



CELLS— Building Blocks of Life

LESSON

1

Amazing Cells

Plant cells and animals are more alike than different.

assumption dimension foliage
cell distinction membrane
commission final viewpoint
considerable

LESSON

2

Cells That Wouldn't Die

The cells of a dying cancer patient help keep us alive.

chance molecule sequence
component multicellular structure
fundamental prevail transfer
merge

LESSON

3

Fruit Fly, You're Just Like Me

Thanks to this insect pest, researchers know a lot about you.

experiment predominantly previous
flourish preserve sample
isolate presumably substitute
method



Watch a video introduction to this passage at vocabularyforsuccess.com.



Listen to this passage at vocabularyforsuccess.com.



plant cells

Plant cells magnified 160 times their normal size.

Amazing Cells

<textbook entry>

Cells are extraordinary things. They are the smallest functioning unit of any living organism, yet they are hugely important. Some cells are large in size (a chicken egg, for example, is considered a cell), but most are so small that they are invisible to the naked eye. Scientists know a great deal about cells, yet constantly commission studies to learn more.

It doesn't matter whether you are discussing animal or plant cells. From any viewpoint—whether you are talking about a skin cell, a stomach cell, a cell from a maple leaf, or one from a blade of grass—it's a fair assumption to say all cells have much in common. Every one has a nucleus that acts like the “brain” of the cell and controls its growth and reproduction.

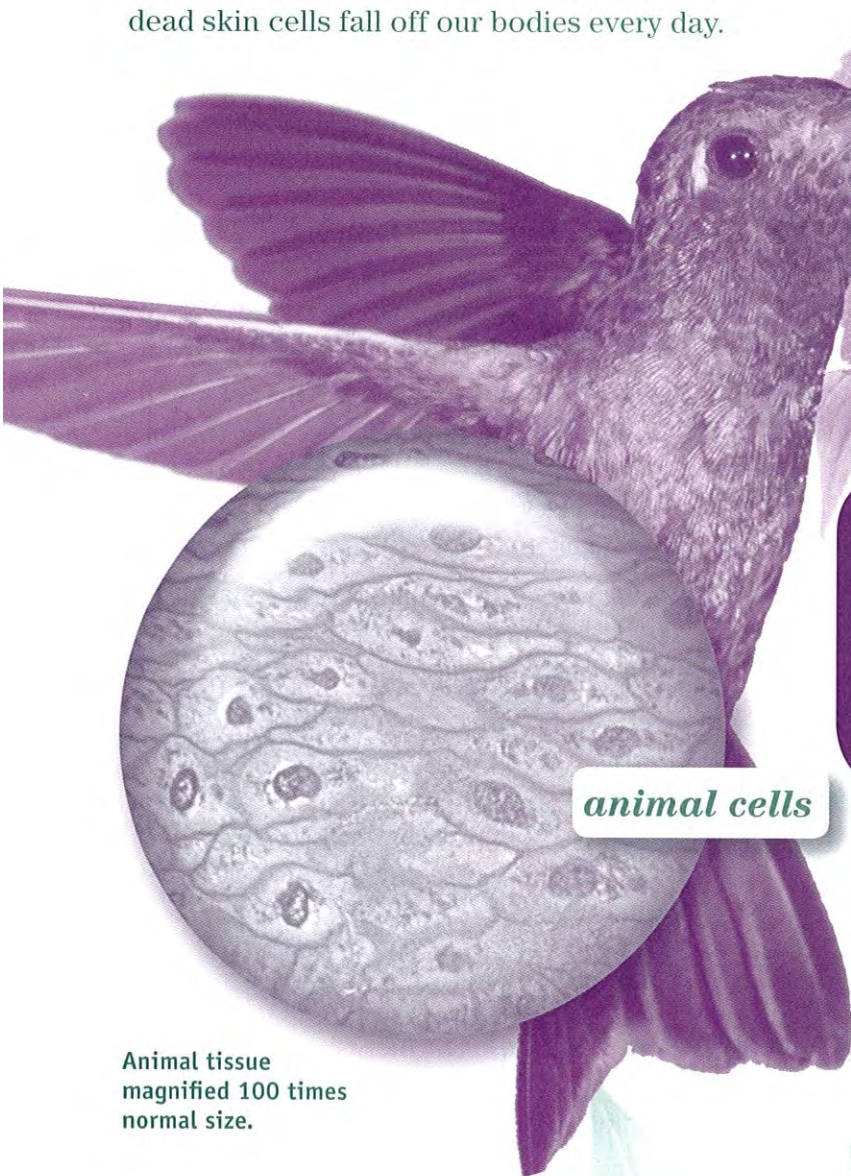
Each cell also has a membrane, or protective wall, that has the final say as to what gets in or out. Additionally, all cells need energy to live and grow. Notwithstanding these similarities, there are considerable differences among kinds of cells. Perhaps the greatest difference between animal and plant cells is that the cells in a plant's stem and foliage create the energy they need from sunlight. Animal cells, on the other hand, can't make their own energy.

Some cells, though small, are complete organisms by themselves. A germ, for instance, is a single-celled living organism. Other cells are parts of larger organisms. For example, our bodies contain many kinds of cells, such as stomach, brain, and skin cells. Each kind does

VOCABULARY

commission	final
viewpoint	considerable
cell	foliage
assumption	distinction
membrane	dimension

a different job. Scientists estimate that humans hold the distinction of having more than 10 trillion different kinds of cells in our bodies. Some live a long time, but others do not. An added dimension to cells is that when one cell dies, another usually replaces it. That's why we do not need to worry that more than 30,000 dead skin cells fall off our bodies every day.



animal cells

Animal tissue magnified 100 times normal size.

TALK ABOUT IT

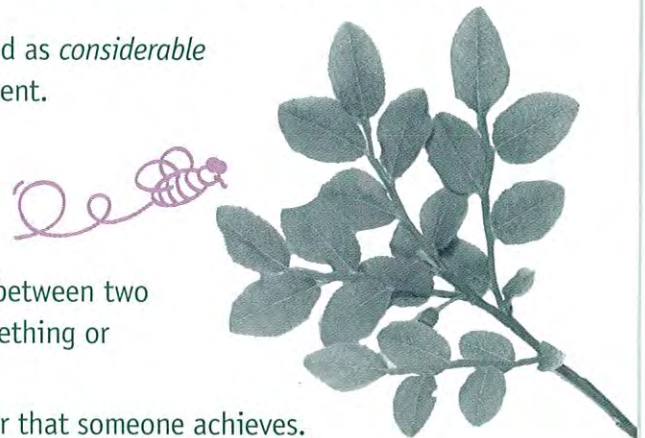
With a partner, answer the questions below. Use as many of the highlighted words in the selection as you can.

1. From your *viewpoint*, what are some other things that plants and animals have in common?
2. Give some examples and descriptions of *foliage* in your neighborhood.

Word Meanings

For each highlighted word on pages 2–3, the meaning is given below. For practice with other meanings, see pages 7–9. For synonyms and antonyms, see page 32.

1. **commission**
(kuh-MISH-uhn)
(v.) When people *commission* something, they pay someone to create or do something. Someone might *commission* an artist to paint his or her portrait.
(n.) A *commission* is the percentage of the total sale a salesperson receives.
2. **viewpoint**
(VYOO-poynt)
(n.) A particular way of thinking about something is a *viewpoint*. A person forms opinions based on his or her *viewpoint*.
3. **cell**
(sel)
(n.) A *cell* is the smallest unit of living matter that is able to operate independently in a body.
(n.) A small room, such as in a prison or a retreat, is called a *cell*.
4. **assumption**
(uh-SUHMP-shuhn)
(n.) When you make an *assumption*, you may suppose that a fact or a statement is true without checking the information.
5. **membrane**
(MEM-brayn)
(n.) A *membrane* is a thin, soft, flexible layer that covers and protects something, such as a cell. The thin layer around and between each section of an orange is the *membrane*.
6. **final**
(FEYE-nuhl)
(adj.) Something that is described as *final*, such as a *final* decision, is complete and cannot be altered or undone.
(n.) A *final* can be the last game in a series or the last test in a class.
7. **considerable**
(kuhn-SID-ur-uh-buhl)
(adj.) Something that is described as *considerable* is large in number, degree, or extent.
8. **foliage**
(FOH-lee-ij)
(n.) The *foliage* on a plant is all the leaves.
9. **distinction**
(diss-TINK-shuhn)
(n.) A *distinction* is a difference between two things or a feature that sets something or someone apart from others.
(n.) A *distinction* can be an honor that someone achieves.
10. **dimension**
(duh-MEN-shuhn)
(n.) A *dimension* can be the magnitude or extent of something, such as the *dimension* of a problem.
(n.) A *dimension* is a measurement in one direction, such as length or width.



Word Talk

Each lesson word has been placed in a category. With a partner, discuss and list items that belong in each category. Compare your results with those of another pair of students.

Places Where You See *Foliage*

Animals Whose Size Is *Considerable*

Things That Do Not Have *Cells*

Things with a *Membrane*

Decisions That Are *Final*

Work a Person Might *Commission*

Situations or Relationships with Many *Dimensions*

Possible *Distinctions* Among People

Issues or Concepts That You Have a *Viewpoint* On

Categories That People Make *Assumptions* About

Check for Understanding

Choose the lesson word that completes each sentence. Write the word on the line provided. Some words will be used twice.

assumption	considerable	foliage
cell	dimension	membrane
commission	distinction	viewpoint
	final	

- Each kind of _____ in the human body has a different purpose.
- The biggest _____ between my friend and me is that I don't like sports and she does.
- We made an incorrect _____ that you knew where we were meeting.
- After the tree was treated for a fungus, its _____ dramatically increased, and it was difficult to tell it had ever been sick.
- The PTA wanted to _____ the chorus to sing at the teachers' luncheon.
- One _____ of the environmental program is planting school gardens.
- The e-mail said we would have a/an _____ wait for materials because everything is out of stock and has to be specially ordered.
- The eardrum is a thin _____ that separates the inner and outer ear.
- A/An _____ is sometimes called the building block of life, because it is the smallest thing on which all life is built.
- My _____ grade turned out to be very good, even though my first test score was low.
- Your experience volunteering at the shelter has influenced your _____ on animal rights.
- A/An _____ number of bottles were collected for the recycling drive.



Expand Word Meanings

Read the paragraph below to learn other meanings for some of the lesson words.

As Jarus left his cell, he turned and looked around the small room. In a few hours he would graduate from the Space Academy and find out what his commanding officer planned for his future. Jarus knew his career would involve either space travel or earning a commission selling space vehicles. But first he had to attend the graduation ceremony, where he would receive a special distinction. He was being honored for his excellent work on the final. For this last project, Jarus researched the dimension of a shooting star to explain why it was brighter than others. The academy had trained him well for his future.

Note that in the paragraph on this page some of the lesson's words are used as a different part of speech or with a different meaning. For example, the word *final* is used as a noun. How are the other highlighted words used? Refer to page 4 to confirm meanings.

Apply Other Meanings

Complete each sentence with a highlighted word from the paragraph above.

1. During the last class, the teacher handed out ten questions for the _____.
2. If you don't cut each piece of wood to the exact _____, the bookcase you're building will end up being a crooked piece of furniture.
3. The real estate agent received a three percent _____ for selling the house down the street.
4. The _____ will show our teacher how much we learned in the last three chapters of our science book.
5. The prisoner was rarely allowed to leave his _____.
6. My friend achieved the highest _____ possible for someone in his career field.
7. Crystal's mother promised to pay her a _____ on any sales she made at the family yard sale.
8. The _____ contained only a mattress, a desk, and a small chair.
9. I need to measure the _____ of the bed to make sure it fits in the room.
10. Historically, retiring presidents have received an official _____ thanking them for their service during their time in office.

Word Associations

Use what you know about the lesson word in *italics* to answer each question. Circle the letter next to the phrase that best answers the question. Be prepared to explain your answers.



- Which of these would have *foliage*?
 - cactus
 - bush
 - mushroom
- What is an important purpose of a *membrane*?
 - to add
 - to undo
 - to protect
- Which of these does not have a *cell*?
 - rock
 - plant
 - animal
- Which worker would you most likely *commission* to do some work?
 - cashier
 - writer
 - bus driver
- If going to your room is the *final* thing you do each day, when do you do it?
 - first thing in the morning
 - in the middle of the day
 - last thing at night
- Which would be a fair *assumption*?
 - the name of a new teacher
 - who is absent from school
 - the month next school year begins
- Which would have a *considerable* variety of plants?
 - a florist
 - a football field
 - a rocky beach
- Which is a *distinction* between identical twins?
 - parents
 - names
 - facial features
- Which is NOT a *dimension* of a floor?
 - width
 - height
 - length
- Who holds the *viewpoint* that it is a bad idea to eat meat?
 - vegetarians
 - steak lovers
 - dogs



Check Again

Use what you know about the lesson word in italics to complete each sentence. Be sure your sentences make sense.

1. A *final* exam is _____
2. You can tell the *foliage* on a tree is healthy by _____

3. Something that covers a *considerable* part of the earth is _____
4. From a medical *viewpoint*, you should wash your hands before you eat because _____

5. You should never make an *assumption* about _____
6. A cell's *membrane* is important because _____
7. You might give someone a *commission* to do a job for you because _____
8. A *distinction* that sets me apart from others is _____

9. Although a *cell* is small, it is important because _____

10. The *dimension* I would measure to figure out how tall I am is _____

Challenge Yourself

Follow the directions to write sentences with the lesson words in italics. Be sure your sentences make sense both grammatically and in meaning.

Write
Your Own

1. Write a sentence about school using the word *considerable*.
2. Write a sentence using the word *distinction* in the fourth position.
3. Write an 11-word sentence with the word *assumption* in the sixth position.

Word-Solving Strategies: Suffixes

The suffixes **-sion**, **-tion**: “state, quality of,” “act of”

When you see an unfamiliar word while reading, you can often determine its meaning by breaking the word into its parts. A suffix is a word part that is added to the end of a root word. The meaning of a suffix may help you define a word. A suffix also will usually show you a word’s part of speech.

The suffixes *-sion* and *-tion* mean “state or quality of” or “act of.” These suffixes are often added to adjectives or verbs to create nouns. For example, look at the word *distinction* in this lesson. The adjective *distinct* means “separate or distinguishable.” By adding the suffix *-tion*, you create the noun *distinction*, meaning “the quality of being distinguishable or separate.”

Now see how adding a suffix to a verb can create a noun. Look at the word *assumption*

in this lesson. The noun was formed by adding *-tion* to the verb *assume*, which means “to take as true.” An *assumption* is “the act of taking something as true.” Note that even though the spelling changed when the suffix was added, you can still see how similar the words are.

Examples

These verbs have been changed to nouns by adding *-tion* or *-sion*.

attend → *attention*

respirate → *respiration*

adhere → *adhesion*

commit → *commission*

subdivide → *subdivision*

disperse → *dispersion*

Even when you see a word ending in *-sion* or *-tion*, you may not always be able to determine the word to which it was added. The word *dimension* in this lesson is an example. You cannot determine its root word, because it is derived from the Latin verb *dimetiri*, meaning “to measure out.”

BE CAREFUL!

Practice

Use what you’ve learned about the suffixes *-sion* and *-tion* to create nouns from the following verbs.

1. reduce _____

2. complete _____

3. divide _____

4. operate _____

5. prevent _____

6. fascinate _____

7. possess _____

8. profess _____

9. produce _____

10. revolt _____

Practice for Tests

Fill in the bubble next to the answer that best completes the sentence or answers the question.

1. Read this sentence.

Each visitor to the abbey slept in a *cell* during his or her stay.

Cell means:

- A tiny room
- B unit of living matter
- C part of the body
- D apartment building

2. The best antonym for *final* is:

- A last
- B top
- C end
- D first

3. A person who makes an *assumption*:

- A is skeptical of the truth
- B is confused by the truth
- C expects something to be true
- D wants something to be untrue

4. When you *commission* something to be done, you:

- A hire someone to do it
- B stop it from being done
- C begin to work on it
- D finish working on it

5. A word closely related to *dimension* is:

- A necessary
- B excess
- C length
- D elimination

6. Read this sentence.

During the ceremony, he received a *distinction* for his hard work.

Distinction means:

- A difference
- B similarity
- C gift
- D honor

7. A *considerable* weather event is a:

- A rain shower
- B hurricane
- C cloudy day
- D sunny day

8. Which of these does *foliage* NOT provide?

- A sunlight
- B shade
- C protection
- D color

9. A word associated with *viewpoint* is:

- A undoing
- B physical
- C belief
- D denial

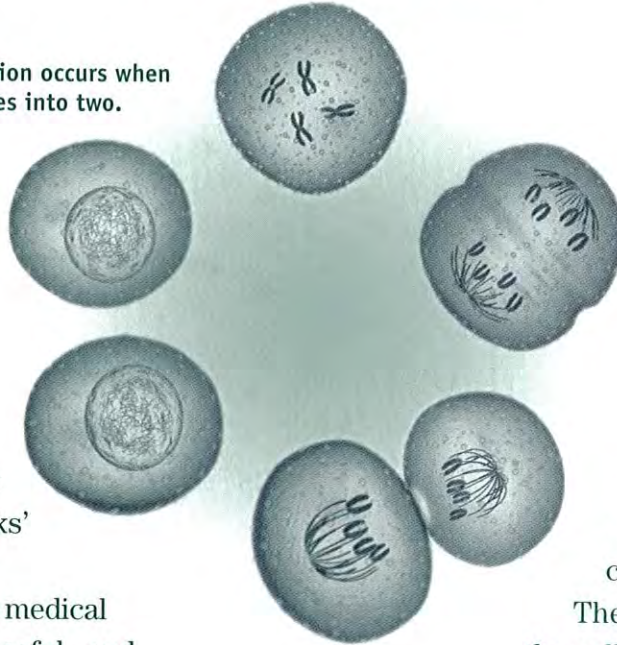
10. A function of a *membrane* is to:

- A move
- B cover
- C sell
- D destroy

Cells That Wouldn't Die

<historical nonfiction>

Cell reproduction occurs when one cell divides into two.



In 1951, during a routine cancer treatment, a doctor at Johns Hopkins Hospital took cell samples from a cancer patient named Henrietta Lacks. He took the samples without Lacks' knowledge, hoping they would prove useful in his medical research. They did prove useful—and not just to this one doctor.

To his amazement, twenty-four hours later, the number of cells had doubled. This was the first time human cells had ever grown in a lab. Later that year, Lacks died from her cancer without ever becoming aware of how famous her body's cells would become.

Cells grow because of cell reproduction. That's a sequence of events that causes a cell to copy itself by dividing in two. Each component, or part, of the new cell's structure is the same as the old one. Cell reproduction is fundamental to the way that people and other multicellular beings stay healthy. Sometimes, however, a chance event occurs. A DNA molecule inside a cell might divide incorrectly, causing the cell to become cancerous.

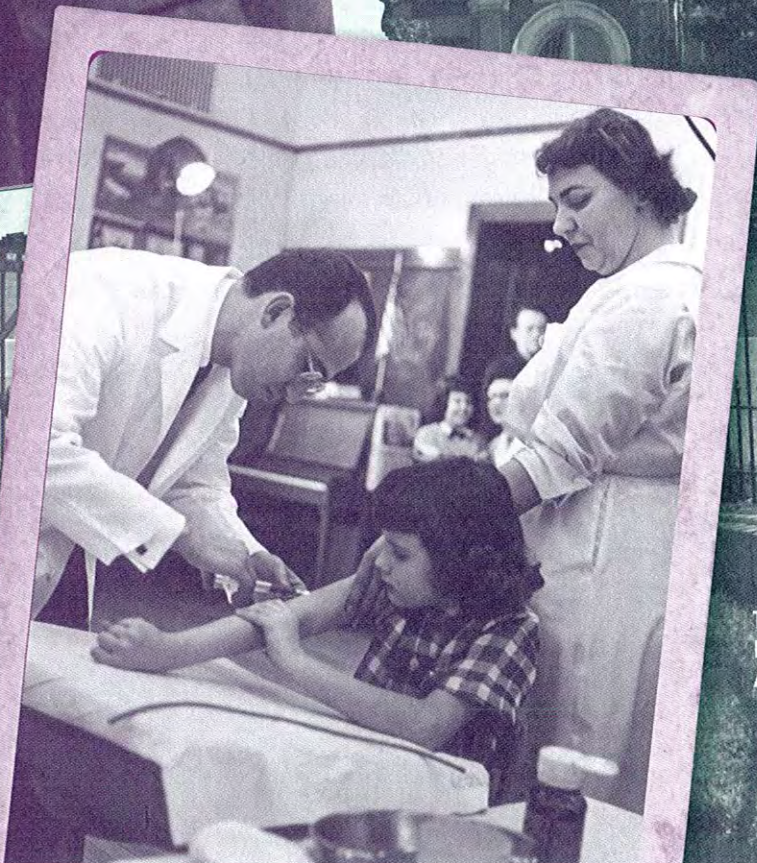
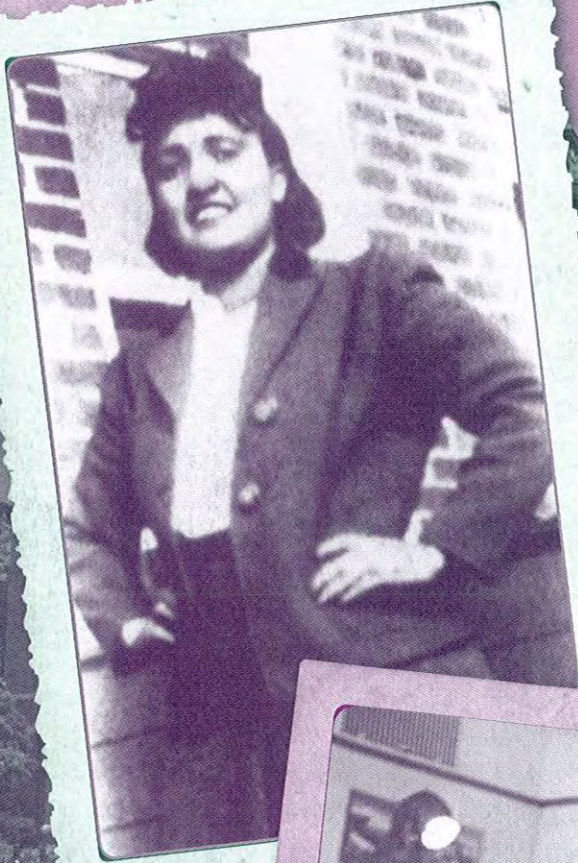
Lack's cells multiplied so rapidly, researchers had to transfer them to other storage dishes. Soon they had to move them to even more dishes. Eventually, the researchers had more cells than they needed.

The hospital began to give the cells away to other research labs. Sometimes there were problems. Cells can travel through the air on dust particles or scientists' unwashed hands. When Henrietta Lacks' cells did this, they were so strong they would merge with other cells and kill them.

Just three years after Lacks' death, research scientists were able to prevail in developing a polio vaccination. How? They used Lacks' cells to test the vaccine. Since then, researchers have used Lacks' cells to research cures for everything from cancer to the flu. Remarkably, the world did not learn of Lacks' important role in medical science until the 1970s. Even Lacks' family did not realize until long after her death that her cells were being used in laboratories. Now, six decades later, they know that Henrietta Lacks and the cells that wouldn't die helped change the world of medicine.

VOCABULARY

sequence chance
component molecule
structure transfer
fundamental merge
multicellular prevail



TALK ABOUT IT

With a partner, answer the questions below. Use as many of the highlighted words in the selection as you can.

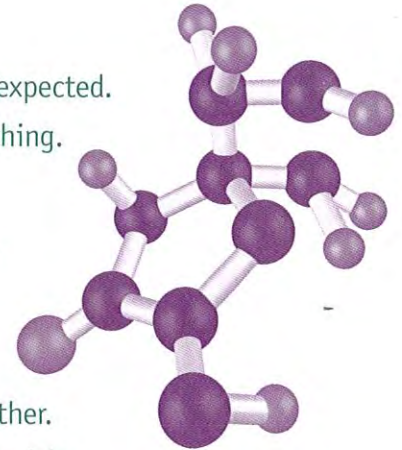
1. What *sequence* of events occurred that made Lacks so important?
2. In what ways did Lacks' cells help scientists *prevail* in their medical research?

Top left: Henrietta Lacks
Bottom left: A girl being vaccinated
Above: Johns Hopkins Hospital

Word Meanings

For each highlighted word on pages 12–13, the meaning is given below. For practice with other meanings, see pages 17–19. For synonyms and antonyms, see page 32.

1. **sequence**
(SEE-kwents)
(n.) A *sequence* is a connected or continuous series in a particular order.
(v.) When you *sequence* things, you put or arrange them in order.
2. **component**
(kuhm-POH-nent)
(n.) A *component* is an essential part or ingredient of something.
3. **structure**
(STRUHK-chur)
(n.) A *structure* is what is created from an arrangement or organization of parts.
(v.) When you *structure* something, you build or construct it.
4. **fundamental**
(fuhn-duh-MEN-tuhl)
(adj.) A *fundamental* idea or part serves as the basic element or foundation of something.
5. **multicellular**
(muhl-tee-SEL-yuh-lur)
(adj.) A *multicellular* organism has many cells.
6. **chance**
(chans)
(adj.) If an event is described as *chance*, it is unexpected.
(n.) A *chance* can be an opportunity to do something.
7. **molecule**
(MOL-uh-kyool)
(n.) A *molecule* is the smallest particle of a substance. You cannot divide a *molecule* without making the form of the substance different.
8. **transfer**
(TRANS-fur)
(v.) When you *transfer* boxes, you move or shift them from one place, person, or situation to another.
(n.) A *transfer* is an act or process of moving materials or people from one place or situation to another.
9. **merge**
(murj)
(v.) When two things *merge*, they combine or blend together.
10. **prevail**
(pri-VAYL)
(v.) When you *prevail* at something, you succeed or triumph after working hard.



Word Talk

Each lesson word is listed here. With a partner, take turns drawing a picture to illustrate the meaning of six of the words. As one partner draws, the other partner identifies the vocabulary word.

chance (adj.)

component

fundamental

merge

multicellular

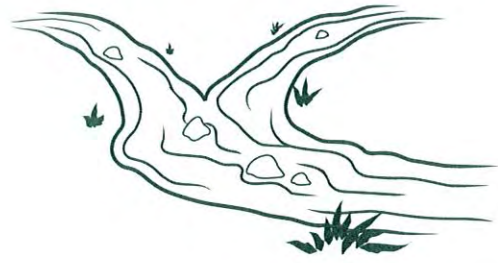
molecule

prevail

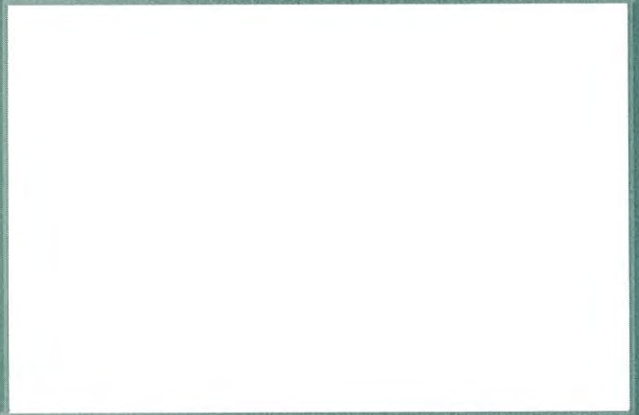
sequence (n.)

structure (n.)

transfer (v.)



merge



Check for Understanding

Choose the lesson word that completes each sentence. Write the word on the line provided. Some words will be used twice.



chance	merge	sequence
component	molecule	structure
fundamental	multicellular	transfer
	prevail	

1. Water and sunshine are _____ aspects of proper plant care.
2. You will need to do each step of the science experiment in _____ so that the results will be accurate.
3. In large _____ organisms, cells are specialized.
4. We have hired a van to _____ the furniture to our new apartment.
5. My company will _____ workers from the branch offices into one main office.
6. We discovered that an important _____ of the board game was missing when we opened the box.
7. I had to _____ all of my papers from my old binder to a new one.
8. We will _____ and win this game if we focus and think positively.
9. If you read a story out of _____, you may get confused by the order of events.
10. A _____ meeting with my friend resulted in unexpected plans to go to a movie.
11. You'll get an idea of a dinosaur's size by looking at the _____ of its skeleton.
12. One tiny change in the makeup of a _____ can damage a cell.



Expand Word Meanings

Read the paragraph below to learn other meanings for some of the lesson words.

Viruses are something no one wants to get. Once inside the body, they can enter cells and cause sickness. Now scientists see this ability of viruses as a chance to benefit people. They want to structure viruses so that viruses will cure people instead of only making people sick. Scientists want to sequence genetic material in viruses so that the disease-causing parts are removed. These new genes may help cure diseases. Scientists hope a virus can act as a transfer, carrying new genes into cells. The part of the virus that can insert itself into a cell will remain. But it will deliver copies of healthy genes to repair damaged cells.

In this paragraph, some of the lesson's words are used in a different way. Look at the word *chance*. Here it is used as a noun meaning "an opportunity." Look at the other highlighted words. Can you figure out their meanings and how they are used here? Refer to page 14 to confirm meanings.

Apply Other Meanings

Complete each sentence with a highlighted word from the paragraph above.

1. You may need to request a _____ if you want to work in another location.
2. We will need to follow the pattern carefully in order to _____ this complicated design.
3. Raquel decided to _____ the books from smallest to largest to make them look organized and neat on the shelf.
4. The _____ of our class from one room to another went smoothly.
5. The scientist was given a _____ to explain his methods when he met with his fellow scientists.
6. When you _____ the treehouse, be sure to use the strongest wood.
7. When the pitcher got injured, it gave me a _____ to play her position.
8. The director plans to _____ the dancers so that they come out on stage in a particular order.
9. I would welcome a _____ to show you the historical sights in my town.
10. The doctor has scheduled the _____ of the patient to a private room for tomorrow morning.

Word Associations

Use what you know about the lesson word in italics to answer each question. Circle the letter next to the phrase that best answers the question. Be prepared to explain your answers.

1. What is *fundamental* when building a new house?
 - a. large windows
 - b. a strong foundation
 - c. new carpet
2. Which event would be most likely to happen by *chance*?
 - a. going to an appointment
 - b. attending a wedding
 - c. catching a player's foul ball
3. Which phrase is closely associated with a *multicellular* being?
 - a. many cells
 - b. no cells
 - c. damaged cells
4. Which word would best describe the size of a *molecule*?
 - a. visible
 - b. microscopic
 - c. huge
5. Which are things that do NOT *merge*?
 - a. liquids
 - b. roads
 - c. people
6. What happens when someone gets a *transfer* in his or her job?
 - a. he or she moves within the company
 - b. he or she becomes unemployed
 - c. he or she goes on a vacation
7. What would most help a team *prevail*?
 - a. winning strategy
 - b. healthy snacks
 - c. supportive fans
8. Which material would you need to *structure* a brick house?
 - a. straw
 - b. cement
 - c. paint
9. Which is a way to *sequence* words?
 - a. capitalize
 - b. alphabetical order
 - c. numerical order
10. Which is a *component* of a computer?
 - a. keyboard
 - b. charts
 - c. e-mail



Check Again

Use what you know about the lesson word in italics to complete each sentence. Be sure your sentences make sense.

1. You know a story has no *sequence* when _____
2. An example of a *multicellular* organism is _____
3. A DNA *molecule* in a cell contains _____

4. Our team would welcome the *chance* to _____
5. A job *transfer* can be positive if _____

6. One thing that is *fundamental* to good study habits is _____

7. An example of something that can *merge* with something else is _____

8. The *structure* of many birds' nests can be described as _____

9. An important *component* of any recipe is _____
10. You can *prevail* over an obstacle if you _____

Challenge Yourself

Follow the directions to write sentences with the lesson words in italics. Be sure your sentences make sense both grammatically and in meaning.

Write
Your Own

1. Write a sentence using the word *sequence*.
2. Write a sentence using the word *chance* in the ninth position.
3. Write a 12-word sentence using the word *transfer* in the fourth position.

Word-Solving Strategies: Context Clues

Definition/Explanation

An author may give a definition or explanation of an unknown word. Reread this sentence from “Cells That Wouldn’t Die.”

Lacks’s cells multiplied so rapidly, researchers had to transfer them to other storage dishes. Soon they had to move them to even more dishes.

Note that an explanation of **transfer** is given in the sentence that follows the word. If you are unsure of a word, ask a peer for help, or check a dictionary.

You may not always find a definition or explanation right after an unfamiliar word. The author may define or explain a word before using the word, or a definition may be placed later in a paragraph or even in another paragraph. Also pay attention to the word *or*, which can point to a definition or explanation, and commas, which often appear immediately after a word and contain its definition.

BE CAREFUL!

Practice

A. Write the highlighted word and its explanation in the first two boxes. Use these context clues to write another meaning for the word in the third box.

On land, plants have the **capability** to produce their own food. This means they are able to create energy. Animals live by **predation**, in which they eat other animals or plants. In lakes and oceans this boundary becomes blurred. **Algae**, a large and diverse group of tiny aquatic organisms, behave like plants and create their own food. When they don’t get enough nutrients that way, they act more like animals by consuming other plants and even the animals that eat those plants.

WORD

EXPLANATION

WORD MEANING

B. Write a sentence for each of the highlighted words from the paragraph above. Use a definition or explanation context clue. You will use one word twice.

1. _____
2. _____
3. _____
4. _____

Practice for Tests

Fill in the bubble next to the answer that best completes the sentence or answers the question.

1. Read this sentence.

We will need to *transfer* those files to a folder before we send them.

Transfer means:

- A relocate
- B destroy
- C create
- D rewrite

2. A word closely associated with *molecule* is:

- A degree
- B monopoly
- C parcel
- D particle

3. A person who is able to *prevail* is:

- A frustrated
- B losing
- C successful
- D surviving

4. The opposite of *merge* is:

- A separate
- B combine
- C block
- D blend

5. In which activity is the *sequence* important?

- A floating
- B sleeping
- C cooking
- D drawing

6. Read this sentence.

She hopes she will have a *chance* to audition for the dance company.

Chance means:

- A appointment
- B examination
- C surprise
- D opportunity

7. A *multicellular* organism has cells that:

- A all do exactly the same thing
- B have particular functions
- C don't know what to do
- D do nothing

8. A *fundamental* part of keeping healthy is:

- A proper nutrition
- B warm clothing
- C little sleep
- D plenty of stress

9. When you look for a *component* of a computer system, you are looking for:

- A the directions
- B the best price
- C an essential part
- D an e-mail

10. The *structure* of a bicycle refers to:

- A how well it operates
- B how its parts are put together
- C the price you paid
- D its color

Fruit Fly, You're Just Like Me

<expository compare-and-contrast essay>

Presumably, people don't have much in common with fruit flies. After all, fruit flies are tiny creatures with red eyes that lay their eggs in rotten fruit. They live only about two weeks. However, previous generations of scientists proved that you and this pesky insect have more in common than you might think.

Cells contain genes that determine the traits a person or other living thing has. Human beings and fruit flies have predominantly the same genes. In fact, about 60 percent of them are identical. This similarity is one reason that fruit flies are a good substitute for human beings in scientific experiments. Their short life span

also means that they grow fast and flourish, allowing researchers to get information about many generations quickly.

In one experiment, scientists made a fruit fly's legs grow where its antennae were supposed to be. They discovered which genes kept the fruit fly's body parts in order. They also learned that people, too, have genes that tell their body parts to grow in a certain arrangement.

Sometimes differences are as important as similarities. Both fruit flies and people have brains that learn and remember. However, one major difference between fruit flies and people



VOCABULARY

presumably	experiment
previous	sample
predominantly	method
substitute	isolate
flourish	preserve

is that people are affected by peer pressure. As a result, researchers have studied fruit flies to see if the flies can become addicted to alcohol. Scientists reasoned that if fruit flies became addicted, it would have to be because of their genes, not social pressure. In fact, their sample of flies did become addicted, just as some humans do. To study this issue further, one researcher developed a method to isolate the fly genes that cause sensitivity to alcohol.

Although human and fruit fly biology are similar, there will always be one big difference between people and these pests. People like to preserve their fruit. That's not the case for fruit flies. To them, the rottener the fruit, the better.

Fruit flies like these are commonly viewed as pests, but they are valuable to research scientists. Right, researchers attached legs to this fly's face.

TALK ABOUT IT

With a partner, answer the questions below. Use as many of the highlighted words in the selection as you can.

1. Why do scientists use a *sample* of fruit flies to learn about human beings?
2. What *method* did researchers use to learn about addiction?



Word Meanings

For each highlighted word on pages 22–23, the meaning is given below. For practice with other meanings, see pages 27–29. For synonyms and antonyms, see page 32.

1. **presumably** (pri-ZOO-muh-blee) (adv.) *Presumably* means that you suppose something is true without proof. For example, *presumably* the show starts at 8:00 because it did last night.
2. **previous** (PREE-vee-uhss) (adj.) A *previous* event is one that took place before the present time.
3. **predominantly** (pri-DOM-uh-nuhnt-lee) (adv.) If two sisters are *predominantly* the same, they are alike for the most part, but they do have differences.
4. **substitute** (SUHB-stuh-toot) (n.) A *substitute* is a person or thing that takes the place of another, such as a substitute teacher who replaces a regular teacher.
(v.) If you do not have an ingredient for a recipe, you may be able to *substitute*, or use something else, instead.
5. **flourish** (FLUR-ish) (v.) Plants that *flourish* are thriving and growing well.
(n.) When you do something with a bold and showy gesture or a burst of activity, you do it with a *flourish*.
6. **experiment** (ek-SPIHR-uh-ment) (n.) An *experiment* is a test or a trial to discover something or verify an idea.
(v.) When you *experiment*, you try something to see what result you get.
7. **sample** (SAM-puhl) (n.) A *sample* is a single item or representative part of a larger group.
(v.) When you *sample* a new food, you take a small piece to try it out.
8. **method** (METH-uhd) (n.) A *method* is a way of doing something or a procedure that is followed to achieve a goal.
9. **isolate** (EYE-suh-layt) (v.) When you *isolate* something, you set it apart and away from others.
10. **preserve** (pri-ZURV) (v.) If you want to *preserve* something, you protect it to keep it safe from injury or destruction.
(n.) A *preserve* is a restricted area set aside to protect animals and plants.



Word Talk

Each lesson word has been placed in a category. With a partner, discuss and list items that belong in each category. Compare your results with those of another pair of students.

What Plants and
Animals Need to
Flourish

Things You Might
Try a *Sample Of*

Examples of
a Scientific
Experiment

Ways to *Preserve*
Things

Ideas That Are
Presumably True

Things That Have a
Method to Them

People or Things
That Might Need a
Substitute

Reasons to *Isolate*
Something or
Someone

Things That Are
Predominantly
One Color

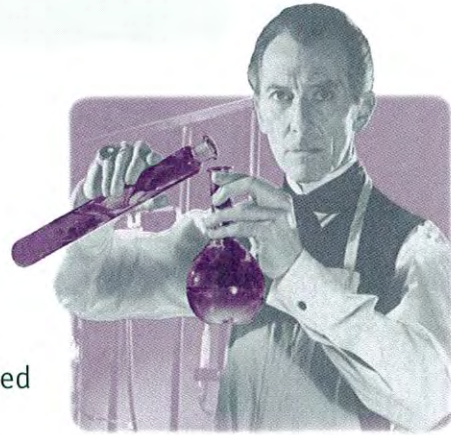
Things You Did on a
Previous Vacation

Check for Understanding

Choose the lesson word that completes each sentence. Write the word on the line provided. Some words will be used twice.

experiment	method	previous
flourish	predominantly	sample
isolate	preserve	substitute
	presumably	

- Our _____ proved that when you mix water and oil, the oil rises to the top.
- We developed a/an _____ similar to an assembly line to pack the boxes more quickly.
- I wasn't sure if I would like the ice cream, so I tasted a/an _____ before I ordered a cone.
- My flowers should _____ after I feed them this special plant food.
- Our _____ houseguest never made his bed, but the current one does.
- While the kitten is sick, you should _____ it from the rest of the litter so the others won't become ill.
- _____ you checked other sources before accepting the writer's statement as fact.
- One of the speakers was delayed, so a/an _____ was brought in.
- Let's review the _____ steps to see where you made the error in solving the puzzle.
- If we put the leftovers in the refrigerator, we can _____ them for a while.
- We can't agree because your ideas are _____ different from mine.
- We will need to conduct a/an _____ to see if our theory is correct.



Expand Word Meanings

Read the paragraph below to learn other meanings for some of the lesson words.

Imagine visiting a wildlife preserve in the future and seeing animals that have not existed for thousands of years. Scientists continue to experiment on cells from the bodies of frozen mammoths found in the Arctic ice. One day it may become possible to clone a mammoth. A scientist could sample DNA from cells. If the DNA is good, it might reproduce. A modern elephant, mammoths' closest living relative, could substitute for the mammoth's real mother. A live baby mammoth would most surely be introduced with a great flourish by the scientific world.

! Note that on this page, some of the lesson's words are used in a different way. For example, look at the word *preserve*. Here it is used as a noun and means "a place set aside to protect animals." Can you figure out the meanings of the other highlighted words? Refer to page 24 to confirm meanings.

Apply Other Meanings

Complete each sentence with a highlighted word from the paragraph above.

1. You can _____ applesauce for oil in a cake recipe and it will taste as good.
2. Never _____ by combining household chemicals, because it may be dangerous to mix them.
3. I would like to _____ that vegetable pie before I put a lot of it on my plate.
4. If you are not sure what color you want to paint the room, _____ by painting patches of color side-by-side on one wall.
5. When we visited the _____, I enjoyed seeing the lions the most.
6. We think it would be exciting if the play ended with a grand _____ by all the actors, because it would excite the audience.
7. We need to _____ a wagon to use for the hayride because the one we wanted to use is broken.
8. For some surveys, it's okay to _____ a few people from the group rather than ask for everyone's opinion.
9. A new _____ has been established to protect birds along the shoreline.
10. Greta signed her name with a/an _____ by making a lot of curls and writing in extra-large letters.

Word Associations

Use what you know about the lesson word in italics to answer each question. Circle the letter next to the phrase that best answers the question. Be prepared to explain your answers.

1. Which two things are *predominantly* the same?

- a. a cow and a wolf
- b. a push pin and a thumb tack
- c. a fly and a fish

2. Which kind of animal would you be most likely to find on a *preserve*?

- a. a farm animal
- b. a household pet
- c. a member of an endangered species

3. What is the best reason for developing a *method* to reach a goal?

- a. It creates definite steps.
- b. It's fun and satisfying.
- c. It leads to disorganization.

4. Who would be most likely to conduct an *experiment* in a laboratory?

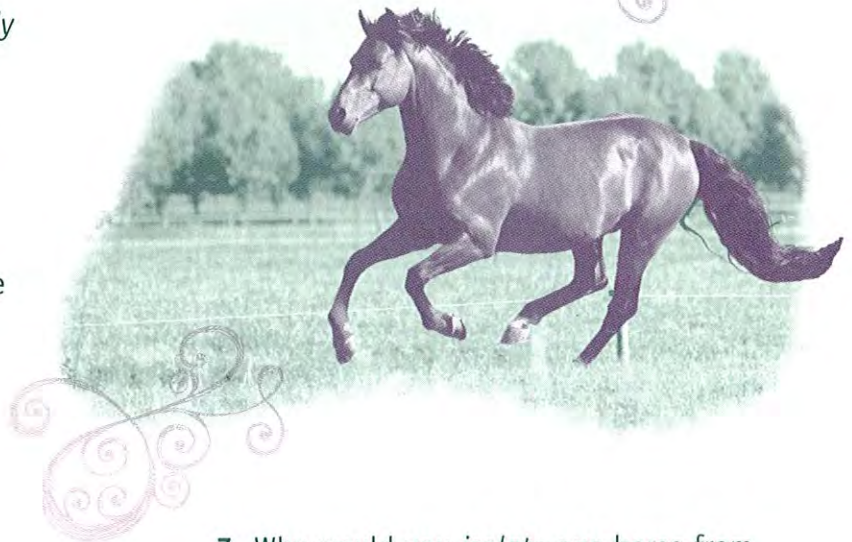
- a. engineer or builder
- b. chemist or researcher
- c. doctor or nurse

5. In which situation would a person NOT *sample* something or someone?

- a. a taste test
- b. a hot dog-eating contest
- c. a survey of student preferences

6. Which action would a person be most likely to complete with a *flourish*?

- a. sleeping
- b. tiptoeing
- c. waving



7. Why would you *isolate* one horse from the other horses?

- a. It keeps fighting the other horses.
- b. It is the herd leader.
- c. It likes eating the hay in the field.

8. Who would need an immediate *substitute* because of an injury?

- a. a student
- b. a baseball player
- c. a camper at a day camp

9. Which year is *previous* to 1963?

- a. 1964
- b. 1962
- c. 1970

10. Which group *presumably* knows best what the weather will be?

- a. forecasters
- b. reporters
- c. broadcasters

Check Again

Use what you know about the lesson word in italics to complete each sentence. Be sure your sentences make sense.

1. In *previous* talent shows, we _____

2. The area was *predominantly* farmland until _____

3. The best way to *preserve* your reputation as an honest person is _____
4. In sports, a *substitute* may be brought in when _____

5. It's important to conduct an *experiment* when you want to _____
6. *Presumably*, you can depend on friends to _____
7. I knew my garden would *flourish* when I _____
8. It's a good idea to *sample* something you're not familiar with before _____
9. A *method* I use to study for a test is to _____

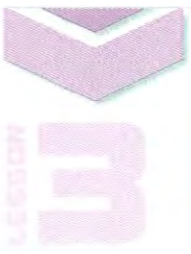
10. A good time to *isolate* yourself from others is when _____

Challenge Yourself

Follow the directions to write sentences with the lesson words in italics. Be sure your sentences make sense both grammatically and in meaning.

Write
Your Own

1. Write a sentence using the word *flourish*.
2. Write a sentence using the word *preserve* in the third position.
3. Write a 13-word sentence using the word *sample* in the seventh position.



Word-Solving Strategies: Prefixes

The prefix *pre-*: “before,” “in advance,” “in front of”

You learned about suffixes in a previous lesson. A suffix is a word part added to the end of a word. A prefix is another word part that is added to the front of a word. As with a suffix, you can use the meaning of a prefix to help you determine the meaning of a word.

An example of a prefix is *pre-*. It means “before,” “in advance,” or “in front of.” In fact, the word *prefix* contains the prefix *pre-*. It means “a word part fixed in front of a word.”

Take a look at the word *previous* from this lesson. It means “going before in time or order.” The meaning comes from the prefix *pre-* and the Latin root *via*, meaning “way or road.” The root may not always be recognizable, but the meaning of the prefix will still help you figure out the meaning of the word.

Another example is *preserve*, which means “to save or protect something before it is harmed.” Note how the meaning of the prefix is an essential part of the word’s meaning.

Examples

Look at these words with the prefix *pre-* and their meanings.

presell → to sell in advance
of a sale

prequel → a story that
tells what happens before
another story begins

precede → to go in front of

prevent → to stop
something before
it happens

premeditate → to think
about in advance

Sometimes it can be difficult to know the meaning of a word even when you know the meaning of the root word and the prefix. In this lesson, the definition of the word *predominantly* might be confusing. The word means “mainly, or for the most part” and not “in a manner that dominates in advance.” When you are not sure, check the context or look it up in a dictionary.

BE CAREFUL!

Practice

Use what you’ve learned about the prefix *pre-* to write a meaning for each word.

1. prepay _____
2. prehistory _____
3. prepackage _____
4. premodern _____
5. premature _____

6. preview _____
7. precondition _____
8. predict _____
9. prejudice _____
10. preheat _____

Practice for Tests

Fill in the bubble next to the answer that best completes the sentence or answers the question.

1. Read this sentence.

Her detailed statement about what happened is *presumably* correct.

Presumably means:

- A probably
- B doubtfully
- C questionably
- D not

2. A word closely associated with

flourish is:

- A decline
- B survive
- C exist
- D thrive

3. When you *sample* food, you:

- A eat the whole dish
- B prepare a new recipe
- C try a small part
- D buy a large amount

4. Which word might describe someone's *method*?

- A careful
- B dark
- C rich
- D alone

5. To *isolate* something does NOT mean to:

- A separate
- B seclude
- C include
- D detach

6. Read this sentence.

The scientist conducted an *experiment* to prove her theory.

Experiment means:

- A discovery
- B survey
- C plan
- D test

7. The opposite of *previous* is:

- A before
- B after
- C immediate
- D present

8. When you *preserve* something, you:

- A keep it
- B destroy it
- C change it
- D add to it

9. If a club is made up *predominantly* of women, its membership is:

- A very large
- B very small
- C mostly female
- D mostly male

10. A *substitute* coach is usually:

- A permanent
- B temporary
- C long-term
- D durable

Synonyms and Antonyms

In the following Word Bank, you will find synonyms and antonyms for some of the words in Lessons 1–3. (Remember: Some words have both synonyms and antonyms.) Study these words; then complete the exercises below.

significant difference initial thrive advanced integrate
separate principally destroy triumph subsequent order

A. For each sentence, fill in the blank with a **SYNONYM** for the word in boldface.

1. Orchids require very specific growing conditions in order to **flourish**, but a weed can _____ anywhere.
2. There is a definite **distinction** between teal blue and turquoise, but not everyone appreciates the _____.
3. Although a **considerable** sum of money had already been spent, a/an _____ amount was still required to finish the project.
4. The members of our team were **predominantly** beginners, but our opponents were _____ kids who had been playing volleyball for years.
5. We all hope that common sense will **prevail**, but in this situation it seems likely that greed and shortsightedness will _____.

B. For each sentence, fill in the blank with an **ANTONYM** for the word in boldface.

6. My _____ response to the question was wrong, so I thought about it more before offering my **final** answer.
7. If you're planning a trip to Paris, you don't need a/an _____ course in French. You just need **fundamental** instruction in conversational French.
8. The two lanes **merge** as they approach the bridge and then _____ again on the other side.
9. Our **previous** attempts to grow tomatoes hadn't been very successful. Then we planted them in a sunnier place and in _____ years we have had great success.
10. To **preserve** wooden lawn furniture, you should always cover it or put it in a shed for the winter. Leaving it exposed to rain and snow will eventually _____ it.

Word Study: Idioms

An **idiom** is a phrase that means something different from the literal meaning of its words. For example, **when it's raining cats and dogs**, there are no animals falling from the sky. **Raining cats and dogs** is an idiom for a heavy rainstorm.

The word *obvious* in Lesson 9 means “clear or easily seen,” as in “The solution to the problem is *obvious*.” All of the following are idioms that mean “obvious”:

as plain as day

staring you in the face

as plain as the nose on your face

right under your nose

Practice

Read each sentence. Use context clues to figure out the meaning of each idiom in boldprint. Then write the letter of the definition for the idiom in the sentence.

- | | |
|---|---|
| _____ 1. Ben's research paper is due on Monday, so he's been keeping his nose to the grindstone all week. | a. can not understand; be completely baffled |
| _____ 2. People say that four-year-old Casey is the spitting image of her aunt Kate. | b. everything; the entire package |
| _____ 3. Jed can't make heads or tails of the directions for putting together his new bike. | c. reveal a secret or confidence |
| _____ 4. When Alexis complained to her parents about her brother Sergei, her mom replied, " It takes two to tango. " | d. be equally at fault for causing a conflict |
| _____ 5. Elena's dad didn't want anyone to know his age, but someone must have let the cat out of the bag. | e. work extremely hard for long hours |
| _____ 6. Someday I'd like to visit Alaska and visit Nome, tour Denali Park, and cruise through the Inside Passage— the whole nine yards. | f. look very much like someone else |
| | g. have two bad days in a row |

Apply

Work with a partner to find out the meaning of each proverb. (Use an online or print dictionary.) Then work together to write a sentence for each idiom.

- | | |
|-------------------|----------------------------------|
| 1. easy as pie | 5. high on the hog |
| 2. on the fence | 6. until you're blue in the face |
| 3. off the hook | 7. steal someone's thunder |
| 4. the last straw | 8. the elephant in the room |

Vocabulary for Comprehension

Read the following passage, in which some of the words you have studied in Lessons 1–3 appear in boldface type. Then answer items 1–6.



Roundworms Have a Nerve

- The tiny roundworm has long been a widely used organism in medical and genetic research. This is **predominantly** because the roundworm and humans have thousands of genes with similar functions. Also, roundworms reproduce quickly, so they **flourish** in labs. In recent years, roundworms have helped scientists like Dr. Adela Ben-Yakar (above) study nerve regeneration in new ways. Researchers developed a **method** using lasers to cut the nerve **structure** in the roundworm. A worm was given an anesthetic so it would feel nothing. Then the precise laser made microscopic cuts that did no harm to the surrounding tissue. Within 24 hours, each nerve **cell** regrew.
- Scientists found the cells had fully recovered and worked as they had before.
- Nerve regeneration is not new. What was surprising in the **experiment** was the **considerable** speed at which nerve cells recovered. By using lasers in research, scientists hope to answer a **fundamental** question. They want to know why nerve damage is permanent in the human central nervous system. From the researchers' **viewpoint**, it is important to learn why a nerve cell that has been severed will sometimes regrow and other times will not. **Presumably**, when they find out why, they will help people who have been paralyzed from spinal cord injuries.

1. In sentence 2, **predominantly** means

- A mainly true
- B once true
- C possibly not true
- D absolutely true

2. When you develop a **method** (line 10), you plan a

- A surgery
- B exit
- C work day
- D procedure

3. Another example of a **structure** (line 11) in the body is

- A sense of taste
- B hearing
- C skeleton
- D hair

4. Another word for **considerable** (line 20) is

- A great
- B thoughtful
- C factual
- D shortened

5. The **fundamental** (line 22) question is

- A if lasers can help researchers
- B how fast a nerve cell regrows
- C why nerve damage is permanent in people
- D if roundworms have cells

6. A researcher's **viewpoint** (line 25) is

- A personal
- B business
- C artistic
- D scientific