

# Student Workbook

## California Education and the Environment Initiative

# 6

Science Standard  
6.5.c.



# Energy: Pass It On!

## **California Education and the Environment Initiative**

Approved by the California State Board of Education, 2010

### **The Education and the Environment Initiative Curriculum is a cooperative endeavor of the following entities:**

California Environmental Protection Agency  
California Natural Resources Agency  
California State Board of Education  
California Department of Education  
Department of Resources Recycling and Recovery (CalRecycle)

### **Key Partners:**

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### **Office of Education and the Environment**

1001 I Street • Sacramento, California 95814 • (916) 341-6769

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## Populations

### Lesson 1

Name: \_\_\_\_\_

**Instructions:** Complete the following tasks in the spaces provided.

1. List the three parts of the scientific definition of the word “population.” (3 points)

a. \_\_\_\_\_

b. \_\_\_\_\_

c. \_\_\_\_\_

2. Describe how the wolverine population in North America has changed during the past 200 years. (2 points)

\_\_\_\_\_

\_\_\_\_\_

3. Read the following prompts and complete the chart below about how other organisms affect the wolverine’s population. (1 point per cell)

**Left column:** List three populations of organisms that might affect wolverines.

**Middle column:** For each of these, imagine that their populations increase. How would such a change affect wolverines? Write your prediction in the middle column.

**Right column:** Explain why you think this would happen.

Populations of other organisms that affect wolverines	If the population in the left column increases, what might happen to the population of wolverines?	Why?

Name: \_\_\_\_\_

**Instructions:** For each reading, complete the name of the natural region the explorer studied. Next, identify examples of organisms that live in each region. Categorize each organism based on its role: producer, consumer (herbivore, carnivore, omnivore, scavenger), or decomposer. (1 point per cell)

Natural Region:		High Desert	North Coastal Forests (Redwoods)	Oak Woodland
Role in the Ecosystem		Examples of Populations of Organisms		
Producer				
Consumers	Herbivores			
	Carnivores			
	Omnivores			
	Scavengers			
Decomposers				

Name: \_\_\_\_\_

**Instructions:** Answer the following questions in the spaces provided. (2 points each)

1. What would happen to consumers if there were no producers?

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2. What would happen if there were no decomposers?

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3. Why are people considered to be consumers?

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# Energy Pyramids

## Lesson 3

Name: \_\_\_\_\_

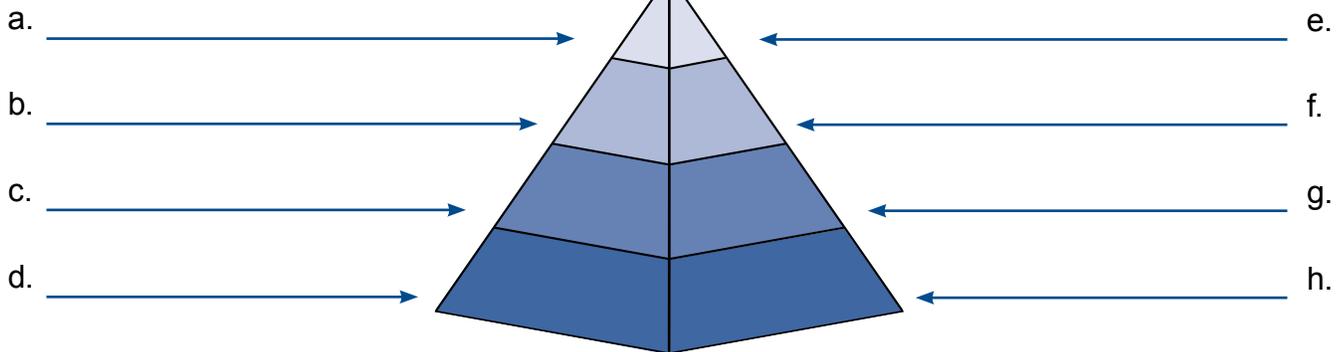
1. Label the trophic levels of the energy pyramid below. Use the following terms in your labels in the left column. Some of the lines will need more than one term. (6 points)

primary consumer producer	secondary consumer herbivore	tertiary consumer carnivore
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In the right column, give an example of an organism at each trophic level. (4 points)

### Trophic Levels / Types of Organisms

### Examples of Organisms



**Instructions:** Answer the following questions in the spaces provided. (4 points each)

2. A certain amount of grass gets 10,000 kcal of energy from the Sun. How much energy will be available to the next trophic level? Explain how you got your answer.

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3. Imagine you want to get 1 kcal of energy from a cow. How much energy would the cow need to get from plants? Why?

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4. If you want to feed more people using the same amount of farm land, should you provide foods from lower or higher portions of the energy pyramid? Why?

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## Human Practices and the Wolverine Food Web

Lesson 4 | page 1 of 2

Name: \_\_\_\_\_

**Instructions:** In your group, take turns presenting the **Human Practices Cards** to the group and leading a discussion. Ask, “How would this practice change the wolverine food web? Why?” After discussing each card, record your answers in the chart below. (2 points each)

Human practice	Prediction: How could this practice change the food web in the wolverine’s ecosystem? Explain your reasons.
Hunting mountain lions	<hr/> <hr/> <hr/> <hr/>
Fire suppression	<hr/> <hr/> <hr/> <hr/>
Building dams	<hr/> <hr/> <hr/> <hr/>
Livestock grazing	<hr/> <hr/> <hr/> <hr/>

# Human Practices and the Wolverine Food Web

Lesson 4 | page 2 of 2

Name: \_\_\_\_\_

Human practice	Prediction: How could this practice change the food web in the wolverine's ecosystem? Explain your reasons.
Trapping wolverines	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
Mining and development	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
Burning fossil fuels	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
Recreation	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/>

Name: \_\_\_\_\_

**Part 1: Timber Harvesting**

**Instructions:** Read **Timber Harvesting** (Student Edition, pages 11–12) and use the information to complete the chart below and on the next page.

Byproduct or change to natural system caused by human practice	Is this a byproduct (B) or a change (C)?	Effects on the natural system
<hr/> <hr/> <hr/>	<hr/>	<hr/> <hr/> <hr/> <hr/> <hr/>
<hr/> <hr/> <hr/>	<hr/>	<hr/> <hr/> <hr/> <hr/> <hr/>
<hr/> <hr/> <hr/>	<hr/>	<hr/> <hr/> <hr/> <hr/> <hr/>
<hr/> <hr/> <hr/>	<hr/>	<hr/> <hr/> <hr/> <hr/> <hr/>

Name: \_\_\_\_\_

**Part 1: Timber Harvesting** (continued)

Byproduct or change to natural system caused by human practice	Is this a byproduct (B) or a change (C)?	Effects on the natural system
<hr/> <hr/> <hr/>	<hr/>	<hr/> <hr/> <hr/> <hr/> <hr/>
<hr/> <hr/> <hr/>	<hr/>	<hr/> <hr/> <hr/> <hr/> <hr/>

**Part 2: Timber Harvesting**

**Instructions:** Answer the following question in the space provided.

What is your recommendation regarding your scenario? Why? (4 points)

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Name: \_\_\_\_\_

**Part 1: Other Human Practices** (1 point per cell; 18 total)

**Instructions:** Use information from one of the other readings: **Gravel Mining** (Student Edition, pages 13–14), **Mineral Mining** (Student Edition, pages 15–16), or **Rice Farming** (Student Edition, pages 17–18), to complete the chart below and on the next page.

Which human practice did you read about? \_\_\_\_\_

Byproduct or change to natural system caused by human practice	Is this a byproduct (B) or a change (C)?	Effects on the natural system
<hr/> <hr/> <hr/>	<hr/>	<hr/> <hr/> <hr/>
<hr/> <hr/> <hr/>	<hr/>	<hr/> <hr/> <hr/>
<hr/> <hr/> <hr/>	<hr/>	<hr/> <hr/> <hr/>
<hr/> <hr/> <hr/>	<hr/>	<hr/> <hr/> <hr/>

Name: \_\_\_\_\_

**Part 1: Other Human Practices** (continued)

Byproduct or change to natural system caused by human practice	Is this a byproduct (B) or a change (C)?	Effects on the natural system
<hr/> <hr/> <hr/>	<hr/>	<hr/> <hr/> <hr/>
<hr/> <hr/> <hr/>	<hr/>	<hr/> <hr/> <hr/>

**Part 2: Other Human Practices**

**Instructions:** Answer the following question in the space provided.

What is your recommendation regarding your scenario? Why? (4 points)

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