

# Chapter 32

## Bacterial cells



# Day One:

Today, you and your child will:

1. Read the text
2. Review the text with your child
3. Complete the student worksheets
4. Collect the materials you will need for days two and three

## National Science Education Standards covered this week:

Prokaryotic/bacterial cells require nutrients and water in order to survive. However, these organisms do not contain organelles to help with this task. Therefore, some bacteria use flagella to move them towards these resources while others make their own food through photosynthesis. In addition, bacterial cells protect themselves, much like plant cells, with the use of a cell wall.

**There are no new definitions for this chapter. It is intended to be a review of the cell organelles and a brief background into the structure of a bacterial cell.**

**Sample questions to ask your child after completing the weekly reading.**

**What are some ways that bacteria can get the nutrients they need to survive?**

Some bacteria can move towards a food source through the use of a flagella.  
Other bacteria can make their own with the help of chloroplasts.

**Which kinds of cells have a cell wall to protect them?**

Plant cells and bacteria have cell walls

**What is the main difference between bacterial cells and all other kinds of cells?**

Bacterial cells do not contain organelles. This is not the case for all other kinds of cells.

# Answers to worksheet questions:

## Page 1:

A flagella is a long whip-like tail that helps to push the bacteria through a liquid.

## Page 2:

	Plant cell	Animal cell	Bacterial cell
<b>Cell Parts</b>			
<b>DNA</b>	YES	YES	YES
<b>Cell membrane</b>	YES	YES	YES
<b>Cytoplasm</b>	YES	YES	YES
<b>Nucleus</b>	YES	YES	NO
<b>Ribosomes</b>	YES	YES	NO
<b>"ER"</b>	YES	YES	NO
<b>Mitochondria</b>	YES	YES	NO
<b>Lysosome</b>	YES	YES	NO
<b>Golgi body</b>	YES	YES	NO
<b>Vacuole</b>	YES	YES	NO
<b>Cell wall</b>	YES	NO	YES
<b>Chloroplast</b>	YES	NO	NO
<b>Chlorophyll</b>	YES	NO	SOME DO

# Unit Eight Review Answer Key

## Matching:

3 - mitochondria

5 - ER

6 - vacuole

1 - nucleus

4- Golgi body

2 - lysosome

Fill in the missing boxes with "yes" or "no"

	Plant cell	Animal cell	Bacterial cell
<b>Cell Parts</b>			
<b>DNA</b>	YES	YES	YES
<b>Cell membrane</b>	YES	YES	YES
<b>Cytoplasm</b>	YES	YES	YES
<b>Nucleus</b>	YES	YES	NO
<b>Chloroplast</b>	YES	NO	NO
<b>Cell wall</b>	YES	NO	YES

Be certain to go over your definitions for the test!

## Day Two:

Today, you and your child will:

1. Review Day One using the following text
2. Run the first activity this week

**The following text will give you the most important items to review for your activity today.**

The use of analogies is an effective way for children to identify the functions of cellular organelles.

The relationship between the organelles is the most important part of learning about these structures. In fact, none of these structures can survive without all of them working together.

# Cell mobile

## Objective:

Children will review the functions of cell organelles through the construction of a 3D mobile.

## Materials:

cardboard sheet (5"x36")

fishing line

duct tape

scissors

several different items chosen by the child

organelle review sheet (see attached)

## Procedure:

Bend the cardboard sheet around and overlap the ends by three to four inches. Duct tape these ends together to form a large hoop of cardboard. Poke a hole in the top of the hoop and attach a long piece of fishing line to the structure so that it can be hung from a sturdy structure. Do not hang it up at this time.

Use the attached sheet to review the organelles they have been studying. The child will need to find small objects that can fit into their "hoop" that may have similar functions. For example:

### **"ER" - toy car**

*The toy car moves people around like the "Er" moves protein around*

### **Mitochondria - candy bar**

*The candy bar gives us energy just like the mitochondria gives energy to the cell*

Once the child finds all the materials for each of the following organelles, they can start attaching them to the fishing line. The fishing line is then attached to the top of the cardboard loop with duct tape. The mobile can then be hung from a

stable structure so that the smaller objects are all contained within the cardboard hoop ("cell membrane".)

## Organelle Review Sheet

Organelle	Function	Object chosen
Nucleus	protects the DNA	
Ribosomes	Makes proteins for the cell	
"ER"	Sends protein messages to the organelles	
Mitochondria	Makes energy for the cell	
Lysosome	Gets rid of wastes	
Golgi body	Wraps up proteins for the cell	
Vacuole	Stores extra water and nutrients	
Chlorophyll	Makes food for a plant cell	
Flagella	Helps some cells move	



Cell wall	Protects a plant/bacterial cell	
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# Day Three: Lab Activity

Today, you and your child will:

1. Review Day One using the following text
2. Run the first activity this week

**The following text will give you the most important items to review for your activity today.**

Children learn by different means and the large amount of information that exists within this unit requires practice in order to understand.

A creative writing exercise provides a break from the typical science activity and allows a child to express themselves in other ways while still reflecting upon the scientific content.

## A bedtime story...

### Objective:

Children will write a bedtime story about all of the organelles they have studied so far.

### Materials:

paper and pencil

### Procedure:

Review the following organelles with your child:

<b>Nucleus</b>	<b>Vacuole</b>
<b>Ribosomes</b>	<b>Cell wall</b>
<b>ER</b>	<b>Chloroplast</b>
<b>Mitochondria</b>	<b>Chlorophyll</b>
<b>Nuclear membrane</b>	<b>Lysosome</b>
<b>Golgi body</b>	

Instruct them to use the analogies that have been provided, or make new ones up, to write a bedtime story.

You may need to provide them a possible beginning to the story such as...

*Once upon a time, there was an evil ruler named nucleus, who did nothing all day long but demand things be done for him...*

*or...*

*Once upon a time, there was a happy little candy maker named chlorophyll who spent all day long making sugary sweets for his town...*

## Review of analogies from Chapters 29-32:

The DNA (the boss) wants to send out messages but it cannot leave its office (the nucleus). So it makes RNA (the message) and sends it out into the cytoplasm for the ribosomes (the decoders) to read. The ribosomes read the message (RNA) and make new messages (proteins) that can be read by the other organelles. These new messages will tell the organelles what to do and when to do it.

Sometimes, these messages (proteins) are delivered faster by traveling on the "ER" (the highway). Other times, these proteins are sent outside of the cell after they are bundled up in the Golgi body (packing station). If any extra protein, nutrients or water is needed to be stored, it goes into the vacuole (the warehouse). When there is any waste that the cell makes, it goes to the lysosome (garbage disposal) to be broken down into smaller pieces.

# Test: Unit 8

## Chapters 29-32

Match the words in the second column to the best available answer in the third column. Place the correct number on the blank line.

_____	<b>mitochondria</b>	1) an organelle found inside chloroplasts that uses sunlight to make food for the cell
_____	<b>ER</b>	2) organisms belonging to the Kingdoms Archaeobacteria or Eubacteria
_____	<b>membrane</b>	3) body part that acts like a tail to move bacteria through a liquid
_____	<b>nucleus</b>	4) organelle that sends protein messages to other organelles
_____	<b>vacuole</b>	5) the largest organelle in a plant or animal cell; contains the DNA
_____	<b>chlorophyll</b>	6) a covering that surrounds animal cells
_____	<b>lysosome</b>	7) an organelle that stores extra water and nutrients
_____	<b>eukaryotic</b>	8) an organelle that turns nutrients into energy for the cell
_____	<b>flagella</b>	9) an organelle that gets rid of the cell's waste
_____	<b>cell wall</b>	10) cells or organisms that belong to any Kingdom except Archaeobacteria and Eubacteria
_____	<b>prokaryotic</b>	11) an organelle that wraps up proteins into a bundle inside a cell
_____	<b>Golgi body</b>	12) a stiff structure that surrounds and protects a plant cell

**Which one is right? Circle the correct answer.**

**1. The main difference between prokaryotic and eukaryotic cells is...**

- a) prokaryotic cells have organelles
- b) eukaryotic cells have DNA
- c) eukaryotic cells have organelles

**2. The difference between the "ER" and ribosomes is:**

- a) "ER" makes the proteins that the ribosomes send
- b) ribosomes make the proteins that the "ER" sends to other organelles
- c) the ribosomes are found inside the nucleus

**3. Plant cells are protected by:**

- a) a cell wall
- b) a cell membrane
- c) a cell wall and a cell membrane

**4. Cell walls can be found around...**

- a) bacteria
- b) animal and plant cells
- c) plant cells and bacteria

**5. "The boss" of a cell is the:**

- a) nucleus
- b) DNA
- c) mitochondria

**6. DNA sends messages to other cells by the use of:**

- a) Golgi bodies
- b) ER
- c) cytoplasm



# Test: Unit 8

## Answer Key

### Matching

8 mitochondria  
4 ER  
6 membrane  
5 nucleus  
7 vacuole  
1 chlorophyll

9 lysosome  
10 eukaryotic  
3 flagella  
12 cell wall  
2 prokaryotic  
11 Golgi body

### Multiple choice

1. c
2. b
3. a
4. c
5. b
6. a

### Write a story...

*Answers will vary. However, the child must use the words nucleus, ribosome, Golgi body and cell membrane within their description of how they (as a nucleus) will be sending a message to another cell.*