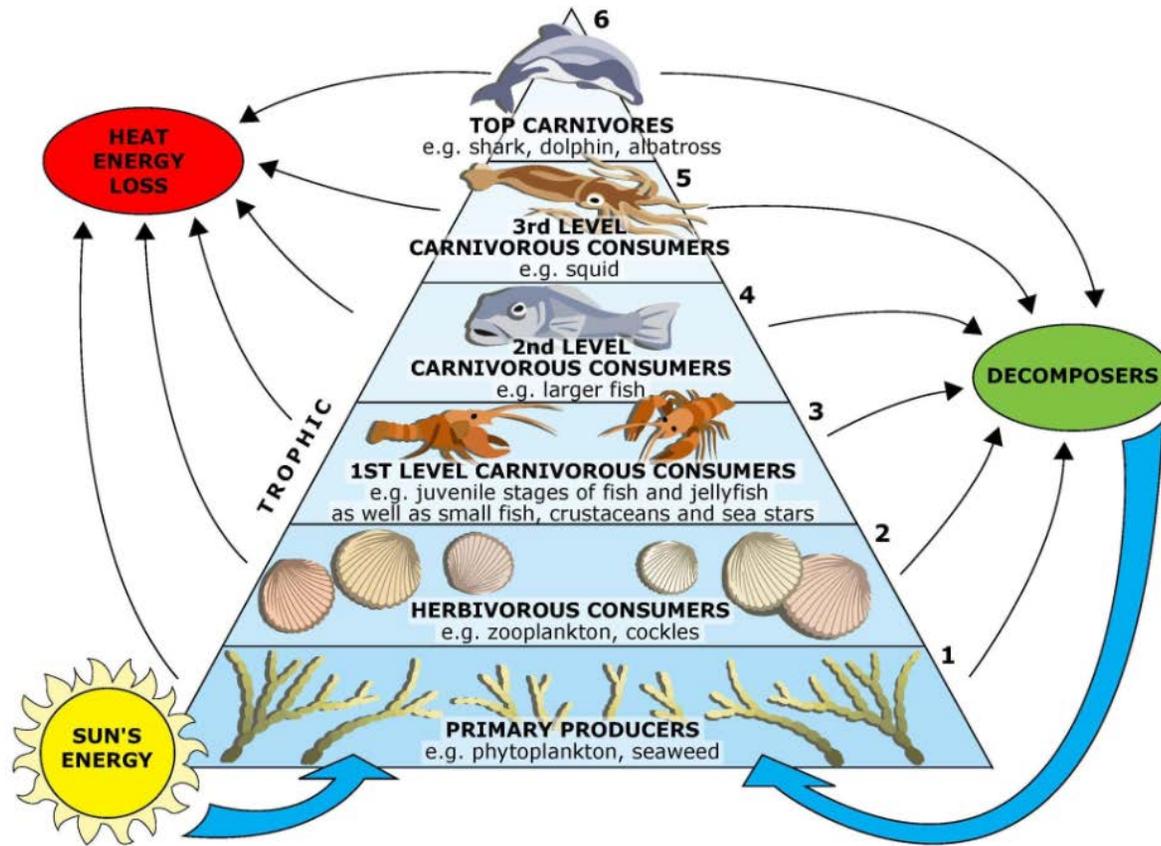
**Teacher Directions:**

Have students work with their group to create a food web based on the organisms classified in Exercise 1. Have students illustrate the food web so that the energy transfer is evident and write an explanation of the energy transfer to support their illustration.

## Scaffolding Exercise 3

**Teacher Directions:** Have students respond to the following prompt.

With your team, write an editorial predicting what kind of impact would be made on the food web from Scaffolding Exercise 2 with either an addition or deletion of a particular organism (the importance of the organism in the food web should also be included). The editorial should defend the prediction with evidence from the transfer of energy in the food web.



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A. For each of the following scenarios, predict the probable effects on the food web above.

1. The ocean becomes more acidic, therefore shelled animals will no longer be able to make shells.
2. The land that borders the water is used for farming and there is an increase in agricultural runoff. This increases the risk of harmful phytoplankton blooms.
3. A fishing company increases the annual catch of large fish.

B. Explain why some food webs are more likely to be impacted by change than others.

## Rubric

**Key Elements:**

- A. Response correctly predicts the effect on the food web in Scenario 1.
- B. Response correctly predicts the effect on the food web in Scenario 2.
- C. Response correctly predicts the effect on the food web in Scenario 3.
- D. Response correctly explains why some food webs are more likely to be impacted by change than others.

**4 Points**

Response includes all four key elements.  
Response contains no scientific errors.

**3 Points**

Response includes three of the four key elements.  
Response may include scientific errors.

**2 Points**

Response includes two of the four key elements.  
Response may include scientific errors.

**1 Point**

Response includes one of the four key elements.  
Response may include scientific errors.

A well-developed response should demonstrate a correct and thorough understanding of food webs, energy within the web, and factors that can impact the web. The response should be clear, include specific details, show a higher level of reasoning skills where appropriate, and address the key elements of the task.

## Scoring Notes

*Student responses will not be an exact imitation of the responses below. These are given only as examples.*

### Part A:

1. Shelled animals generally have a calcium carbonate shell. Water that is highly acidic may cause those organisms to lose the ability to grow a shell or they may grow a shell very slowly. This can lead to a loss of the shelled organisms which will affect the number of juvenile and small fish.
2. Agricultural run-off generally includes remnants of fertilizer used in farming. The fertilizer can trigger a large growth of phytoplankton which can deplete oxygen levels. This depletion can result in the death of several organisms that are dependent upon oxygen for survival.
3. Overfishing (or increasing the annual amount of fish caught) can lead to an increase in the organisms that large fish prey upon. A decrease in the top levels of carnivores could occur as well.

### Part B:

Food webs that contain more organisms are generally not as vulnerable to a change in the population as those that have just a few organisms.

**Printable**

**Student Version**

Working in groups, investigate and classify the following organisms.

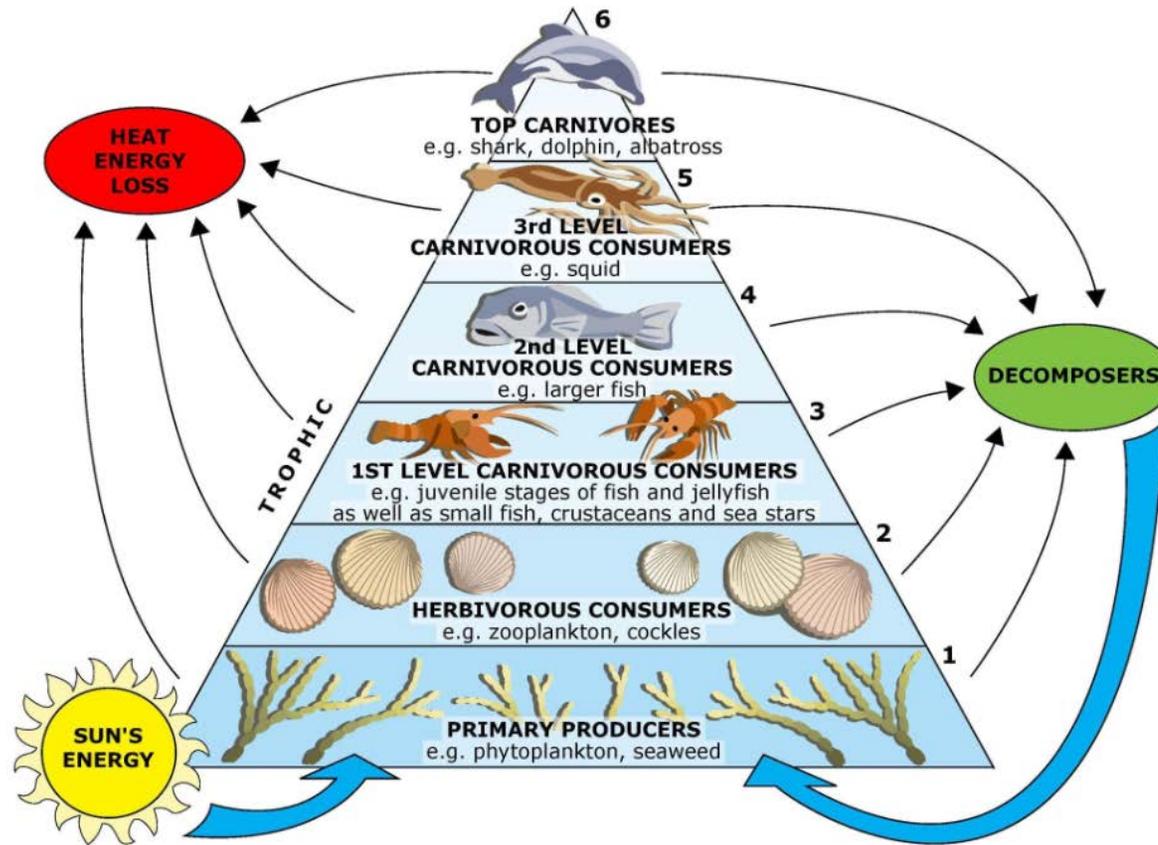
Organisms: algae, reeds, mosquito, dragonfly, heron, fish, diving beetle, lizard, crawfish, pelican, duck, snail, water ribbons, bulrushes, mosquito larvae, dragonfly larvae

Fill in the following table.

<b>Trophic Level</b>	<b>General Definition</b>	<b>Example Organisms</b>
Producer		
Primary Consumer		
Secondary Consumer		
Tertiary Consumer		
Quaternary Consumer		

Working with your group, create a food web based on the organisms classified in Exercise 1. Illustrate the food web so that the energy transfer is evident. Write an explanation of the energy transfer to support your illustration.

With your team, write an editorial predicting what kind of impact would be made on the food web from Scaffolding Exercise 2 with either an addition or deletion of a particular organism (the importance of the organism in the food web should also be included). The editorial should defend the prediction with evidence from the transfer of energy in the food web.



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A. Using the following scenarios, predict the probable effects on the food web above.

1. The ocean becomes more acidic, therefore shelled animals will no longer be able to make shells.
2. The land that borders the water is used for farming and there is an increase in agriculture runoff. This increases the risk of harmful phytoplankton blooms.
3. A fishing company increases the annual catch of large fish.

B. Explain why some food webs are more likely to be impacted by change than others.