



## 8.1 Energy and Life

### Lesson Objectives

-  Describe the role of ATP in cellular activities.
-  Explain where plants get the energy they need to produce food.

### BUILD Vocabulary

A. The chart below shows key terms from the lesson with their definitions. Complete the chart by writing a strategy to help you remember the meaning of each term. One has been done for you.

Term	Definition	How I'm Going to Remember the Meaning
Adenosine triphosphate (ATP)	Compound that cells use to store and release energy	<b><u>A</u>TP makes a cell <u>able</u> to do work.</b>
Autotroph	A living thing that makes its own food	
Heterotroph	A living thing that gets its food by consuming other living things	
Photosynthesis	Process by which autotrophs use sunlight, water, and carbon dioxide to produce carbohydrates and oxygen	

B. As you work through this lesson, you may find these terms in the activities. When you need to write a key term or a definition, **highlight** the term or the definition.

### BUILD Connections

**ATP as a Charged Battery** An analogy takes two things that seem to be different and shows how they can be similar.



1. How is a partially charged battery like ADP? \_\_\_\_\_  
\_\_\_\_\_
2. Why do cells contain only a small amount of ATP?
  - A. ATP cannot store large amounts of energy for a long time.
  - B. ATP releases energy too quickly.
  - C. ATP cannot carry out active transport.
  - D. ATP has only two phosphate groups.

## BUILD Understanding

**Compare/Contrast Table** Use a compare/contrast table when you want to see the similarities and differences between two or more objects or processes. As you read, place an “X” in the box next to characteristics that are true of an autotroph or a heterotroph. One has been done for you.

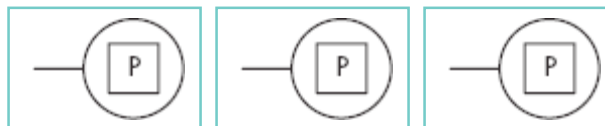
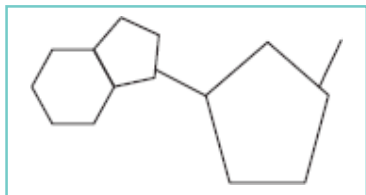
	Autotroph	Heterotroph
Directly uses sunlight for energy	X	
An oak tree is an example.		
A mushroom is an example.		
Makes its own food		
Consumes other living things to get energy		
Is capable of photosynthesis		

## Chemical Energy and ATP

**Chemical Energy** Living things use chemical fuels. One of the most important compounds that cells use to store and release energy is ATP.

*Follow the directions. Then answer the questions.*

- Trace the outlines of the adenosine molecule and the three phosphate groups.
- Cut out each phosphate group.
- Arrange the phosphate groups on the adenosine molecule to form a molecule of ATP.



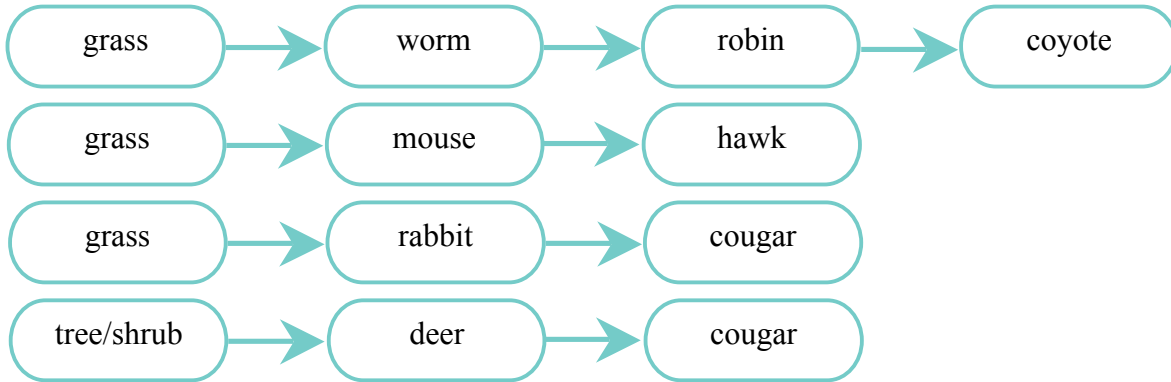
- When ATP is changed to ADP, it releases energy. Change your ATP molecule so that it forms ADP. What change did you make? \_\_\_\_\_
- ADP can be converted into ATP. Change your ADP molecule into ATP. What change did you make? \_\_\_\_\_
- Fill in the blanks with *two* or *three*. The primary difference in the structures of ATP and ADP is that ATP has \_\_\_\_\_ phosphate groups and ADP has \_\_\_\_\_ phosphate groups.

## Heterotrophs and Autotrophs

Look at the feeding relationships in each food chain. Each food chain contains an autotroph and one or more heterotrophs.

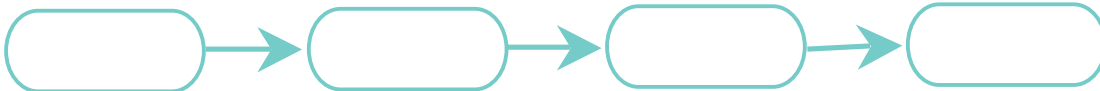
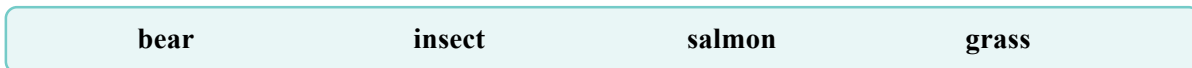
Follow the directions.

1. Color the autotrophs green.
2. Color the heterotrophs blue.



Answer the questions.

3. Which animal would be most affected if many trees died from disease?  
A. deer  
B. mouse  
C. worm  
D. None would be affected.
4. The organisms listed in the box belong to a food chain. Use the words in the box to fill in the food chain in the correct order.



5. Explain how top-level consumers such as hawks depend on sunlight for their food.

---

---

---

---

---

---

---