

Lesson 4.17: Life Science – Health: Effects of Disease

Weekly Focus: Reading Comprehension
Weekly Skill: Graphic Literacy

Lesson Summary: This week students will continue to study health with its relationship to the effects of disease on populations. Students have a reading to introduce them to ways the human body fights off potentially deadly diseases and to a population pyramid graph. It is followed by a second passage that will allow students to read about alternative medicine to counteract the effects of disease.

Note: Remind students of the Life Science Unit Review and Quiz for the next week

Materials Needed:

- Comprehension Reading & Graph [Unit 4.17 Handout 1](#) (6-way Paragraphs, Advanced Level, #65, pages 130 – 131)
- Comprehension Reading [Unit 4.17 Handout 2](#) (Spectrum Science, Grade 7, pages 112 – 113)
- Extra Work/Homework [Unit 4.17 Handout 3](#) (Spectrum Science, Grade 7, pages 110 – 111) and “cheat sheet”

Objectives: Students will be able to...

- Read comprehension passages with vocabulary related to health and the effects of disease on populations
- Practice skills with using graphs

College and Career Readiness Standards: RI, RST, WHST, LS

ACES Skills Addressed: EC, LS, ALS, CT, SM, N

Notes: Please review and be familiar with classroom routine notes for: reading for fluency strategies ([Routine 2](#)), 6-way Paragraph reading techniques ([Routine 3](#)) summarizing techniques ([Routine 4](#)), self-management skills ([Routine 1](#)). The notes for the different activities will help with making a smooth transition to each activity.

GED 2014 Science Test Overview – For Teachers and Students

The GED Science Test will be 90 minutes long and include approximately 34 questions with a total score value of 40. The questions will have focus on three content areas: life science (~40%), physical science (~40%), and Earth and space science (~20%). Students may be asked to read, analyze, understand, and extract information from a scientific reading, a news brief, a diagram, graph, table, or other material with scientific data and concepts or ideas.

The online test may consist of multiple choice, drop down menu, and fill-in-the-blank questions. There will also be two short answer questions (suggested 10 each) where students may have to design an experiment

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or identify errors in a conducted experiment, summarize, find evidence (supporting details), and reason or make a conclusion from the information (data) presented.

The work students are doing in class will help them with the GED Science Test. They are also learning skills that will help in many other areas of their lives.

Activities:

Warm-Up: Chronic Disease Prevention List

Time: 5 - 10 minutes

- As students enter the class, have the following written on the board or overhead: **“The Centers for Disease Control has listed on their website the benefits of physical activity. What do you think they are? Write a list in your journal or notebook and compare your answers with those of your classmates.”**
- (According to the CDC, the benefits are: control your weight, reduce your risk of cardiovascular disease, reduce your risk of type 2 diabetes, reduce your risk of some cancers, strengthen your bones and muscles, improve your mental health and mood, improve your ability to do daily activities and prevent falls (if you’re an older adult), increase your chances of living longer. – See if students have other examples and discuss them! You may even wish to discuss with students how much physical activity they do every day.)

Activity 1: Comprehension Reading & Graph (Unit 4.17 Handout 1)

Time: 40 - 45 minutes

- Hand out **Unit 4.17 Handout 1** to students.
- Explain to students they will continue to study Health: effects of diseases and their prevention. This information is important foundational knowledge for questions that may be on the 2014 GED Science module.
- Discuss with students that when reading for comprehension, there are many strategies to use: read the title to predict what the reading is about; look at the subheadings to get a better idea of what each section is about; if there are images, look at them to gain understanding; while reading remember to ask “What is this all about?”
- Reference Classroom Routine 3 for examples on how to use the 6-Way Paragraphs reading passages in class.
- Have students read the passage independently while answering the questions at the end. They can then move on to reading the information on the population pyramids.
- Circulate class while they are reading to make sure they understand the information presented and see if there are any questions.
- Review answers as a whole class. Ask students to point to the evidence from the reading passage that helped them determine the answer(s).
- If there is time, students can read for fluency in pairs and/or summarize the reading or paraphrase (write in their own words) the main idea.

Break: 10 minutes

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Activity 2: Comprehension Reading (Unit 4.17 Handout 2)

Time: 40 - 45 minutes

- 1) Hand out **Unit 4.17 Handout 2** to students.
- 2) Explain to students they will read about alternative medicine as it relates to preventing disease.
- 3) Discuss with students that when reading for comprehension, there are many strategies to use: read the title to predict what the reading is about; look at the words in bold and their definitions on the left side of page; if there are images, look at them to get a better understanding; while reading remember to ask “What is this all about?”
- 4) Have students read the passage and answer the questions independently.
- 5) Circulate class while they are reading to make sure they understand the information presented and see if there are any questions.
- 6) Review answers as a whole class – note: some answers may vary – ask students with different answers to discuss theirs with the class. Ask students to point to the evidence from the passage that led them to their answer(s).

Wrap-Up: Summarize

Time: 5 minutes

Have students turn to a partner (or write in their journals) about what they have learned today about the alternative medicine and population pyramids. Ask them to tell a partner one thing they learned today in one or two sentences. *Note: Use Routine 4 Handout*

Extra Work/Homework: Unit 4.17 Handout 3

Time: 30 - 45 minutes outside of class

Students can continue to read about the effects of disease with a Spectrum Science reading passage on “Brain Food”. This may be an applicable topic to get ready for next week’s unit review and quiz.

Differentiated Instruction/ELL Accommodation Suggestions

Activity

If some students finish early, they can turn their paper over and summarize the reading passage.

Activity 1

Teachers should be aware that ELLs could have a difficult time with some of the vocabulary and pronunciation encountered in the handouts for Activity 1 & 2. Encourage them to look for context clues in the reading that will help them with interpreting the main idea of each reading passage.

**Activity 1
& 2**

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Online Resources:

If students have Internet connection, they can read more about preventing chronic disease:

<http://www.cdc.gov/physicalactivity/everyone/health/>

http://www.alz.org/research/science/alzheimers_prevention_and_risk.asp

Suggested Teacher Readings:

- GED Testing Service – GED Science Item Sample (to get an idea of what the test may be like)

<http://www.gedtestingservice.com/itemsamplerscience/>

- Assessment Guide for Educators: A guide to the 2014 assessment content from GED Testing Service:

<http://www.riaepdc.org/Documents/ALALBAASSESSMENT%20GUIDE%20CHAPTER%203.pdf>

- Minnesota is getting ready for the 2014 GED test – website with updated information on the professional development in Minnesota regarding the 2014 GED.

http://abe.mpls.k12.mn.us/ged_2014_2

- Essential Education's 2014 GED Test Curriculum Blueprint (PDF)

<http://www.passged.com/media/pdf/educators/curriculum-blueprint.pdf>

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Unit 4.17 Handout 1 (graph)

Name: _____

Visual Information **WEEK 12**
DAY 3

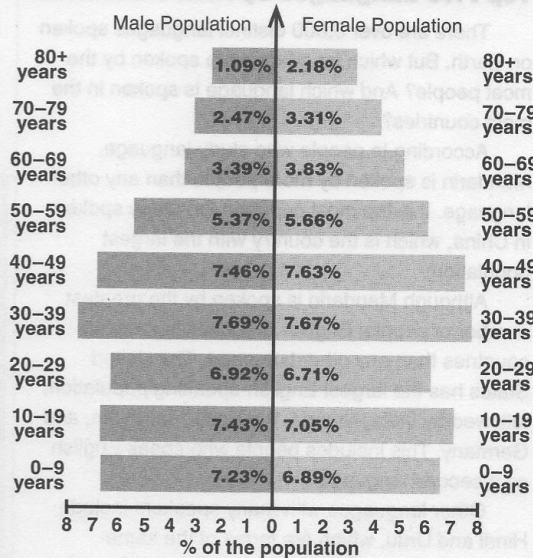
READ THE PASSAGE Look at the information presented in the graph.

Population Pyramids

How can you see an entire population at once? More than a quarter billion people live in the United States. That's a large number to understand, but statistics can give an overall view of the population's characteristics. A population pyramid is a graph used to show how an area's population is divided into ages and genders. Each bar in a population pyramid represents the percentage of the male or female U.S. population in a specific age range.

The shape of a population pyramid gives information about a population, too. For example, a pyramid that is wider on top than it is on the bottom means that there are more older people than young people. Reasons for this pattern might include a low birth rate, a high death rate among young people due to wars or disease, or the increase in the nation's young people moving to other countries. Similarly, a pyramid that is heavier on the bottom means there are more young people than old.

Age Distribution in the U.S. by Gender, 2000



SKILL PRACTICE Read each question. Fill in the bubble next to the correct answer.

- A decline in population growth can be caused by a _____.
 - high death rate
 - low death rate
 - high birth rate
 - low rate of people leaving the country
- Which generalization about the U.S. population is supported by the graph?
 - There are more females over 80 than males under 9.
 - There are more males ages 60 to 69 than females ages 60 to 69.
 - There are more females under 9 than males under 9.
 - There are more females over 80 than males over 80.
- A population pyramid for a country with a high birth rate as well as a high death rate would be _____.
 - shaped like a rectangle
 - shaped like an hourglass
 - wider at the bottom than at the top
 - wider at the top than at the bottom
- According to the graph and information in the passage, the U.S. population shows _____.
 - negative population growth
 - positive population growth
 - zero population growth
 - maximum population growth

STRATEGY PRACTICE According to the passage, why is the shape of a population pyramid significant?

Unit 4.17 Handout 1

TEACHER ANSWER KEY

Main Idea:

1. a. **N**arrow Idea
b. **M**ain Idea
c. **B**road Idea
2. C
3. D
4. A
5. B
6. B

Graph

1. A
2. D
3. C
4. B
5. Answers may vary – suggested answer: According to the passage, it is a way to view the characteristics of an entire population.

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4.17 Handout 2

TEACHER ANSWER KEY

1. false
2. true
3. false
4. true
5. false
6. false
7. true
8. *Answers may vary - Possible answer:* It means that a very small dose of something that produces an illness can cure a person of the same illness. This concept is used in homeopathy and with vaccines.
9. *Answers may vary - Possible answer:* The traditional treatment might not work, or they may want to try something more natural.
10. *Answers may vary - Suggested answer:* The foundation of chiropractic care is that illness can result when the spine is out of alignment.
11. *Answers may vary - Possible answer:* Complementary medicine is the combination of Western and alternative medical treatments. – The other answer will vary.

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4.17 Handout 3 (2 pages—“cheat sheet”)

ENVIRONMENT & HEALTH

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Biology

Big Picture

There are many environmental factors that can affect human health, including pollution, carcinogens, and bioterrorism. These three, if not properly controlled, will have severe effects on human health. Air pollution can worsen lung diseases or cardiovascular issues, and carcinogens can cause cancer. Bioterrorism, if not caught, can lead to death, as in the case of the anthrax scare in 2001.

Key Terms

Air Quality Index (AQI): Takes into consideration the levels of pollutants in the air and how these pollutants affect human health.

Pollution: When chemicals, heat, and noise are added to the environment beyond its capacity to absorb them.

Cancer: Disease that occurs when the cell cycle is no longer regulated and cells divide out of control.

Carcinogen: Anything that causes cancer, either naturally formed or created by man.

Tumor-Suppressor Gene: Normally works to prevent cells with damaged DNA from dividing.

Tumor: A cluster of cells that can either be benign or malignant.

Bioterrorism: When diseases are intentionally released or spread.

Air Quality & Pollution

If the **Air Quality Index (AQI)** is high, then people should not go outdoors because the pollutants can have severe effects on their health. Those with asthma, respiratory illnesses, or other lung problems should avoid exposure to polluted air, because it can make these problems worse. There are two main pollutants studied when figuring out the AQI:

- Ozone: A gas that forms when pollutants are heated by the sun.
- Particulates: Small particles that are formed as a result of burning fossil fuels.

Smog is a combination of the two pollutants above, and it is unhealthy to go outside when there is visible smog (visible smog means that the AQI is high).


AIR QUALITY INDEX	
Air Quality Index (AQI) Values	Levels of Health Concern
0 to 50	Good
51-100	Moderate
101-150	Unhealthy for Sensitive Groups
151-200	Unhealthy
201-300	Very Unhealthy
301 to 500	Hazardous

Image credit: EPA, Public Domain


While we may think that most pollutants are found outdoors, there are many harmful pollutants in the air inside our homes as well. Examples of indoor pollutants include mold, bacteria, radon, and carbon monoxide. Inhalation of carbon monoxide quickly leads to death.

All forms of pollution, not just air pollution, can have a negative impact on human health. Some of the health effects of pollution are shown to the right.

Air pollution



Water pollution



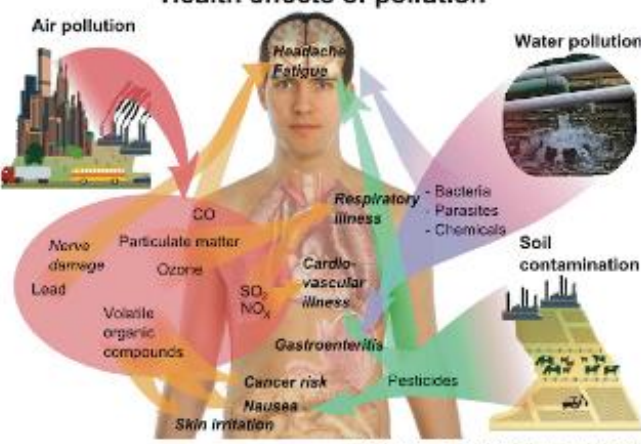



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This guide was created by Danielle Phan and Jin Yu. To learn more about the student authors, visit <http://www.ck12.org/about/about-us/team/interns>.

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Biology

ENVIRONMENT & HEALTH CONT.

Cancer

Cancer happens when a genetic mutation in a cell causes it to reproduce uncontrollably. Most **carcinogens** produce mutations in genes that control the cell cycle. For example, mutations in the **tumor-suppressor genes** could cause cells with damaged DNA to go unnoticed and reproduce, thus causing some sort of **tumor**.

Examples of carcinogens:

- Viruses (example: hepatitis B)
- Radiation (the most common is UV radiation)
- Tobacco smoke
- Chemicals in food

Tumor and cancer are not the same thing:

- If a tumor is benign, it remains at one part of the body and does not prohibit any of the body's normal functions.
- If the tumor is malignant, it can grow uncontrollably and can grow into other tissues.

Sometimes, cells of the malignant tumor can spread to other parts of the body via the bloodstream and then grow in other parts of the body, further weakening the body.

Treatment

When treating cancer, doctors try to remove the tumor without removing the healthy cells in the body. Surgery, chemotherapy, and radiation are all treatments that attempt to attain this goal.

A patient is more likely to beat the cancer and survive when the cancer is detected early and the tumor is still small and controllable. Knowing the early signs of cancer and getting routine tests help to detect cancer early.

Bioterrorism

Viruses, bacteria, or toxins produced by bacteria can be spread through the air, food, or water or through contact with the skin. One of the best-known incidents of **bioterrorism** in the United States happened in 2001 when someone sent anthrax spores through letters, infecting whoever opened those letters.

Notes

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4.17 Handout 3

TEACHER ANSWER KEY

1. C
2. D
3. *Answers may vary - Possible answer:* Meal B provides berries (a source of antioxidants), fish (a source of omega-3s), and whole grains (a source of complex carbs).
4. *Answers may vary - Possible answers:* Examples of food that contain essential fatty acids are fish, nuts, and legumes.
5. *Answers may vary - Possible answers:* Complex carbs, like whole-grain cereal, are digested more slowly, so they provide the body with a steady amount of glucose over a longer period. Chocolate-chip cookies have simple carbs.