

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



## Outcomes for Today

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Standards Focus: 1acegij 4d

### PREPARE

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

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We are beginning to move into the details and functions of the living cell. It is in the understanding of the concepts of cell complexity along with the specialization of cells and organelles that we can begin to understand the general principles of specialization in all living things. Talk about this in terms students can relate to such as specialization in jobs, schools, and families.

#### 2. Vocabulary Word Wall.

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

**membrane      chromosome      mitochondria      ribosome      chloroplast**

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

### READ

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

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

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

In this section, we begin to study the various parts of the cell.

To date, we have learned that:

All living things are made of cells.

Plant and animal cells share many similarities (except of cell walls and several other minor differences).

Plant cells have rigid cell walls.

Materials move in and out of individual cells through cell membranes.

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

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**5. Read text. Ch 5 *The Cell* Section 5.5 pp. 129-131**

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

setting	Characters	pages
plant and animal cells plant cell	nucleus, nuclear membrane, chromosomes, mitochondria, ribosomes cell wall, chloroplast	129- 130

### RESPOND

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

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

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

Students might mention:

The nucleus of a cell contains the genes and DNA. These materials are known as a “blueprint” or “plan” for future cells. They control heredity. “It is in the genes!” The “powerhouses” of the cells are the organelles known as “mitochondria.” This is where the ATP reactions take place.

Proteins are manufactured in ribosomes.

Plant cells contain chloroplasts which are green in color. Chloroplasts are where light energy is converted into chemical energy.

The internal skeleton of a cell is known as the cytoskeleton.

Cell walls in plants provide support and strength for the plant.

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

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

### EXPLORE

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

---

9. Explore today's simulation with inquiry activities.

---

10. Collect data and post.

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**One possible activity:**

**Cell Model Part II**

Refer back to Supplemental Student Investigation 5.3 (attached to the lesson plan for Week 1 Day 4). Now is the time to cut open the cell as the play-dough will be dried. Instruct students to carefully cut open their cell models. This is where the three-dimensional aspect becomes apparent. After the cell model has been opened, have students repair any damage. Students can then prepare their cell models for display. This is a good time to review the functions of the organelles included in their model construction.

Other possible activities for a  class  group or  individual

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

**Key Questions**

1. What is the function of the nucleus?
2. Draw a picture of a generalized cell and include the following:  
nucleus, mitochondria, chromosomes, ribosomes, chloroplasts, and cell wall
3. Pick four of these organelles and write a little about each one's function.
4. Why are the cell walls in plant cells so important?

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

**Key Paragraph**

In many cells, the most obvious organelle is the nucleus, a rounded body surrounded by a double membrane (two complete lipid layers) called a nuclear membrane. The inner membrane surrounds and encloses the nucleus of the cell. In many cells, the outer membrane of the nuclear membrane connects with the endoplasmic reticulum.

## EXTEND

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

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Let's try writing a limerick about cells.

For a little assistance go to one or both of these web sites:

<http://www.poetryteachers.com/poetclass/lessons/limerick.html>

[http://www.edu.pe.ca/stjean/playing%20with%20poetry/MacCormack/how\\_to\\_write\\_a\\_limerick.htm](http://www.edu.pe.ca/stjean/playing%20with%20poetry/MacCormack/how_to_write_a_limerick.htm)

Have students write a limerick to describe their cell model.

For example:

There once was some play-dough in class

This was transformed en masse.

Watch out! Creativity can be most dangerous in this arena!

### 12. Close with a short summary.

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

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



## Outcomes for Today

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Standards Focus: 1acegij 4d

### PREPARE

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

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There are two ways to study complex systems: parts to whole and whole to parts. Scientists often study living systems by breaking them down into component parts. We have been studying the cell by looking at the individual parts and how they relate to one another. How they come together is the subject of Chapter 5.

#### 2. Vocabulary Word Wall.

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

**energy      complex molecules      mitochondria      ATP metabolism**

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

### READ

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

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

- Mention the setting and main ideas.
  - Point to concept chart as you quickly review it.
- So far in this chapter, we have learned that all living things are composed of individual cells. These cells are themselves composed of smaller organ-like structures called organelles. It is now time to look at how cells are able to function as small living systems.
- This is also a good time to review the ATP – ADP cycle.

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

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**5. Read text. Ch 5 *The Cell* Section 5.6 pp. 131-132**

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

setting	Characters	pages
old clock	cogs, wheels, springs, bearings	131
a typical cell	mitochondria	132

## RESPOND

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

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

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

Students might mention:

All of the different parts of the cell are important to the cell.

Each organelle has a specific function.

You can't tell how all the parts work together just by looking at the individual parts (organelles).

Energy makes all of the chemical reactions in the cell possible.

All of the chemical reactions taken together in an organism are its metabolism.

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

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

## EXPLORE

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

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

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## 10. Collect data and post.

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### One possible activity:

#### Parts to the Whole

Prepare this activity by simply cutting out a variety of pictures from any magazines of student interest. These individual pictures should be part of something greater. Let your imagination wander. The object here is simply to provide students with the parts. They will create the whole.

#### Directions for students

We have seen that there are many small parts that make up the cell. How do scientists figure out what these parts do? In this activity, you will be given magazine cut outs of a variety of objects living and non-living. Your task is to arrange these individual pieces into the whole. For example, you might arrange a series of plants into a garden.

Other possible activities for a class group or individual

Bookmark Open Mind Portrait g6 Graphic Organizer

g7 Main Idea Graphic Organizer c1-12 Cubing Postcard Prop

Poster Ad Map Retelling Reader's Theatre Cartoon Rap

#### Key Questions

Why is it important for biologists to study individual living cells?

We have learned that mitochondria are the “powerhouses” of the cell. What might a biologist say about a cell that contains large numbers of mitochondria. Where might these cells be found?

What is metabolism?

Compare these two individuals: One is overweight by 50 pounds, yet both individuals have been eating the same amount of food as measured by calories. How might their individual metabolism rates account for their different weights?

What is the function of chloroplasts in green plants?

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

#### Key Paragraph

All the parts of the cell are important to the life of the cell. Each part has a particular role to play, but it is not always possible to tell what that role is just by looking at the part. If all the cogs, wheels, springs, and bearings of an old clock were spread on a table, you probably could not understand exactly how the clock works just by looking at the parts.

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

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Some humans have a slow metabolism rate and a low exercise routine. As a result they can put on a great deal of weight. A drastic but effective method to deal with such obesity (condition of extreme overweight) for some humans is the stomach stapling operation. Simply put, in this process, an operation is performed to reduce the capacity of a person's stomach. The result is that they cannot physically eat as much. What do you think about this?

Write a short paragraph explaining your answer.

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

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



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



## Outcomes for Today

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Standards Focus: 1acegij 4d

### PREPARE

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

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Particles in the universe are always in motion. Talk a little about this concept with various examples suggested by the students. Talk about how temperature is a factor in these motions. Look about the classroom for specific examples.

#### 2. Vocabulary Word Wall.

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

**concentration    diffusion    concentration gradient    osmosis**  
**cytoplasm**

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

### READ

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

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

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

In order for all living things to function, materials must move in and out of the organism. This is also true on a cellular level. Cells are small individual units of living organisms and, in many ways, function like a larger entity. Certainly, there are single cell animals. For cell (and larger organism) survival, liquids must move in and out of the individual cells.

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

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**5. Read text. Ch 5 *The Cell* Section 5.7 pp. 132**

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

Setting	Characters	pages
the cell	liquids	132

## RESPOND

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

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

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

**Students might mention:**

Atoms and molecules are always moving.

Atoms and molecules tend to move from areas of higher concentration to lower concentration. In other words, they move to areas that are less crowded.

A concentration gradient is a term used to describe how crowded a liquid (or gas) is with molecules. It ranges from greater to less crowded.

Diffusion is a process of molecules moving to the area of less concentration.

Osmosis is this process through a semi-permeable membrane.

A semi-permeable membrane allows only certain molecules through.

Diffusion is only one way through such a membrane.

Osmosis can cause cell membranes to break.

In plants, this does not happen as much because of the cell wall.

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

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

## EXPLORE

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

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

---

## 10. Collect data and post.

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### Two possible activities:

#### The Expanding Gummy Bear

In this relatively simple activity, candy gummy bears are placed in water in a clear container. Put several in the night before class and have students observe them the next day. (They will expand greatly due to osmosis.) Have them record their observations. Using the scientific method, have students predict what will happen to assorted materials that could be placed in water overnight. Examples of materials might include marbles, gummy worms, hard candy, etc. Observe these items the following day and complete the scientific method recordings.

#### Simple Diffusion

Observe figure 5:10 on page 132 of the text. Create several demonstration examples and follow the steps with food color. Add an ice cube to the mix. Have students predict the results beforehand. Another simple method is to place green Redwood cones (easily found in most Calif. cities) in water for similar effect. In all cases, have students predict and record their predictions first. They can simply follow up with their observations and conclusions.

Other possible activities for a class group or individual

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

#### Key Questions

From what you know about atoms and molecules, explain why you think they are in constant motion.

Give several examples of diffusion in everyday life.

Is secondhand smoke an example of diffusion? Why or why not?

What is a concentration gradient? How does it affect diffusion?

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

#### Key Paragraph

Atoms, molecules, and small particles are in constant motion. Although they may move in any direction, in general, molecules tend to move from an area where they are more concentrated to an area where they are less concentrated, until their concentration is the same everywhere.

## EXTEND

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

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The idea of concentration is key in this lesson. Have students draw a cartoon about the concept of concentration. Give them some parameters such as the semi-permeable membrane acting as a screen or some similar analogy. The idea here is to produce some small work of “metaphor” art to show the concept. Refer to the picture of the cell on page 45 of the Student Study Guide for an example.

### 12. Close with a short summary.

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

# CBL BIOLOGY: LIFE SCIENCE OPTION

BSCS Green Version 10th edition

*Biology An Ecological Approach*

Lesson Plan Quarter 2, Week 2, Day 4



## Outcomes for Today

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Standards Focus: 1acegij 4d

### PREPARE

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

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The movement of substances is a very important process in living systems. Understanding these principles will form the foundation for understanding the soon-to-be-studied physiological processes. Students need to have a base of understanding with examples they can relate to. For example, the process of how water is delivered to individual homes is a good example of the movement of materials. Talk with the students using examples they can understand.

#### 2. Vocabulary Word Wall.

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

**passive transport    expel    active transport    cytoplasm    cell membrane**

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

### READ

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

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

- Mention the setting and main ideas.
  - Point to concept chart as you quickly review it.
- Chemical reactions involve the transfer of energy. Energy can be transformed (photosynthesis and respiration), released (heat), and stored as well. Chemical reactions take place in living cells. Energy is required to move some substances in living things. The movement of substances into and out of cells is key to effective life functions in all living things.

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

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**5.** Read text. Ch 5 *The Cell* Section 5.8 pp. 133-134

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

setting	Characters	pages
animal	red blood cell	133
plant	plant root cell	

### RESPOND

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

---

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

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

Students might mention:

Not all substances can diffuse (move) through cell membranes.

Substances can diffuse (move) through plant cell walls.

There are ways other than diffusion and osmosis that material can move in and out of cells.

In active transport, energy is used to actively carry materials into or out of the cell.

In passive transport, other molecules assist in moving materials. There is no energy expenditure in this process.

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

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

### EXPLORE

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

---

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

---

## 10. Collect data and post.

---

### One possible activity:

#### Celery Stick Transport

Materials needed: celery stalk and water with red food coloring added.

Cut the celery stalk at an angle along the base for better absorption. Place the celery stalk in a small container of water saturated with red food coloring. Ask students to predict the outcome. Leave the celery in the water overnight.

As a variation, do this with two celery pieces. Place a light with a directed beam on one of the celery stalks. Ask students to predict if there might be any differences.

#### Transparency

Use transparency #11 in the transparencies book to help show the concepts of passive and active transport.

Other possible activities for a class group or individual

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

#### Key Questions

Which of these allows substance to move freely: The cell wall or the cell membrane?

Why is this so?

What is the name given to the movement of materials into and out of a cell that requires energy?

What happens if red blood cells are placed in pure water? Why is this so?

What happens if a plant root cell is placed in pure water? Why is this so?

What is the difference between passive and active transport?

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

#### Key Paragraph

The cell wall, if it is present, allows most substances to diffuse through it. The cell membrane, however, does not. This means that only certain molecules can diffuse through it freely.

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

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In passive transport, other molecules help move materials into and out of the cell. This process requires no energy expenditure. Write a short paragraph about a situation in which you have been helped to move somewhere and the person helping you enjoyed it.

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

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



**CBL BIOLOGY: LIFE SCIENCE OPTION**  
**BSCS Green Version 10th edition**  
*Biology An Ecological Approach*  
**Lesson Plan Quarter 2, Week 2, Day 5**



## Outcomes for Today

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Standards Focus: 1acegij 4d

### PREPARE

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

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This might be a good time to introduce the idea of the living hierarchy of complexity. Cells are simple units of life. In fact, a one-celled organism is an independent living form of life. As we look at the entire spectrum of living organisms ranging from the simple to the complex, we see that cells are essentially a smaller and simpler version. They carry out all life processes. We will now see that they can also reproduce.

#### 2. Vocabulary Word Wall.

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

**cell cycle      interphase      s-phase      mitosis      cytokinesis**

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

### READ

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

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

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

Cells operate like “mini-organisms” moving substances in and out and between their cell membranes.

Diffusion is one way in which cells are provided with needed materials while waste is removed.

In order for a cell to function well, it cannot be too large.

Individual cells cannot live indefinitely.

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

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**5. Read text. Ch 5 *The Cell* Section 5.9 pp. 135-136**

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

setting	Characters	pages
Living organisms	parent cells offspring cells	135- 136

### RESPOND

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

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

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

Students might mention:

Cells do not live forever.

Cells go through cycles ending with two new cells from the original one.

A cell's life between divisions is called the interphase. *Inter* means between.

Cells are active all the time.

The actual division of one cell into two is a process known as cytokinesis.

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

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

### EXPLORE

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

---

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

---

## 10. Collect data and post.

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### One possible activity:

This is a great website with many cell investigation activities:

<http://www97.intel.com/en/ProjectDesign/UnitPlanIndex/CellToCell/>

### Transparency 12

Make sure you use transparency 12 in the transparencies book. It is a good model for the cell cycle. Students could redraw this diagram with their own terms.

Other possible activities for a  class  group or  individual

Bookmark  Open Mind Portrait  g6 Graphic Organizer

g7 Main Idea Graphic Organizer  c1-12 Cubing  Postcard  Prop

Poster  Ad  Map  Retelling  Reader's Theatre  Cartoon  Rap

### Key Questions

What is a cycle? Give several examples.

What does the prefix "inter" mean?

Why is it important for genetic material to be duplicated first in the cell division process?

What is the difference between cytokinesis and mitosis?

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

### Key Paragraph

Division supplies cells with needed materials and helps remove waste products.

However, it takes a long time for substances to diffuse great distances. Therefore, if a cell is to function well, it cannot be too large. Usually, when a cell reaches a certain size, it begins a series of changes that permit it to divide into two cells.

## EXTEND

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

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Let's suppose just for the sake of argument that you could divide into two new individuals. Write a short paragraph on what each of you would choose to do with your individual new lives. Would each follow the same path? Would you remain friends? Let your mind wander.

### 12. Close with a short summary.

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