UNIT 7

MICROBIOLOGY
FIGHTING INFECTIOUS DISEASES

Unit Description

Content: This course is designed to familiarize the student with concepts in microbiology.

Skills: Purpose

- Recognizing a writer’s purpose
- Recognizing a speaker’s purpose
- Understanding thought groups
- Using intonation
- Understanding sentence stress (rhythm)
- Recognizing how thought groups, intonation, and stress express a speaker’s attitude
- Recognizing a writer’s secondary purpose
- Taking into account audience needs while preparing a presentation

Unit Requirements

- Lecture: “Conditions That Affect the Spread of Infectious Diseases”
- Integrated Speaking Task: Preparing and delivering an oral presentation about combating the spread of infectious diseases and antibiotic resistance
- Assignments: www.MyAcademicConnectionsLab.com
Contents

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   Integrated Speaking Task

GRAMMAR CHART: Modals: Expressing Degrees of Necessity

UNIT 7 ANSWER KEY
1 PREVIEW

Go to www.MyAcademicConnectionsLab.com for Vocabulary Check.

Previewing the Academic Content, page 136

Courses in microbiology focus on the study of life and organisms that are too small to be seen without the aid of a microscope. Students with an undergraduate degree in microbiology might pursue clinical or research careers as industrial, environmental, pharmaceutical, medical, cosmetic, or veterinary microbiologists; or as quality assurance technologists. In this unit, students will examine:

- conditions that affect the spread of infectious diseases
- resistance to antimicrobial drugs
- preserving the usefulness of antibiotics

Activating Background Knowledge

- Before students read and study about microbiology, you may want to spend some time exploring their perceptions about infectious diseases.
  - Has any of them had direct experience living in an area in which there was an epidemic? What was the disease and what measures were taken to contain the epidemic? Note that they will use some of this information to complete the chart on page 138.
  - How might a natural disaster, such as an earthquake, hurricane, or typhoon be the cause of a rapidly spreading infectious disease?
- Examine the Key Words on page 136. This vocabulary will be helpful for comprehension of the texts and lecture in this unit and useful for the Integrated Speaking Task.
- Before students begin Exercise 2, page 137, elicit the definition of collocates. Remind students that they learned about some specific collocations (words that are frequently used together) in Units 1 and 3. Point out that collocations are often content specific and that learning collocations is an excellent way to build vocabulary in specific content areas.

Go to www.MyAcademicConnectionsLab.com for Key Words and Key Words: Practice.
Previewing the Academic Skills Focus, page 139

Highlight the purpose of this section, stated on the left. This unit focuses on strategies for:

- recognizing a writer’s or speaker’s primary and secondary purposes
- using thought groups, stress, and intonation to express intended meaning
- taking into account audience needs while preparing a presentation

Review the academic skill focus: Recognizing a Writer’s Purpose. Remind students that they were introduced to primary purpose in Unit 2 when they learned about various patterns of organization and the relationship of each pattern to a writer’s purpose. In this unit, students will learn about integrating more than one purpose into a text or speech.

After students have completed Exercises 2 and 3, page 140, discuss their answers as a class.

- Exercise 2, 1: The primary purpose of Paragraph A is to inform. We know this because the paragraph contains facts and statistics.
- Exercise 2, 2: The writer does not repeat data from the table because that would be boring. The writer brings a new perspective to the data in the table and points out the main ideas that the reader should notice.
- Exercise 3: The primary purpose of Paragraph B is to persuade. The first sentence mentions areas of concern, which are elaborated in subsequent sentences. The last sentence expresses an opinion.

Go to www.MyAcademicConnectionsLab.com for Comprehension.

Go to www.MyAcademicConnectionsLab.com for Discussion Board.

2 BUILDING ACADEMIC LISTENING SKILLS

Go to www.MyAcademicConnectionsLab.com for Vocabulary Check.

Highlight the purpose of this section, stated on the left. Tell students that they will learn to recognize a speaker’s purpose and attitude.
Before You Listen, page 141

Students learn about another set of collocations related to the metaphor that compares fighting disease to fighting a war.

Examine the Key Words on page 141. This vocabulary will be helpful for comprehension of the lecture and useful for the Integrated Speaking Task. Point out to students that the Key Words here are another set of content-specific collocations.

Go to www.MyAcademicConnectionsLab.com for Key Words and Key Words: Practice.

Global Listening, page 142

Students listen to a lecture about conditions that affect the spread of infectious disease.

- After students have filled in the first column of the chart on page 142, point out that they will be using the chart as they listen to the lecture the first time. In the first listening, they should focus on the second column and not be concerned about the third.
- Before students listen to the lecture a second time, point out that they will now focus on the third column of the chart on page 142.
- Before students listen to the lecture a third time, have them complete the left-hand column of the chart on page 143.
- Also before they listen for the third time, review the pronunciation of these words in the box on page 144.
  - par-a-sites
  - schis-to-so-mi-a-sis
  - bu-bon-ic plague
- Tell students that as they listen to the lecture a third time, they will fill in the right-hand column of the chart on page 143 with their notes about the lecture.
Summary of the Lecture

“Conditions That Affect the Spread of Infectious Diseases,” page 142 (For the complete audioscript, see Academic Connections 4, pages 192–193.)

The outbreak of SARS in 2003 and the recent outbreak of swine flu are examples of infectious diseases on a global scale. The professor identifies the following conditions that encourage or discourage the spread of infectious diseases.

- **If we’re healthy, we can more easily resist disease**; if we’re not healthy, we are more likely to be susceptible.
- **Clean water supply and efficient water treatment are essential to disease prevention.** Water can contain parasites that cause schistosomiasis associated with bladder, liver, kidney, and intestinal damage. It is estimated that 200 million people may be infected with this disease and 200,000 die of it every year.
- **Food preparation affects health.** Gastroenteritis, a disease of the stomach and intestines, is caused by poorly prepared foods, reheated meat and fish, and dairy and bakery goods. This disease kills 5 to 8 million people annually and is a leading cause of death in children under five.
- **Living in large groups makes people more vulnerable to disease.** It takes about two weeks for antibodies to develop in the body of a child exposed to measles. This means that for the measles virus to live, it must find a new body every two weeks. This is an easy thing in schools and playgroups, where crowds of children regularly come in close contact.
- **Having more contact with waste products puts people at greater risk for infectious disease.** Many bacterial diseases and parasitic worms result from contact with human and animal waste, which must be minimized in order to reduce disease.
- **Large groups of people tend to behave in ways that attract agents of disease.** For example, cutting down trees to build farms or cities causes stagnant water, which is a breeding ground for mosquitoes that carry malaria. Rats and other rodents are also attracted to places inhabited by large groups of people.
- **Levels of travel can enhance the spread of disease.** Sometimes unknowingly infected people travel between countries, spreading a disease across borders, sometimes to populations that have not been previously exposed to the disease, and therefore, much more vulnerable to it. Examples:
  - The Black Death (bubonic plague), transmitted by rat fleas, began in China. It eventually reached Europe and by the end of the epidemic had killed 1/3 of Europeans; it is unknown how many Chinese died. These deaths changed the economics and culture of Asia and Europe forever.
  - The native people of the Americas and other colonized parts of the world contracted diseases from European explorers and colonists. Measles, smallpox, influenza, and whooping cough killed natives
throughout North and South America, the Pacific Islands, and Australia. Some populations were completely wiped out; whole cultures were destroyed.


**Focused Listening, page 144**

Students listen to the lecture again and learn about recognizing a speaker’s purpose. They also learn about how a speaker uses thought groups, intonation, and stress to express attitudes.

Review the academic skills focus: Recognizing a Speaker’s Purpose.

For the complete audioscript of the excerpts from the lecture, see *Academic Connections 4*, page 193.

Review the academic skills focus: Understanding Thought Groups, page 145.

Review the academic skills focus: Using Intonation, page 146.

Review the academic skills focus: Understanding Sentence Stress (Rhythm), page 147.

As students practice saying the various sentences in Exercises 3–5, pages 146–147, you may want to have them record themselves as they read.

Have students form small groups, listen to their recordings, and give each other feedback.

Review the academic skills focus: Recognizing How Thought Groups, Intonation, and Stress Express a Speaker’s Attitude, pages 147–148.

Go to www.MyAcademicConnectionsLab.com for Listening Activity 5.

Go to www.MyAcademicConnectionsLab.com for Checkpoint 1.
3 BUILDING ACADEMIC READING SKILLS

Go to www.MyAcademicConnectionsLab.com for Vocabulary Check.

Highlight the purpose of this section, stated on the left. Tell students that they will learn to recognize a writer’s secondary purpose.

Before You Read, page 150

Students work with partners to learn and practice using key terms in microbiology.

• Examine the Key Words on page 150. This vocabulary will be helpful for comprehension of the text and useful for the Integrated Speaking Task.
• Point out to students that some of the Key Words are content-specific collocations. Ask students to identify them. They are: antimicrobial agent, chemotherapeutic agent, and strain of bacteria. Resistant to and sensitive to are collocations as well, but are more general and not content specific.

Global Reading, page 150

Students read a text about antimicrobial resistance and analyze its content.

Summary of the Reading

“Resistance to Antimicrobial Drugs,” by R. W. Bauman, pages 150–152

This text focuses on the challenge microbiologists today face with pathogens (bacterial and viral) that resist antimicrobial drugs.

1. The process of resistance
   a. A resistant strain of bacteria is less efficient because it spends energy resisting genes and proteins. Resistant strains reproduce more slowly.
   b. When an antimicrobial is introduced, the less resistant cells are inhibited or die, but the resistant cells continue to grow, often faster, because there is less competition from other cells.
   c. Then resistant cells become predominant. Chemotherapy does not create resistant cells, but it does facilitate the replication of those already present.
2. Multiple resistance and cross resistance
   a. Multiple resistance occurs when a pathogen becomes resistant to more than one drug.
      • These types of bacteria develop in hospitals and nursing homes where there is constant use of various antimicrobials. Superbugs are pathogens that are resistant to most antimicrobials.
      • Superbugs pose unique problems because health professionals have to treat patients without effective drugs and protect themselves and other patients from infection.
   b. In cross resistance, pathogens may become resistant to different antimicrobials that have similar structures.

3. Preventing the development of drug-resistant pathogens
   a. Using high concentrations of drugs for a long period kills drug-sensitive cells and inhibits resistant cells long enough for the body to kill them. It is critical, though, that patients take all of the medication rather than saving it for another time.
   b. Combining drugs helps prevent the development of drug-resistant pathogens.
      • Cells resistant to one drug may be killed by the second.
      • Cells resistant to one drug may also be enhanced by the second. This is called synergism. For example, penicillin makes it easier for streptomycin to get into bacteria cells and interfere with their processes. Synergism can also occur by combining a drug and a chemical, such as penicillin and clavulanic acid.
      • Some drug combinations can interfere with each other.

4. Limiting the use of drugs
   Many drugs are available without prescription or are over-prescribed. Often, antibiotics are prescribed to treat viral infections, for which they are ineffective. Inappropriate use of antibiotics encourages the development of resistant bacteria by limiting the growth of drug-sensitive cells.

5. Developing new variations of existing drugs
   a. Adding a new side chain to a molecule creates a second-generation drug. If resistance to second-generation drugs occurs, third-generation drugs can be developed.
   b. Health care professionals and scientists are concerned about how long drug developers can stay ahead of resistant pathogens.

Go to www.MyAcademicConnectionsLab.com for Reading Activities 1–4.
Focused Reading, page 154

Students read the text again. They learn strategies and do activities designed to help them recognize a writer’s secondary, or rhetorical, purpose.

Review the academic skills focus: Recognizing a Writer’s Secondary Purpose.

- You may want to spend some time exploring the definition of rhetorical. Clarify for students that while rhetoric is often used to mean complex language that appears pretentious, it also means speech or writing that effectively communicates its point. A skilled writer (or speaker) will use rhetorical language as an effective communication tool.
- Similarly, while rhetorical can be used to describe language that is complex but insincere, it also describes the skill of using language effectively and persuasively. A rhetorical question is a question that is asked for effect only and requires or expects no answer. A common spoken rhetorical question used today is Why am I not surprised? It is used for effect in the context of a conversation, but an answer is not expected.

Go to www.MyAcademicConnectionsLab.com for Reading Activity 5.

Go to www.MyAcademicConnectionsLab.com for Checkpoint 2.

4 BUILDING ACADEMIC SPEAKING SKILLS

Make sure that students are familiar with the grammar point covered in MyAcademicConnectionsLab for this unit (modals: expressing degrees of necessity) before they begin this section. Go to page 13 in these Teacher’s Notes for the grammar chart.

Go to www.MyAcademicConnectionsLab.com for Grammar Check.

Highlight the purpose of this section, stated on the left. Tell students that they will practice taking their audience’s needs into account in preparation for giving an oral presentation. They will also write and deliver an oral presentation about fighting infectious diseases.
Before You Speak, page 156

Students learn about considering an audience in preparation for the Integrated Speaking Task.

Review the academic skills focus: Taking into Account Audience Needs.

Point out to students that the primary purpose of a speaker or writer is at the core of any presentation, written or spoken. Once a speaker (or writer) is clear about the purpose of the communication, he or she must also consider the audience.

Before students begin Exercise 1, page 156, call their attention to the heading of the chart at the bottom of the page. The presentation topic for the exercises in this section and the Integrated Speaking Task are the same. The question in the heading of the chart will help students prepare their responses to the question in the Integrated Speaking Task.

Focused Speaking, page 157

Students read and analyze a news article, determine its primary purpose, and practice using thought groups, intonation, and stress to express an opinion about antibiotic resistance.

Summary of the Reading

“Preserving Antibiotics' Usefulness,” by Linda Bren, page 158

1. Bacteria and viruses cause most infections.
   1.1 Antibiotics kill bacteria but not viruses.
   1.2 Viruses cause colds, flu, and most sore throats. They also cause most sinus infections, coughs, and bronchitis.

2. Every year doctors write millions of prescriptions for antibiotics even though there is no benefit to patients.
   2.1 The Center for Disease Control suggests that prescribing antibiotics could be reduced by more than 30 percent with no adverse effects to patients.
   2.2 Doctors over-prescribe antibiotics because they are uncertain about a diagnosis, have too little time, and are pressured to do so by patients.

3. Taking an antibiotic may be doubly harmful, because it doesn’t fight viruses and it increases the chances for a drug-resistant infection later.

4. Antibiotic resistance affects everyone, not just doctors and scientists. It would be helpful if people understood that many common illnesses, such as colds and flu, can’t be cured by antibiotics, so that they wouldn’t ask for them.
5. Things you can do to help prevent antibiotic resistance:
   5.1 If a health care provider says an antibiotic isn’t appropriate, don’t ask for one. Ask for alternative ways to relieve symptoms.
   5.2 Don’t take antibiotics for viral infections.
   5.3 Take medication exactly as prescribed. Take it until it’s gone, even if you feel better sooner.
   5.4 Don’t take leftover medications or medications that are for someone else. They may not be right for your symptoms and taking the wrong medicine might delay correct treatment and allow bacteria to grow.

Before students complete Exercise 3, page 159, elicit from them what they remember about thought groups, intonation, and stress. You may need to review the information on pages 145–147.

Go to www.MyAcademicConnectionsLab.com for Comprehension.


Integrated Speaking Task, page 159

The Integrated Speaking Task requires students to apply the knowledge they have acquired in this unit in order to prepare an oral presentation.

- Go over the Integrated Speaking Task assignment on page 159.
- Review Steps 1–7, pages 159–160.
- Return to Step 6 and elicit from students ideas for visuals they can create that are appropriate to their topics and audiences.
- You may want to re-examine Step 3, eliciting from students what they recall about the introduction, body, and conclusion of an oral report. Elicit from them the characteristics of an effective thesis statement: clear introduction of the topic, clear statement of opinion without using expressions, such as I think or My opinion is; the main points of the presentation; use of parallel structure.
- Provide ample time for students to research and prepare the report. You may want to assign preparation for homework.
- Once students have practiced their reports for a partner or small group and have reviewed their feedback, allow sufficient time for revision and practice. You may want to suggest that students revise for homework and practice in front of a mirror or video camera.

Go to www.MyAcademicConnectionsLab.com for Internet Activity and Academic Words Puzzle.
### GRAMMAR CHART: Modals: Expressing Degrees of Necessity

<table>
<thead>
<tr>
<th>Modals: Expressing Degrees of Necessity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modals and modal-like expressions can be used to express obligations, advice, expectations, and suggestions. In the present and the future, modals are followed by the base form of the verb. In the past, they are followed by <em>have</em> + past participle.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Affirmative</th>
<th>Necessity</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>must, have to, have got to</td>
<td>100%</td>
<td>must not, can’t, be not allowed to</td>
</tr>
<tr>
<td>had better, should, ought to</td>
<td></td>
<td>had better not, shouldn’t</td>
</tr>
<tr>
<td>be supposed to, be to</td>
<td></td>
<td>be not supposed to, be not to</td>
</tr>
<tr>
<td>could, might</td>
<td>0%</td>
<td>not have to</td>
</tr>
</tbody>
</table>

1. **To show strong necessity or obligation**, use *must*, *have to*, and *have got to*. They have a similar meaning.

   - **must** = obligation that can’t be avoided; formal
   - **have to** = used both formally and informally
   - **have got to** = used informally in conversation; not used in the negative (use *don’t have to* instead)

2. **Use will have to** to show future necessity. Use *had to* to show past necessity.

**Note**: Do not use *must have* + past participle. This form is used to speculate about an event.

The World Health Organization **must / has (got) to** continue to invest in research on antibiotic resistance.

If there is an outbreak, everyone **will have to** be vaccinated.

During the outbreak of SARS, doctors and health providers **had to** educate themselves quickly about the causes of the disease.

The virus **must have** been brought by someone who has recently traveled to Asia. (**It is almost certain that the virus was brought by someone who has recently traveled to Asia.**)
3. Use **must not** to say that it is necessary not to do something (something that is prohibited).

   **Note:** Although **must** and **have to** have the same meaning in the affirmative form, **must not** and **don’t have to** have different meanings. See point 8.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>You must not be in close contact with others if you think you have swine flu.</td>
<td>Incorrect: You <strong>don’t have to</strong> be in close contact with others if you think you have swine flu.</td>
</tr>
</tbody>
</table>

4. To express **strong advice**, use **had better** and **had better not**. Often **had better (not)** suggests that something unpleasant will happen if advice isn’t followed. **Had better** can contract to ‘**d better**.

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>We’d better get rid of that pool of stagnant water, or we’ll get mosquitoes.</td>
<td>We’d better <strong>not</strong> send our kids to school without proper vaccinations.</td>
</tr>
</tbody>
</table>

5. To offer **advice**, use **should** or **ought to**. They have the same meaning in most situations. Do not use **ought to** in questions and negatives; use **should** instead.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>You should / <strong>ought to</strong> take antimalarial drugs before traveling to Africa.</td>
<td>You shouldn’t take antibiotics if the disease is viral in nature.</td>
</tr>
<tr>
<td>You should have / <strong>ought to have</strong> gotten vaccinated before the winter. (= we <strong>didn’t</strong>)</td>
<td>We should have / <strong>ought to have</strong> gotten vaccinated before the winter. (= we <strong>didn’t</strong>)</td>
</tr>
<tr>
<td>You shouldn’t have gone to work with this cold. (= you <strong>did</strong>)</td>
<td>You shouldn’t have gone to work with this cold. (= you <strong>did</strong>)</td>
</tr>
</tbody>
</table>

6. To show **expectation**, use **be supposed to**. It is only used in the present and in the past. In the past, the affirmative suggests that the action didn’t occur; the negative suggests that it did.

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>You are / <strong>’re supposed to</strong> avoid taking antibiotics if your illness is viral in nature.</td>
<td>You were supposed to take this medicine every 12 hours. (= you <strong>didn’t</strong>)</td>
</tr>
<tr>
<td>You weren’t supposed to take antibiotics. The doctor said it was just a sore throat. (= you <strong>did</strong>)</td>
<td>You weren’t supposed to take antibiotics. The doctor said it was just a sore throat. (= you <strong>did</strong>)</td>
</tr>
<tr>
<td>I’m to stay on antibiotics for two weeks in order to clear this infection.</td>
<td>I’m to stay on antibiotics for two weeks in order to clear this infection.</td>
</tr>
</tbody>
</table>

**Note:** **Should** and **ought to have** are used to express advice about past situations. They suggest that the action did not occur. **Shouldn’t have** and **ought not to have** suggest that the action occurred.

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>You are / <strong>’re supposed to</strong> avoid taking antibiotics if your illness is viral in nature.</td>
<td>You were supposed to take this medicine every 12 hours. (= you <strong>didn’t</strong>)</td>
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<tr>
<td>You weren’t supposed to take antibiotics. The doctor said it was just a sore throat. (= you <strong>did</strong>)</td>
<td>You weren’t supposed to take antibiotics. The doctor said it was just a sore throat. (= you <strong>did</strong>)</td>
</tr>
<tr>
<td>I’m to stay on antibiotics for two weeks in order to clear this infection.</td>
<td>I’m to stay on antibiotics for two weeks in order to clear this infection.</td>
</tr>
</tbody>
</table>

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7. To make a **suggestion**, use **could** or **might** for the present and the future.

**Could have** and **might have** are used to make suggestions about a past opportunity that didn’t happen.

| **7.** To make a **suggestion**, use **could** or **might** for the present and the future. | You **might / could** try remedies other than antibiotics if you have a sore throat.  
| | The doctor **could have / might have been** more forceful in refusing to prescribe the antibiotics. (**but he wasn’t; the opportunity was lost**) |
| **Could have** and **might have** are used to make suggestions about a past opportunity that didn’t happen. | **8.** Use **don’t / doesn’t have to** to say that something isn’t necessary. In the past, use **didn’t have to** + base form of the verb to say that something was not necessary. | If you’ve already had chickenpox, you **don’t have to** be vaccinated against it.  
| | You **didn’t have to** get vaccinated; you’ve already had chickenpox. |

8. Use **don’t / doesn’t have to** to say that something isn’t necessary. In the past, use **didn’t have to** + base form of the verb to say that something was not necessary.
UNIT 7 ANSWER KEY

1 PREVIEW

Previewing the Academic Content

Exercise 1, page 136

1. c 4. f 7. e 10. i
2. d 5. b 8. a 11. j
3. g 6. h 9. l 12. k

Exercise 2, page 137

<table>
<thead>
<tr>
<th>Adjective + disease</th>
<th>Synonyms for infectious disease (adjective + disease)</th>
<th>Synonyms for get a disease (verb + a disease)</th>
<th>A synonym for a disease is spread by (a disease + passive verb + by or through)</th>
</tr>
</thead>
<tbody>
<tr>
<td>rare disease</td>
<td>contagious disease</td>
<td>develop a disease</td>
<td>a disease is transmitted by a disease</td>
</tr>
<tr>
<td>common disease</td>
<td>communicable disease</td>
<td>contract a disease</td>
<td>a disease is transmitted through</td>
</tr>
<tr>
<td>serious disease</td>
<td></td>
<td>have a disease</td>
<td></td>
</tr>
<tr>
<td>life-threatening</td>
<td></td>
<td>suffer from a disease</td>
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<tr>
<td>disease</td>
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<td>disease</td>
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<td></td>
<td></td>
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<tr>
<td>heart disease</td>
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<td></td>
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<tr>
<td>fatal disease</td>
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<tr>
<td>deadly disease</td>
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<tr>
<td>incurable disease</td>
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</tbody>
</table>

Exercise 3, page 138

Answers will vary. Students should use some of the vocabulary from the two tables.
Exercise 4, page 138
You will likely find that a disease is treated differently in different countries. In order to avoid catching infectious diseases, people can wash their hands, stay clean, drink clean water, avoid ill people, quarantine ill people, etc.

Previewing the Academic Skills Focus

Exercise 1, page 139

<table>
<thead>
<tr>
<th>Purpose: To inform</th>
<th>Purpose: To persuade</th>
<th>Purpose: To entertain</th>
</tr>
</thead>
<tbody>
<tr>
<td>textbooks, Internet articles, newspaper articles, operating manuals, political fliers, recipes, student essays, travel magazines</td>
<td>newspaper editorials, advertisements, Internet articles, junk mail, political fliers, student essays, travel magazines</td>
<td>novels, student essays, travel magazines, Internet articles</td>
</tr>
</tbody>
</table>

Exercise 2, page 140
1. This is an informative text because the paragraph contains many facts.
2. The writer does not repeat the data from the table in the paragraph, because this would be boring. The writer has brought a new perspective to the data in the table and has pointed out the main points that the reader should notice.

Exercise 3, page 140
This is a persuasive paragraph, which is evident from the strong statement at the end of the paragraph.

2 BUILDING ACADEMIC LISTENING SKILLS

Before You Listen

Exercise, page 141
1. first line of defense against
2. battle against / combat
3. killed
4. attack
5. vulnerable (or susceptible) to / outbreak
6. waged a war against
7. outbreak / keep the disease under control
Global Listening

Exercises 1, 2, and 3, pages 142–143

Students may list conditions that aren’t mentioned in the lecture.

<table>
<thead>
<tr>
<th>Conditions That Affect the Spread of Infectious Diseases</th>
<th>Mentioned in Lecture?</th>
<th>Order in Lecture (1, 2, 3, etc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. General health—if healthy, we are less likely to contract a disease</td>
<td>√</td>
<td>1</td>
</tr>
<tr>
<td>2. Whether we have access to clean water</td>
<td>√</td>
<td>2</td>
</tr>
<tr>
<td>3. How we prepare our food</td>
<td>√</td>
<td>3</td>
</tr>
<tr>
<td>4. How closely we live with others</td>
<td>√</td>
<td>4</td>
</tr>
<tr>
<td>5. How much contact we have with waste products</td>
<td>√</td>
<td>5</td>
</tr>
<tr>
<td>6. How closely we live to “agents of disease” like mosquitoes and rats</td>
<td>√</td>
<td>6</td>
</tr>
<tr>
<td>7. How much we travel</td>
<td>√</td>
<td>7</td>
</tr>
<tr>
<td>8. How likely we are to be exposed to a disease we don’t have antibodies for</td>
<td>√</td>
<td>8</td>
</tr>
</tbody>
</table>

Exercise 4, page 143

Answers will vary. Suggested answers:

<table>
<thead>
<tr>
<th>Conditions That Affect the Spread of Infectious Diseases</th>
<th>Notes from the Lecture</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. General health</td>
<td>If healthy, we resist disease better—opposite is also true</td>
</tr>
<tr>
<td>2. Clean water</td>
<td>Need clean water and water treatment systems water can contain parasites; parasites cause schistosomiasis, kill 200,000/yr.</td>
</tr>
<tr>
<td>3. Food preparation</td>
<td>Gastroenteritis—caused by bad food: meat, seafood, dairy, and baked products</td>
</tr>
<tr>
<td>4. Contact with other people</td>
<td>Large groups—more exposure to infectious diseases, so more vulnerability to infectious diseases</td>
</tr>
<tr>
<td>5. Contact with waste products</td>
<td>Waste contains parasites and bacteria, so important to minimize contact with waste More contact with waste = more opportunity to contract infectious diseases</td>
</tr>
</tbody>
</table>
| 6. Contact with “agents of disease” like mosquitoes and rats | Large groups of people attract mosquitoes and rats—carry disease  
For example, cutting down trees → pools of stagnant water, which brings mosquitoes |
|---|---|
| 7. Amount of travel | SARS, swine flu spread by travelers across borders  
Travel increases likelihood of exposure to new bacteria |
| 8. Exposure to new diseases we don't have antibodies for | Examples:  
Black Death = bubonic plague (Europe, mid-1300s)  
Native people in North America vulnerable to European diseases |

**Focused Listening**

**Exercise 1, page 145**
The instructor’s primary purpose was to inform. This is clear because the professor gave a lot of facts and detailed information. *Students may also consider that the instructor’s purpose includes a bit of persuasive intent, specifically to modify our behavior to avoid these infectious diseases.*

**Exercise 2, page 145**
1. c 2. b 3. a 4. b

**Exercise 3, page 146**
1. Deaths from each of the top five infectious diseases have also decreased, / except for deaths from AIDS.  
2. Over this time period, / deaths from AIDS have increased / by a factor of four.  
3. During this time span, / the relative rankings of the diseases has remained almost constant, / except for AIDS, / which has risen from seventh rank in 1993 / to second rank in 2002.
Exercise 4, page 146

1. In fact, with the onset of antibiotic resistance, it is possible that the decreasing trend will reverse itself in the future.

2. Second, without greater efforts at intervention, deaths from AIDS will likely surpass those from all other infectious diseases.

3. It is essential that governments and public health organizations, like the World Health Organization, continue to invest in research on antibiotic resistance and AIDS.

Exercise 5, page 147

1. Gastroenteritis, which is a disease of the stomach and intestines, is caused by improperly prepared foods, reheated meat and seafood dishes, and dairy and bakery products.

2. Also, most of us live in large groups, very large groups, and this makes us more vulnerable to infectious disease.

3. Similarly, large populations of humans tend to attract rats and other rodents that may also be agents of disease.

Exercise 6, page 148

1. astonishment / regret
2. astonishment / regret
3. concern
4. astonishment / regret

Exercise 7, page 149

1. doubt / disbelief
2. enthusiasm
Question following Exercise 7, page 149
There is greater stress on content words in thought groups. Intonation rises for positive statements and falls for negative ones.

3 BUILDING ACADEMIC READING SKILLS

Before You Read

Exercise 2, page 150
b. The strain of bacteria is exposed to the antibiotic. The antibiotic inhibits the sensitive cells. It does not inhibit the resistant cells.
c. The resistant cells remain. Without competition from the sensitive cells, the resistant cells reproduce faster.
d. The resistant cells have now become the majority in the population; they have become another separate strain of bacteria that is resistant to the original antibiotic.

Global Reading

Exercise 2, page 153
1. This author’s primary purpose is informative. We know this because the reading is full of factual information.
2. The topic is the development of antimicrobial / antibiotic resistance in populations of bacteria.
3. a. T  
   b. T  
   c. F  
   d. T  
   e. F  
   f. T  
4. Multiple resistance to antimicrobials appears most frequently in hospitals and nursing homes because the frequent use of antimicrobial medicines to combat infection in these places eliminates sensitive cells and encourages the development of resistant cells.
5. Cross resistance occurs when a population of bacteria becomes resistant to more than one antibiotic that have similar structures.
### Method How It Works

1. **Patients must finish all the antibiotic they are prescribed, even if they begin to feel better before they finish.**
   - High concentrations of the antibiotic will kill the sensitive cells and allow the body’s natural defenses to kill the resistant cells. This eradicates the entire population of bacteria and helps prevent the development of antibiotic resistance.

2. **Use antimicrobial drugs in combination.**
   - If bacteria cells are resistant to one antibiotic, they are likely to be sensitive to a different antibiotic. Combining antibiotics will kill all the bacteria cells (synergistic response). Avoid combining antibiotics that work against each other (antagonistic response).

3. **Use antimicrobials only when necessary.**
   - Antibiotics are often prescribed when they are not needed. They don’t work on viruses. If they are used too much, they simply encourage the development of resistant strains of bacteria and don’t do any good.

4. **Develop new antimicrobials.**
   - Medical researchers must continue to develop new antimicrobial drugs to fight the resistant strains of bacteria (second- and third-generation drugs).

7. Health care professionals are not sure how long we can keep developing new drugs for new resistant strains of bacteria.

### Focused Reading

**Exercise 2, page 155**

Sentence 1: introducing the third point of the section
Sentence 2: contrasting the ideal (limiting use of antimicrobials) with the reality (indiscriminate use of antimicrobials)
Sentence 3: quantifying a general statement; giving examples of inappropriate use of antibiotics
Sentence 4: giving another example of inappropriate antibiotic use
Sentence 5: emphasizing a point that was made previously; explaining why something should not be done (the dangers of using antibiotics inappropriately)
4 BUILDING ACADEMIC SPEAKING SKILLS

Before You Speak

Exercises 1, page 156

<table>
<thead>
<tr>
<th>Your Primary Purpose</th>
<th>Your Audience</th>
<th>Your Presentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>To inform</td>
<td>A group of children</td>
<td>don’t use technical terms spend more time explaining basic concepts keep it short achieve your primary purpose (to inform) by entertaining—maybe tell a story with a moral</td>
</tr>
<tr>
<td>To persuade</td>
<td>A group classmates and instructors who are well informed about your topic</td>
<td>can use technical terms spend less time on explaining concepts</td>
</tr>
<tr>
<td>To persuade</td>
<td>Parents who want antibiotic medicine when their young children develop an illness</td>
<td>don’t use technical terms spend more time on basic concepts use visuals to explain focus on situations where antibiotic use does more harm than good</td>
</tr>
<tr>
<td>To inform</td>
<td>Your classmates who have not read as much as you have about your presentation topic</td>
<td>assume some knowledge define new words classmates may not know use visuals</td>
</tr>
</tbody>
</table>

Focused Speaking

Exercise 2, page 159

The primary purpose of the text is to persuade people not to use antibiotics when they are not useful.