

**CBL BIOLOGY: LIFE SCIENCE OPTION**  
**BSCS Green Version 10th edition**  
**Biology An Ecological Approach**  
**Lesson Plan for Week 2, Day 1**



## Outcomes for Today

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Standards Focus: 1c 6de 10bde

### PREPARE

#### 1. Background knowledge necessary for today's reading.

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This lesson is an introduction to the most primitive forms of life which are grouped together under the term **prokaryotes**. These simple organisms are known to all, but much of it is through media exposure. Television commercials of talking germs and such visual oddities can distort student understanding of reality. Talk a little on how the simplification of science by the media can lead to false concepts and knowledge. Have students think of other examples. List the examples on the board.

#### 2. Vocabulary Word Wall.

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Introduce five important, useful words from today's reading.

**monera                  flagella                  nucleoid                  eubacteria                  archaeobacteria**

- Show, say, explain, expand, explode or buzz about the word briefly.
- Show, say and define the word quickly and add to the word wall.

### READ

#### 3. Review the vocabulary and concepts previously covered in this chapter.

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Start at the beginning and review the concepts and vocabulary covered so far.

- Mention the setting and main ideas.
- Point to the concept chart as you quickly review it.

In the previous lesson on classification, we have seen that the prokaryotes are at the bottom of the so-called evolutionary tree.

As we continue our studies, we will see that life will become more complex.

#### 4. Read directions for investigation/activity.

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**5. Read text. Ch11, Prokaryotes, Introduction, Sections 11.1, 11.2, and 11.3, pp.294-301**

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- Shared Reading RRP: Read, React, Predict every 2-3 pages  
 Tape  Partner  Choral  Silent  Round Robin Reading

Setting	Characters	Pages
everywhere on earth	prokaryotes	296
inside a prokaryotic cell		
hot acidic environments	cytoplasm, plasmid, nucleoid	296
areas with high salt concentrations		
anaerobic conditions	thermoacidophiles	299
	halophiles	300
	methanogens	300

### RESPOND

**6. Fix the facts. Clarify what's important.**

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Discuss the reading and add 3-5 events to the billboard.

- Discuss the text; clarify the most important facts, concepts, ideas and vocabulary.
- Decide on the 3-5 most important **concepts** and post these on the billboard.

Students might mention:

Most of the prokaryotes are one-celled organisms.

Prokaryotes come in many shapes including rods, spheres, curved rods, and spiral shapes.

Prokaryotes can digest and decompose just about anything including petroleum.

Prokaryotes were probably the first life on earth.

Prokaryotes can live practically anywhere on earth including in hot springs, extremely cold environments, and in deep cold oceans.

The most primitive of the bacteria are the archaebacteria.

Many animals have rumens in which live a complex soup of bacteria and enzymes which assist in digestion.

**7. Post information on the billboard. Add new information to ongoing class projects on the wall.**

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- New concept information can be added to the billboard.
- An answer can be added to a question from the KWL Chart.
- New information can be added to ongoing charts and investigations.

## EXPLORE

8. Explore today's investigation with inquiry activities.

---

9. Explore today's simulation with inquiry activities.

---

10. Collect data and post.

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### One possible activity:

#### The Great Spinach Scare

##### Introduction

Recently, the news media have posted a great deal of information on the presence of the prokaryote bacteria **E. Coli** in spinach. This vegetable was pulled off the supermarket shelves as scientists frantically searched for the source of the bacteria. So what was the final outcome? What did scientists find?

##### Activity

Have students spend a little time researching this. The internet is the obvious source, so assist students in researching the information. Here is an example of a reliable source:

<http://www.fda.gov/oc/opacom/hottopics/spinach.html>

In addition, you could use the Scilinks website referred to often in the text for up-to-date information:

<http://www.scilinks.org/>

The primary objective here is to separate good scientific information from blogs, opinions, and other non-scientific information.

##### Discussion

Students could post their findings on the board. This should be a small group activity.

Other possible activities for a class group or individual

- Bookmark Open Mind Portrait g6 Graphic Organizer
- g7 Main Idea Graphic Organizer c1-12 Cubing Postcard Prop
- Poster Ad Map Retelling Reader's Theatre Cartoon Rap

## Key Questions

What are some of the characteristics of prokaryotic cells?  
 Where are prokaryotes found here on earth?  
 What are decomposers and why are they important?  
 What can prokaryotes digest?  
 What are rumens and where are they found?  
 What do you think is meant by the term "bacterial flora" in humans?

Remember to ask literal structural idea craft author literature life  
evaluate and inference questions every day.

## Key Paragraph

Prokaryotes are extremely small. A spoonful of garden soil may contain 10 billion of them and the total number in your mouth is greater than the number of humans who have ever lived on earth. Prokaryotes cover the skin, line the nose and mouth, live in the gums and between the teeth, and inhabit the digestive tract of humans.

## EXTEND

**11.** Prompt every student to write a short product tied to today's reading.

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### You are Never Alone

Review with students the fact that they are host to a huge population of bacteria at various places on and in their bodies. Ask them to write a letter to the bacteria living with them on the "rules of how we can get along!"

**12.** Close with a short summary.

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Extend the reading to the students' lives or to the world

**CBL BIOLOGY: LIFE SCIENCE OPTION**  
**BSCS Green Version 10th edition**  
**Biology An Ecological Approach**  
**Lesson Plan for Week 2, Day 2**



## Outcomes for Today

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Standards Focus: 1c 6de 10bde

### PREPARE

#### 1. Background knowledge necessary for today's reading.

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We are once again introduced to another important natural cycle described in this lesson as the **nitrogen cycle**. The concept of a cycle deserves some attention here as so many life processes are cyclic. It might be helpful to review some simple and easily understood cycles such as the water cycle to help students begin to understand the complex issues involved in the nitrogen cycle which is introduced in this lesson.

#### 2. Vocabulary Word Wall.

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Introduce five important, useful words from today's reading.

**mycoplasmas      cyanobacteria      nodules      nitrifying      nitrogen cycle**

- Show, say, explain, expand, explode or buzz about the word briefly.
- Show, say and define the word quickly and add to the word wall.

### READ

#### 3. Review the vocabulary and concepts previously covered in this chapter.

---

Start at the beginning and review the concepts and vocabulary covered so far.

- Mention the setting and main ideas.
- Point to the concept chart as you quickly review it.

Prokaryotes are a kingdom of organisms.

Prokaryotes were probably the first living things on earth.

Another name for prokaryotes is Kingdom Monera

A type of bacteria that can produce food is known as cyanobacteria. They can do this because of photosynthesis.

Nitrogen is an essential part of the living world.

The nitrogen cycle helps to describe how the various forms of nitrogen flow through the environment.

4. Read directions for investigation/activity.

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5. Read text. Ch11, Prokaryotes, Text Sections 11.4, 11.5, and 11.6, pp. 301-305

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- Shared Reading RRP: Read, React, Predict every 2-3 pages  
 Tape  Partner  Choral  Silent  Round Robin Reading

Setting	Characters	Pages
soybean roots	nodules and <i>Rizobium</i>	304

## RESPOND

6. Fix the facts. Clarify what's important.

---

Discuss the reading and add 3-5 events to the billboard.

- Discuss the text; clarify the most important facts, concepts, ideas and vocabulary.
- Decide on the 3-5 most important **concepts** and post these on the billboard.

Students might mention:

The structure of the walls of bacteria is used to classify them.

Mycoplasmas are a type of bacteria capable of independent growth.

Some bacteria are a source of antibiotics used to fight disease.

The cyanobacteria are often responsible for the "algal" blooms in polluted lakes and rivers.

The nitrogen cycle explains how nitrogen moves through the environment in different forms.

Types of bacteria living in the roots of certain plants help return the nitrogen to the soil. This is good for food production.

7. Post information on the billboard. Add new information to ongoing class projects on the wall.

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- New concept information can be added to the billboard.
- An answer can be added to a question from the KWL Chart.
- New information can be added to ongoing charts and investigations.

## EXPLORE

8. Explore today's investigation with inquiry activities.

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9. Explore today's simulation with inquiry activities.

---

## 10. Collect data and post.

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### One possible activity:

#### The Nitrogen Cycle

See supplemental Investigation 11-1 attached to this lesson.

#### Discussion

This is a good site for more information:

<http://www.uen.org/themepark/cycles/chemical.shtml>

An additional resource is **Transparency 26** in the transparencies resource book.

Other possible activities for a class group or individual

- Bookmark Open Mind Portrait g6 Graphic Organizer  
g7 Main Idea Graphic Organizer c1-12 Cubing Postcard Prop  
Poster Ad Map Retelling Reader's Theatre Cartoon Rap

#### Key Questions

What was thought by scientists to be the primary source of oxygen in the earth's atmosphere? Why was this important?

Draw a simple diagram of the nitrogen cycle using local plants and animals.

How did early farmers make use of the nitrogen cycle even though they did not understand it?

How could you possibly tell if a plant is host to nitrogen-fixing bacteria?

Note: See additional questions on the student worksheet (Supplemental Student Investigation 11.1)

Remember to ask literal structural idea craft author literature life evaluate and inference questions every day.

#### Key Paragraph

Nitrogen is essential to all living things. In fact, it is found in two of the four types of biological molecules needed for life: proteins and nucleic acids. Just as carbon cycles through a community and back to the physical environment from which it came, nitrogen also cycles from the biotic to the abiotic parts of the ecosystem.

## EXTEND

**11.** Prompt every student to write a short product tied to today's reading.

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### **Nitrogen Cycle Rap Assignment for Students**

Direct them as follows:

With a partner of your choosing, construct a rap/poem that encompasses the entirety of the nitrogen cycle. This means you must explain every one of the five processes: ammonification, nitrification, assimilation, nitrogen fixation, and denitrification. You must include both the compound name and chemical makeup of all the chemicals important to the cycle. Include at least one line about the negative effects of a nitrogen cycle out of balance. Detail the role of bacteria (present in all but one step of the nitrogen cycle) and set your poem or rap in a specific place: a woodland, a marsh, a back yard, a drainage ditch, etc. You and your partner will be performing this rap/poem in front of the class, so practice!

**12.** Close with a short summary.

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Extend the reading to the students' lives or to the world.





## Supplemental Student Investigation 11.1 The Nitrogen Cycle or *Something's Rotten*

**Objective:** To understand the nitrogen cycle

### Introduction

Something is rotten in the state of California. It smells rotten, it looks rotten, and it stinks to high heaven. It's manure. While a clothespin on the nose may offer momentary relief from the offending odor, the fact is that this odious substance is something that we cannot do without. Animal waste is just one phase in the movement of one of the most important elements for life - nitrogen - through an ecosystem. Manure, in the right quantities, can be very beneficial and can support the balance of nature through the continual synthesis of important nitrogen-containing compounds. However, too much manure throws a wrench in the cycling of nitrogen throughout the ecosystem.

Nitrogen is a key component of many molecules that form the basic building blocks of life. Without nitrogen, we would be unable to make hormones, which stimulate activities such as growth and milk production. In the absence of nitrogen, organisms would be unable to produce DNA and RNA, the molecules responsible for the genetic code of life.

An overabundance of reactive nitrogen compounds, as represented by manure piles or lagoons, disrupts the nutrient balance. These chemicals leach into the groundwater or run off the ground surface into lakes and streams and cause accelerated anthropogenic **eutrophication** (a human-caused nutrient-rich state in a body of water).

The results of this accelerated **eutrophication** aren't pretty. Because of the additional nutrients in lakes and streams, huge amounts of algae begin to grow. Soon, they form mats of thick green slime, called **algal blooms**, on the surfaces of the affected lakes and streams. As these algal blooms swell, they block the sunlight, causing submerged plants in these lakes and streams to die.

Once these algae have consumed the excess nitrogen compounds in the water, they too die. The bacteria that help break down the dead algae use large quantities of dissolved oxygen in the water. The lake then becomes hypoxic, or oxygen-poor, and causes oxygen-requiring organisms, including aquatic insects and fish, to suffocate.

It is necessary for us to understand how nitrogen moves through the different compartments of the ecosystem in order to see the hazards of excess nitrogen production.

### Walking through a Nitrogen Cycle

Chemical elements on earth exist in a closed system. This means all chemical elements, including nitrogen, are neither created nor destroyed; rather, there is a finite amount of each.

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[www.scu.edu/character](http://www.scu.edu/character)

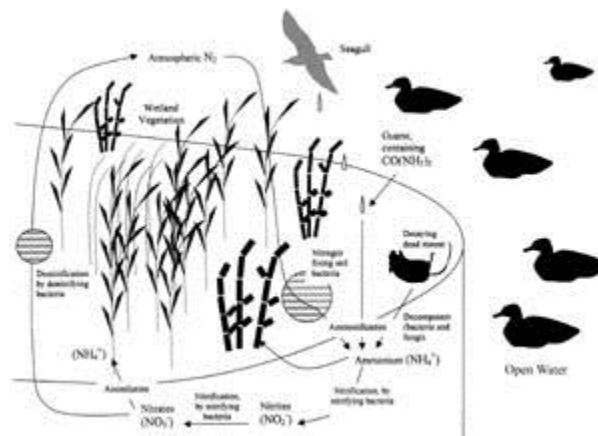
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Consider the way air is recycled on an airplane. The air is repeatedly taken from the passenger cabin through a filter and passed through a duct back into the passenger cabin. Similarly, chemical elements repeatedly cycle through compartments in an ecosystem. They are reorganized and recombined in different molecular forms such that the quantity of each element within the ecosystem remains the same.

Now, picture yourself standing near a marsh by the bay, with channels of water extending into marsh vegetation. A flock of gulls flies overhead and drops guano, little packets of nitrogen, over the marsh plants...

### **Ammonification: Conversion of Organic Nitrogen into Ammonia/Ammonium**

Much of the nitrogen contained in the guano is in the form of urea,  $\text{CO}(\text{NH}_2)_2$ . Urea,  $\text{CO}(\text{NH}_2)_2$ , quickly reacts with other compounds and ions in the atmosphere to form ammonium ions,  $\text{NH}_4^+$ , and ammonia,  $\text{NH}_3$ . Once the poop hits the ground, bacteria and fungi continue to break it (as well as other dead organisms) down into  $\text{NH}_4^+$  and  $\text{NH}_3$  through the process of ammonification. Plants can readily metabolize ammonium ions,  $\text{NH}_4^+$ , to build amino acids and proteins, so these ions are in high demand and quickly depleted in the soil.



### **Nitrification: Conversion of $\text{NH}_3$ or $\text{NH}_4^+$ into $\text{NO}_3^-$**

Soil bacteria combine oxygen with these ammonium ions,  $\text{NH}_4^+$ , to form nitrite,  $\text{NO}_2^-$ . Another group of nitrifying bacteria converts nitrite,  $\text{NO}_2^-$ , into nitrate,  $\text{NO}_3^-$ . Negatively charged nitrates can't bind to clay particles, so they are easily leached from the soil into the groundwater.

### **Assimilation: Plant Uptake and Use**

Plants may also uptake nitrate,  $\text{NO}_3^-$ , but must convert the nitrate back into ammonium,  $\text{NH}_4^+$ , in order to use the nitrogen. This is done through a

process called assimilation.

### **Nitrogen Fixation: Conversion of Nitrogen Gas Into Ammonia or Nitrate**

Nitrogen is made available for plants to metabolize through an additional parallel process: nitrogen fixation. Chemically inert nitrogen gas,  $\text{N}_2$ , comprises 78% of the air we breathe. Both free-living and symbiotic nitrogen-fixing bacteria pluck non-reactive nitrogen gas,  $\text{N}_2$ , from the atmosphere and combine it with hydrogen to form ammonia,  $\text{NH}_3$ . These bacteria use only the nitrogen that they require to live and then make this nitrogen available to plants when they die. Symbiotic nitrogen fixers live in nodules - the little white knobs found on the roots of legumes like clover and beans. The plants give the bacteria carbon in exchange for the excess nitrogen that the bacteria fix. In addition, nitrogen can be fixed by combustion, volcanic activity, lightning discharges, and commercial fertilizer production. The intense heat released by these processes breaks the strong bonds that bind the two nitrogen atoms together in  $\text{N}_2$ . The nitrogen then combines with oxygen to form nitrate,  $\text{NO}_3^-$ .

### **Denitrification: Reduction of Nitrate into Nitrogen Gas**

When the marsh ecosystem is oxygen deficient or the nitrates,  $\text{NO}_3^-$ , are in overabundance, denitrifying bacteria reduce the nitrates,  $\text{NO}_3^-$ , back into nitrogen gas,  $\text{N}_2$ .

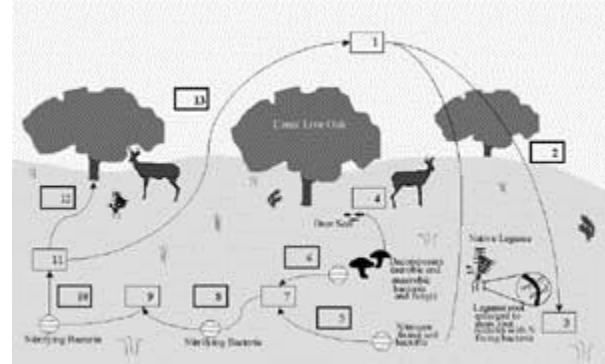
## Student Worksheet: Tracking the Path of Nitrogen

Students will identify the components and processes of the nitrogen cycle in two ecosystems.

### Student Directions

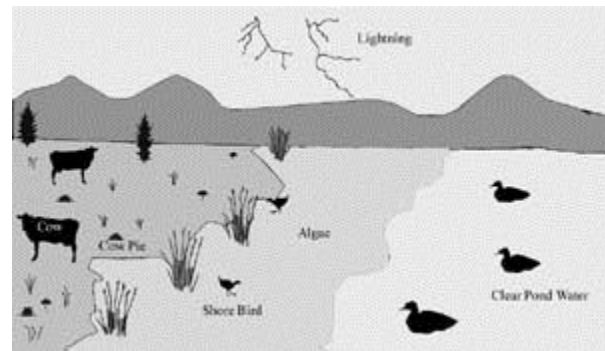
In pairs, study the California oak woodland diagram below and to the right. On a piece of paper, numbered 1 - 13. Identify the nitrogen compounds and nitrogen cycle processes represented by each of the numbered boxes at right. Each thin-lined box represents a nitrogen compound. Each thick-lined box represents a process, such as nitrification

Study the lake eco-system image below. This time there are no boxes to provide you with hints. Record your answers to the questions below.



### KEY

1.  $N_2$
2. Ammonification
3.  $NH_4^+$
4. Urea
5. Ammonification
6. Ammonification
7.  $NH_4^+$
8. Nitrification
9.  $NO_2^-$
10. Nitrification
11.  $NO_3^-$
12. Assimilation
13. Denitrification
14. Where are the sources of nitrogen gas?
15. What is facilitating nitrogen fixation?
16. What organisms in the image produce urea?
17. What organisms are responsible for converting the ammonium into nitrite and nitrate?
18. Where is assimilation occurring in this picture?
19. What processes are at work below ground in the nitrogen cycle?
20. What organisms are responsible for these processes?
21. What visual cues tell you that the nitrogen cycle is out of balance?
22. How might the image look different if it were in balance?
23. What suggestions would you make for lowering the nitrogen inputs?



**CBL BIOLOGY: LIFE SCIENCE OPTION**  
**BSCS Green Version 10th edition**  
**Biology An Ecological Approach**  
**Lesson Plan for Week 2, Day 3**



## Outcomes for Today

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Standards Focus: 1c 6de 10bde

### PREPARE

#### 1. Background knowledge necessary for today's reading.

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Bacteria and disease are the focus here. Have students give their simple definition of disease. Ask them why, for example, so many people in past wars (such as the Civil War) died after being wounded whereas the victims of the Iraq war do not die in as great numbers. What has happened since the mid 1800's that has to do with disease?

#### 2. Vocabulary Word Wall.

---

Introduce five important, useful words from today's reading.

**pathogen          immunity          host          vaccine   antibodies**

- Show, say, explain, expand, explode or buzz about the word briefly.
- Show, say and define the word quickly and add to the word wall.

### READ

#### 3. Review the vocabulary and concepts previously covered in this chapter.

---

Start at the beginning and review the concepts and vocabulary covered so far.

- Mention the setting and main ideas.
- Point to the concept chart as you quickly review it.

Prokaryotes are very small and very ancient forms of life. They exist practically everywhere on earth.

Prokaryotes are very simple; however, they carry out complex chemical reactions.

Many forms of bacteria are essential for the important life processes on earth such as creating oxygen and making nitrogen available for plants.

The nitrogen cycle is a way of understanding how nitrogen in its various forms flows through the earth.

#### 4. Read directions for investigation/activity.

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#### 5. Read text. Ch11, Prokaryotes, Text Sections 11.6, 11.7, 11.8, & Investigation 11. 110.7. pp.306-311 and 317-319

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- Shared Reading RRP: Read, React, Predict every 2-3 pages  
 Tape  Partner  Choral  Silent  Round Robin Reading

Setting	Characters	Pages
England in the 1700's	Edward Jenner	306

### RESPOND

#### 6. Fix the facts. Clarify what's important.

---

Discuss the reading and add 3-5 events to the billboard.

- Discuss the text; clarify the most important facts, concepts, ideas and vocabulary.
- Decide on the 3-5 most important **concepts** and post these on the billboard.

Students might mention:

A disease is a condition that affects an organism's ability to perform life's functions.

A host is the organism that is affected by the disease.

When an organism can fight off a disease it is said to have resistance.

Resistance makes the host immune to the disease by producing antibodies.

Once we catch and suffer through some disease, we build up resistance enough to never catch the same disease again.

Many diseases can be prevented by vaccines.

Many forms of bacteria are the cause of diseases ranging from plant diseases to tooth decay.

Viruses also are the cause of diseases, but they need a host to reproduce.

#### 7. Post information on the billboard. Add new information to ongoing class projects on the wall.

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- New concept information can be added to the billboard.
- An answer can be added to a question from the KWL Chart.
- New information can be added to ongoing charts and investigations.

### EXPLORE

#### 8. Explore today's investigation with inquiry activities.

---

#### 9. Explore today's simulation with inquiry activities.

---

## 10. Collect data and post.

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### One possible activity:

#### Distribution of Microorganisms, Investigation 11.1 in the text

This is a relatively simple procedure designed to help understand the levels of bacteria found in common locations.

#### Procedure

Follow the directions in the text beginning on page 317.

### Another possible activity:

Go to this site for small group or class tutorial and review on bacteria:

[http://www.biology.arizona.edu/cell\\_bio/tutorials/pev/main.html](http://www.biology.arizona.edu/cell_bio/tutorials/pev/main.html)

Other possible activities for a  class  group or  individual

- Bookmark  Open Mind Portrait  g6 Graphic Organizer  
 g7 Main Idea Graphic Organizer  c1-12 Cubing  Postcard  Prop  
 Poster  Ad  Map  Retelling  Reader's Theatre  Cartoon  Rap

### Key Questions

What is a disease?

Why is it that a person can have chicken pox only once?

How does a vaccine work?

List some of the causes of diseases.

Name some diseases caused by bacteria.

Name some diseases caused by viruses.

Remember to ask  literal  structural  idea  craft  author  literature  life  
 evaluate and  inference questions every day.

### Key Paragraph

Disease may result from a variety of causes. The pathogens involved in infectious diseases may be viruses, eubacteria, or other organisms. For example, athlete's foot, ringworm, potato blight, and corn smut are caused by fungi. Protists cause malaria, African sleeping sickness, and amoebic dysentery. Many worms and insects cause diseases of plants and animals, and are important vectors, or carriers, of disease. Other diseases such as scurvy are the result of diet deficiencies; still others are a result of advancing age; and some, such as asthma, are brought on by reactions to substances or pollutants in the environment. Finally, some disorders, such as cystic fibrosis or Huntington's disease, are hereditary.

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**EXTEND**

**11.** Prompt every student to write a short product tied to today's reading.

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**One Wish**

Prompt students with this quick-write question:

If you had the power to eliminate one disease in the world, what would it be and why?

**12.** Close with a short summary.

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Extend the reading to the students' lives or to the world.



**CBL BIOLOGY: LIFE SCIENCE OPTION**  
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**Biology An Ecological Approach**  
**Lesson Plan for Week 2, Day 4**



## Outcomes for Today

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Standards Focus: 1c 6de 10bde

### PREPARE

#### 1. Background knowledge necessary for today's reading.

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STDs (sexually transmitted diseases) are the focus of this lesson. As a general rule, many students are well-informed about STDs but misinformation still abounds. In this lesson, you should focus on the biology and chemistry of STDs. After all, this is science.

#### 2. Vocabulary Word Wall.

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Introduce six important, useful words from today's reading.

**STDs      gonorrhea      chancre      syphilis      chlamydia      AIDS**

- Show, say, explain, expand, explode or buzz about the word briefly.
- Show, say and define the word quickly and add to the word wall.

### READ

#### 3. Review the vocabulary and concepts previously covered in this chapter.

---

Start at the beginning and review the concepts and vocabulary covered so far.

- Mention the setting and main ideas.
- Point to the concept chart as you quickly review it.

The most primitive, diverse, and ancient kingdom of living things is the Prokaryotae.

Members of this kingdom inhabit a wide variety of often extreme habitats on earth.

There are many prokaryote pathogens.

Many diseases are the result of the Kingdom Prokaryotae.

Disease organisms in this kingdom include various bacteria and viruses.

Understanding the biology of the prokaryotae is important in understanding the disease process and how diseases can be controlled.



**4. Read directions for investigation/activity.**

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**5. Read text. Ch11, Prokaryotes, Text Sections 11.9, 11.10, and 11.11, pp. 312-316**

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- Shared Reading RRP: Read, React, Predict every 2-3 pages  
 Tape  Partner  Choral  Silent  Round Robin Reading

Setting	Characters	Pages
the STD infected human body	gonorrhea eubacteria, syphilis spirochete	312

### RESPOND

**6. Fix the facts. Clarify what's important.**

---

Discuss the reading and add 3-5 events to the billboard.

- Discuss the text; clarify the most important facts, concepts, ideas and vocabulary.
- Decide on the 3-5 most important **concepts** and post these on the billboard.

Students might mention:

There are a number of sexually transmitted diseases (STDs) which are the result of bacteria or viruses.

Gonorrhea has much more of an effect on the male.

The number of gonorrhea cases has been going up each year.

Syphilis is a much more serious disease than gonorrhea.

Chlamydia is the third group of the STDs. It is very common.

The AIDS virus was discovered in 1983.

HIV and AIDS are not the same thing, but stages in the development of the disease.

There has been some progress in combating AIDS, but there is no vaccine.

**7. Post information on the billboard. Add new information to ongoing class projects on the wall.**

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- New concept information can be added to the billboard.
- An answer can be added to a question from the KWL Chart.
- New information can be added to ongoing charts and investigations.

### EXPLORE

**8. Explore today's investigation with inquiry activities.**

---

**9. Explore today's simulation with inquiry activities.**

---

## 10. Collect data and post.

---

### Two possible activities:

#### 1. Understanding AIDS Graphically

A scientific understanding of the AIDS disease can be somewhat difficult to grasp. If you have access to a computer with internet access and projector, these sites can be very useful in assisting students towards an understanding:

<http://www.learner.org/channel/courses/biology/units/hiv/index.html>

This site has excellent graphics as an aid to understanding the AIDS life cycle:

<http://www.msichicago.org/exhibit/AIDS/AIDSlc1.html>

#### 2. The Face of AIDS

Have students create some sort of collage depicting the contrasting views and messages of American society regarding AIDS. Use magazine pictures and/or personal illustrations. For example, the sexualized messages of the media on one side and the face of a full blown AIDS patient on the other. Allow creativity. Students should be prepared to share their work with explanation.

Other possible activities for a  class  group or  individual

- Bookmark  Open Mind Portrait  g6 Graphic Organizer  
 g7 Main Idea Graphic Organizer  c1-12 Cubing  Postcard  Prop  
 Poster  Ad  Map  Retelling  Reader's Theatre  Cartoon  Rap

### Key Questions

Name the three most common STDs that are the result of bacteria.

Why is gonorrhea increasing in recent years?

What are the stages of syphilis? Describe each one.

What is the most common of the STDs and what are the symptoms?

What is an opportunistic infection?

Regarding an HIV infection, how long does it take for an infected individual to develop the full blown AIDS symptoms?

How is the AIDS virus introduced into the body? List the avenues.

Remember to ask  literal  structural  idea  craft  author  literature  life  
 evaluate and  inference questions every day.

**Key Paragraph**

A number of diseases are transmitted by sexual contact with infected persons. These diseases include gonorrhea, syphilis, chlamydia, herpes, and AIDS (*acquired immuno deficiency syndrome*). Gonorrhea, syphilis, and chlamydia are caused by eubacteria; herpes and AIDS are caused by viruses.

**EXTEND**

**11.** Prompt every student to write a short product tied to today's reading.

---

**Personalizing AIDS**

There are two possibilities for this short writing assignment.

**Option A**

If students have a relationship with someone with AIDS, have them write about this relationship.

**Option B**

Ask students to write honestly to this prompt:

Suppose a new student came into this class and was assigned to the seat next to you.

You later find out that this person has AIDS. How would you respond both internally (feelings) and externally (in your conversations, reactions, etc.) to this situation?

Include your reactions in a paragraph.

**12.** Close with a short summary.

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Extend the reading to the students' lives or to the world.

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**BSCS Green Version 10th edition**  
**Biology An Ecological Approach**  
**Lesson Plan for Week 2, Day 5**



## Outcomes for Today

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Standards Focus: 2d

### PREPARE

#### 1. Background knowledge necessary for today's reading.

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This is a new chapter and algae is what it is what it is all about in this lesson. Many students have heard of algae, but rest assured, it is not at the top of their list of prior knowledge subjects. Ask them where they think most of the world's oxygen comes from. You can probably find some sort of evidence of algae in the local environment. Try to procure a sample before beginning this lesson. It is everywhere and one sample is worth many words. Once students have a visual picture, they can begin to understand that algae (singular alga) is one of the most common organisms on earth.

#### 2. Vocabulary Word Wall.

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Introduce five important, useful words from today's reading.

**pigment          nonmotile          silica          zoospore          chloroplast**

- Show, say, explain, expand, explode or buzz about the word briefly.
- Show, say and define the word quickly and add to the word wall.

### READ

#### 3. Review the vocabulary and concepts previously covered in this chapter.

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Start at the beginning and review the concepts and vocabulary covered so far.

- Mention the setting and main ideas.
- Point to the concept chart as you quickly review it.

Autotrophic means that the organism can produce its own food.

Photosynthesis is the process of converting light energy into stored food carried out by green plants.

**4. Read directions for investigation/activity.**

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**5. Read text. Ch12, Text Introduction, Sections 12.1-12.4, pp.324-329**

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- Shared Reading RRP: Read, React, Predict every 2-3 pages  
 Tape  Partner  Choral  Silent  Round Robin Reading

Setting	Characters	Pages
almost anywhere it is wet warm seas	green algae red algae	326 328

## RESPOND

**6. Fix the facts. Clarify what's important.**

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Discuss the reading and add 3-5 events to the billboard.

- Discuss the text; clarify the most important facts, concepts, ideas and vocabulary.
- Decide on the 3-5 most important **concepts** and post these on the billboard.

Students might mention:

Algae grows almost anywhere there is moisture and water.  
 Green algae can reproduce both sexually and asexually.  
 Diatoms have a varied intricate pattern of shapes.  
 Diatoms provide much of our oxygen.  
 Filters made from diatoms are used for many purposes including filtering beer!  
 Protists are a large group of primitive organisms.  
 Algae is a food source as well as a source for such products as lipstick,  
 marshmallows, and ice cream.

**7. Post information on the billboard. Add new information to ongoing class projects on the wall.**

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- New concept information can be added to the billboard.
- An answer can be added to a question from the KWL Chart.
- New information can be added to ongoing charts and investigations.

## EXPLORE

**8. Explore today's investigation with inquiry activities.**

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**9. Explore today's simulation with inquiry activities.**

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## 10. Collect data and post.

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### One possible activity:

#### A Closer Look

Algae can be found almost anywhere. Any aquarium will develop a growth of algae if left long enough. If you are planning ahead, simply put a large jar of water in a window. Sooner or later, it will develop a growth of algae. Other easily located sources are any permanent watercourse, gardens, nursery flower pots, and any source of standing water.

#### Procedure

If you have access to even a simple microscope, demonstrate for students the method of a wet mount slide with some green algae.

#### Activity

Have students make illustrations of the various forms of algae they observe. Make sure they include some detail. Figure 12.1 on page 326 of the text is a good reference.

#### Discussion

Have students record their observations.

Other possible activities for a  class  group or  individual

Bookmark  Open Mind Portrait  g6 Graphic Organizer

g7 Main Idea Graphic Organizer  c1-12 Cubing  Postcard  Prop

Poster  Ad  Map  Retelling  Reader's Theatre  Cartoon  Rap

#### Key Questions

Why do scientists believe that green algae was the ancestor to all green plants on earth today?

What is diatomaceous earth and what is it used for?

What is the largest example of algae?

Why can red algae grow deeper in the ocean depths?

Name some products found in most homes that contain algae.

Remember to ask  literal  structural  idea  craft  author  literature  life  evaluate and  inference questions every day.

#### Key Paragraph

Protists and fungi are eukaryotes. They possess organized nuclei and membrane-enclosed organelles. Evidence suggests that some of these organelles originated from free-living prokaryotic ancestors.

## EXTEND

**11.** Prompt every student to write a short product tied to today's reading.

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### **My Place in the Universe**

Here is a little twist on perspective. Talk a little first about perspective, and then have students write a short paragraph from the perspective of a diatom. Have the diatom address a message to humans about the future of earth. Remember that diatoms are extremely numerous and many scientists consider them quite beautiful. See Figure 12.4 on page 327 of the text.

**12.** Close with a short summary.

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Extend the reading to the students' lives or to the world.