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# Before We Read

## MY LEARNING GOALS

I can

- tell about my experiences with medical technology.
- compare and contrast different types of medical technology.

## Medical Imagery

Computers are ubiquitous. You can find them in homes, schools, and businesses. Computers help businesses create spreadsheets, analyze information, perform calculations, and communicate with employees and clients. Computers are also found in medical facilities. The computers that health professionals use can help diagnose medical problems. Machines take scans and images of the human body and computers help to create or analyze these images. Computers can analyze information to help doctors diagnose a problem and create a solution to help the patient get well.



## Comparing and Contrasting

When authors **compare** facts or ideas, they tell how they are similar. When they **contrast** facts, they tell how they are different. As you read, look for ways in which things are similar and different. Authors may use the words *both*, *like*, or *similarly* to indicate a comparison. They may use words or phrases such as *in contrast to*, *differs from*, *however*, *unlike*, or *but* to signal a contrast.

Use the information from the paragraph on page 92 and your own knowledge and experience to add other similarities and differences to the chart.

COMPUTERS IN OFFICES	COMPUTERS IN HOSPITALS
How are they alike?	
How are they different?	



## MY LEARNING GOALS

### I can

- read and understand an informational passage.
- compare and contrast using information from the passage and my prior knowledge.

## A View Inside the Body

Medical imaging is the technology used to look at the internal state of the human body. It is used to treat, diagnose, and monitor medical conditions. There are several different types of technology used in medical imaging. Each kind offers unique information about the area of the body that is being examined.

One type of medical imagery is ultrasound imaging, which is also known as sonography. Ultrasound imaging looks at soft tissues such as muscles and internal organs. It uses high-frequency sound waves. Ultrasound images can be made in real-time. For example, it can show blood circulating through the body and the movement of internal organs. Ultrasound images are made by placing a device on the skin. The device then sends out high-frequency sound waves. Those sound waves reflect off of the structures in the body and form an image on a monitor. Ultrasound images have been used for over two decades. They have an outstanding safety record. Unlike x-rays, ultrasounds do not expose patients to ionized radiation. Therefore, the health risks are negligible.



Neck ultrasound



Underline the word that means “so small or unimportant that it is not worth considering.”



What do you know about ultrasound images?

I know \_\_\_\_\_.



## Magnetic Resonance Imaging

Magnetic Resonance Imaging (MRI) is another type of medical imaging. It uses strong magnetic fields, radio waves, and computers to make detailed images of organs, soft tissues, and internal structures in the body. The information that an MRI can provide differs from the information provided by an ultrasound, x-ray, or computed tomography. An MRI can provide details that are not visible using other technology, such as brain, spinal cord and nerves, muscles, and tendons. MRI is often used to see the ligaments and cartilage of a knee joint or to detect shoulder injuries.



Hospital MRI control area



Circle an advantage of an MRI.



Who might have an MRI taken?

\_\_\_\_\_ might have an MRI taken.

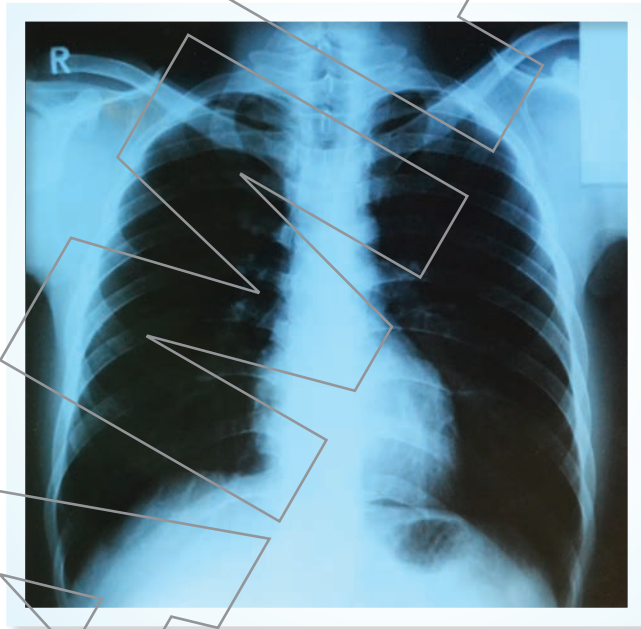


# Let's Read

## X-ray Technology

Differing from MRI is the x-ray. An x-ray uses ionizing radiation to make images of the body. Computed tomography (CT), fluoroscopy, and radiography are all types of medical imaging that use ionizing radiation. An x-ray beam passes through the body. The x-rays that are absorbed by the internal structures create a pattern. That pattern is then sent to a computer, which processes the image further.

Although radiography, fluoroscopy, and CT all use x-ray technology, they each serve a different purpose. Radiography is when a single, fixed image is made of the internal body. The image is then evaluated later. Dentists use radiography when they take images of teeth and doctors use them to look at bones.



Chest x-ray



**Highlight** what an x-ray uses to make images of the body.



What type of imaging is used in airport security?

Airport security uses \_\_\_\_\_.





## Fluoroscopy

Fluoroscopy, on the other hand, involves using a dye-like substance. This substance creates a continuous x-ray image, which shows on a monitor. As is the case with ultrasound images, fluoroscopy shows the internal body in real-time. For example, a doctor can watch the heart pumping or the motion of swallowing. This imagery is especially helpful for more complex procedures. However, during these procedures, fluoroscopy is used for extended periods of time. As a result, this type of x-ray involves rather high doses of radiation.

With CT, a device moves around a person's body while many x-ray images are made. A computer then turns all of those single images into a composite image that shows a cross section of the internal body. Because CT involves so many images, it requires a higher dose of radiation than other types of radiography.

Although some of these medical imaging technologies are used more often than others, together, they all help in the very important task of being able to look at the internal state of a body.



CT scanner



Reading a CT scan



Underline the word that means “hard to separate, analyze, or solve.”



What types of medical imagery are you familiar with?

I am \_\_\_\_\_.

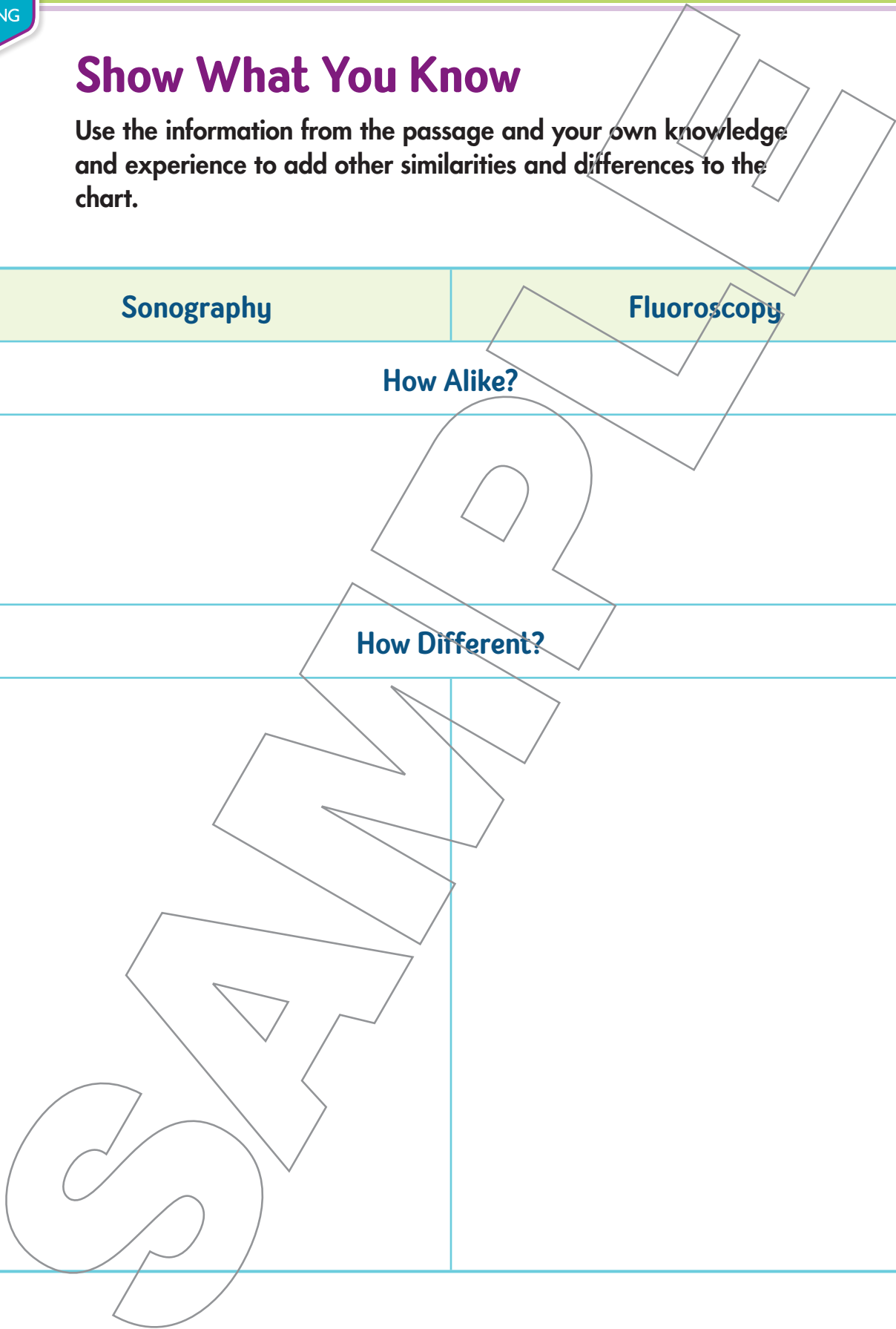


# Let's Read

## Show What You Know

Use the information from the passage and your own knowledge and experience to add other similarities and differences to the chart.

Sonography	Fluoroscopy
<b>How Alike?</b>	
<b>How Different?</b>	







## What Did You Learn?

Think about what you learned from the passage. Then circle the letter of the correct answer.

1. Which structure did the author use to organize the information in this passage?
  - A chronological order or sequence
  - B cause and effect
  - C compare and contrast
  - D problem and solution
2. Which word means “existing or occurring within your body”?
  - A internal
  - B negligible
  - C composite
  - D diagnose
3. Which type of imagery uses a dye-like substance to watch a process such as the heart pumping?
  - A x-ray
  - B fluoroscopy
  - C ultrasound
  - D CT scan
4. Which of the following would be best seen using an MRI?
  - A muscles
  - B swallowing motion
  - C bones
  - D teeth



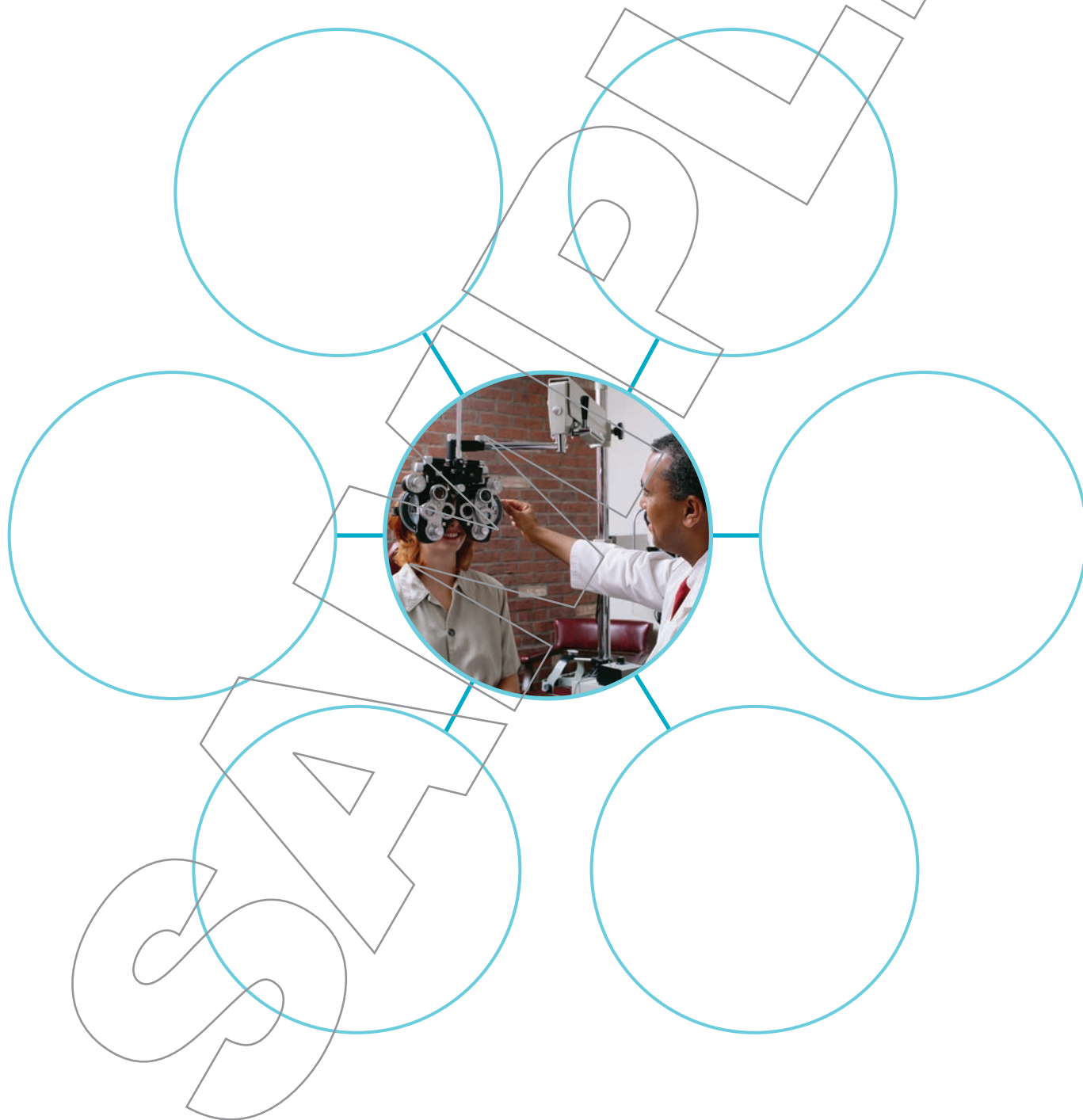
# Listen and Discuss

## MY LEARNING GOALS

### I can

- listen and understand a conversation about careers in the health field.
- participate in a discussion about what I learned.

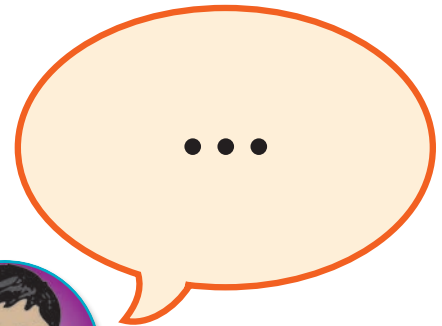
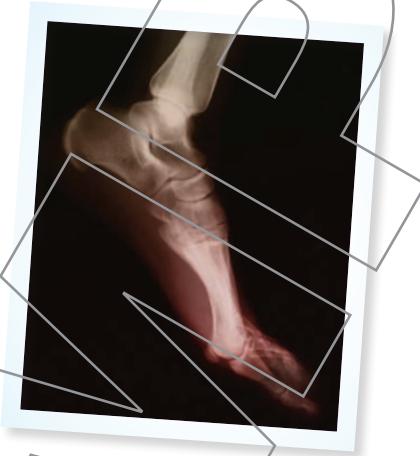
Listen to a conversation about jobs in the health field. While you listen the second time, take notes on the web below.



# Listen and Discuss



Which job in the health field would be suited to someone who is interested in sports?



# Learning About Language

## MY LEARNING GOALS

I can

- recognize root words.
- use root words to figure out the meaning of a word.

## Root Words

A **root word** is a basic word that a prefix or suffix has been added to. Sometimes the spelling of the root word changes when a prefix or suffix is attached. When the suffix *-al* is added to *nature* the final *e* is dropped.

The root word of *dietitian* is *diet*.

Read these sentences from the passage. Write the root word of the underlined words on the line.

1. One type of medical imagery is ultrasound imaging.
2. An MRI can provide details that are not visible using other technology.
3. This substance creates a continuous x-ray image, which shows on a monitor.
4. As a result, this type of x-ray involves rather high doses of radiation.
5. They all help in the very important task of being able to look at the internal state of a body.
6. The image is then evaluated later.

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# Learning About Language

Write the root word of each word on the line.

1. assistant \_\_\_\_\_

2. occupation \_\_\_\_\_

3. employee \_\_\_\_\_

4. information \_\_\_\_\_

Add a prefix or suffix to the root word to make a new word. Write a sentence using the new word.

1. pain \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. manage \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

3. health \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

4. possible \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



# Write About It

## MY LEARNING GOALS

### I can

- write a paragraph about medical technology.
- use knowledge of language and its conventions.

Think about the different ways doctors can diagnose medical conditions using medical imagery. Write a paragraph describing the different types of medical imagery and what they show about the human body.

## Plan My Writing

Fill in the chart with information about medical imagery.

MRI	CT
Radiography	Fluoroscopy
Sonography	X-ray





An ultrasound helps the doctor see \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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