

LESSON V-1: Cells

Student Learning Objectives:

- V-1. Students will name the parts of a cell.
- V-2. Students will describe the functions of the parts of a cell.

Preparation

- Gather the needed materials.
- Determine which media is available for use with this lesson.
 - If you are using the filmstrip and cassette, *What Is a Cell?*, duplicate the Student Worksheet, What Is a Cell? so that each student will have a copy. Read the Teacher Reference, Audio Script/Teacher's Guide for *What Is a Cell?*
 - If you are using the video, *Bill Nye the Science Guy: Cells*, duplicate the Student Worksheet, Life: Brought to You by Cells, so that each student will have a copy.
- Personalize and then duplicate the Family Letter to be sent home with students following this lesson.

Materials

Equipment

- Overhead projector
- Filmstrip projector OR VCR and monitor
- Cassette player

Resources

- Filmstrip and Cassette: *What Is a Cell?* (10 minutes) OR Video: *Bill Nye the Science Guy: Cells* (first 10 minutes)
- Student Worksheet: What Is a Cell? OR Life: Brought to You by Cells
- Teacher Key: What Is a Cell? OR Life: Brought to You by Cells
- Teacher Reference: Audio Script/Teacher's Guide for *What Is a Cell?*
- Teacher Reference: Sample Family Letter Inviting Family Members to Volunteer

Realia

- Egg, raw
- Plastic wrap
- Rice, uncooked
- Pencils or pens

Time: 30 minutes

Lesson Procedure

Introduction: 2 minutes

Connect this lesson on cells with the previous lessons on digestion.

1. State:

If you think you know what I am describing when I say the words “mouth, esophagus, stomach, intestines,” point to your brain.

Call on students to share their ideas until the answer—digestive system—is given.

2. Explain:

We learned that the mouth, esophagus, stomach, and the other organs that make up the digestive system all work together to digest food, so it can be used by the cells of the body. Today, our lesson will be about the smallest part of our body.

Activity 1: 5 minutes

Label the parts of a cell.

1. Ask the students:

Who knows what the smallest part of our body is? Here’s a hint: It is so small, you can’t see it with the naked eye. [cell]

2. Write the word “cell” on the chalkboard and tell the students:

Our whole body is made up of cells. There are billions of cells in our bodies. Look at the skin on your hands. It is made of millions of tiny particles called skin cells. Your bones are made of bone cells, and your muscles are made of muscle cells. Every part is made of cells. Different cells have different shapes, but they all have three main parts. Let’s take a look at a cell.

3. Demonstrate the major parts of a cell:

- Place a piece of clear plastic wrap over the glass of an overhead projector.
- Turn the overhead on.
- Break a raw egg onto the overhead projector.
- Describe the nucleus (the yolk), the cytoplasm (the egg white), and the cell membrane (the outline of the egg white).
- Sprinkle a few pieces of rice onto the egg white to represent the tiny mitochondria.

4. Draw a cell on the chalkboard. Label it and compare its parts with the parts of the egg.
Explain:

This egg represents a cell. The yolk is like the nucleus of a cell. It is surrounded by cytoplasm, which is represented by the egg white. The outer edge is like the cell membrane, which encloses the cell. I added some small objects to represent some of the tiny parts, called mitochondria, that are in the cytoplasm.

Teacher's Note: The egg is indeed a single cell. Its cell membrane is the thin membrane which adheres to the inside of the shell. The nucleus is actually the small white area on the yolk, and the cytoplasm is the yolk and the egg white. Lesson V-3 will explore this further.

Activity 2: 20 minutes

Learn more about cells by watching a filmstrip or video.

Teacher's Note: One of two media is available for use with this lesson. If you have the filmstrip and cassette, *What Is a Cell?* follow Option 1. If you have the video, *Bill Nye the Science Guy: Cells*, follow Option 2.

Option 1

1. Distribute a Student Worksheet, *What Is a Cell?*, to each student. Explain:

We are going to watch a filmstrip about cells. As we watch, you can listen for the answers to the questions on your worksheet and fill them in. Let's read over the worksheet before we begin.

Ask the students to take turns reading over the items on the worksheet. Answer any questions they may have.

2. Show the filmstrip *What Is a Cell?*

Option 2

1. Distribute a Student Worksheet, *Life: Brought to You by Cells*, to each student. Explain:

We are going to watch a video about cells. As we watch, you can listen for the answers to the questions on your worksheet and fill them in. Let's read over the worksheet before we begin.

Ask the students to take turns reading over the items on the worksheet. Answer any questions they may have.

2. Show the first 10 minutes of the video *Bill Nye the Science Guy: Cells*. Stop the video after "The Cell, a Musical" and before the "Way Cool Scientist" begins.
3. Give the students a few minutes to complete their worksheets.
4. Go over the answers by calling on students to share their answers with the large group.

Closure: 3 minutes

- Summarize by saying:

Today we learned that cells are the small units of living matter which make up our bodies and the bodies of animals and plants.

Turn to your neighbor and name the three main parts of a cell. [cytoplasm, nucleus, and cell membrane]

- Send the Family Letter home for students to share with their families.
- State:

During our next health lesson, we will do some activities to learn more about cells and how they work.

WHAT IS A CELL?

Complete the following sentences. You might use some of these words for your answers:

cytoplasm	nucleus	cell membrane	mitochondria
nutrients	vacuoles	energy	oxygen
microscope	blood	small intestines	

1. Draw and label a cell showing its three main parts:

2. People discovered more about cells after the invention of the

_____.

Why is this so? _____

3. Are all cells the same shape? _____

Why? _____

WHAT IS A CELL?

4. Name two of the structures within the cytoplasm and write what happens in each of them:

Structure	What Happens?
_____	_____
_____	_____
_____	_____

5. Your cells need oxygen from the lungs and nutrients from food in order to get the _____ you need to move and do work.

6. The food you eat has to be broken down into small pieces, called molecules, and dissolved (become liquid) so that it can soak through the cell membrane around your cells. The cell membrane is so thin that it allows

7. Chemicals, called enzymes, in your stomach and _____ help to dissolve your food.

8. The dissolved molecules of food and nutrients are taken to your cells by the _____.

9. What else, besides food, does your blood carry to your cells?

10. The oxygen helps the cells burn food to create _____ in the cells.

11. In what part of the cell is most of the energy created?

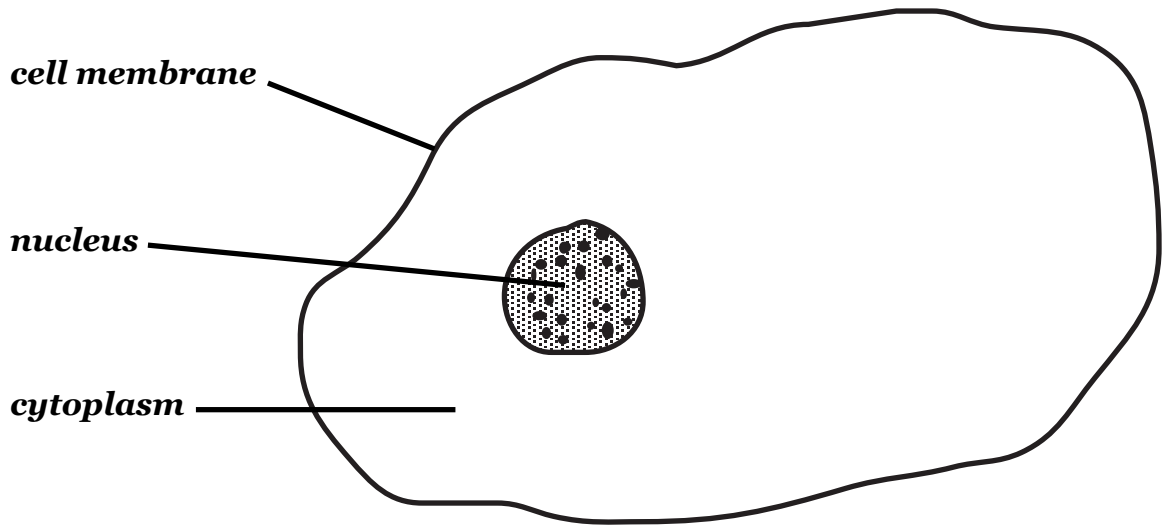
12. How are plant cells different from animal cells? _____

WHAT IS A CELL?

Complete the following sentences. You might use some of these words for your answers:

cytoplasm nucleus cell membrane mitochondria
nutrients vacuoles energy oxygen
microscope blood small intestines

1. Draw and label a cell showing its three main parts:



2. People discovered more about cells after the invention of the

microscope.

Why is this so? Cells are too tiny to see with the human eye.

3. Are all cells the same shape? No

Why? They have different shapes because they have different jobs to do.

WHAT IS A CELL?

4. Name two of the structures within the cytoplasm and write what happens in each of them:

Structure	What Happens?
<u>vacuoles</u>	<u>store nutrients, such as food and water</u>
<u>mitochondria</u>	<u>use nutrients to generate energy</u> <u>for the cell's work</u>

5. Your cells need oxygen from the lungs and nutrients from food in order to get the **energy** you need to move and do work.

6. The food you eat has to be broken down into small pieces, called molecules, and dissolved (become liquid) so that it can soak through the cell membrane around your cells. The cell membrane is so thin that it allows **food, oxygen, chemicals, and other substances to**
soak into the cytoplasm of your cells.

7. Chemicals, called enzymes, in your stomach and **small**
intestines help to dissolve your food.

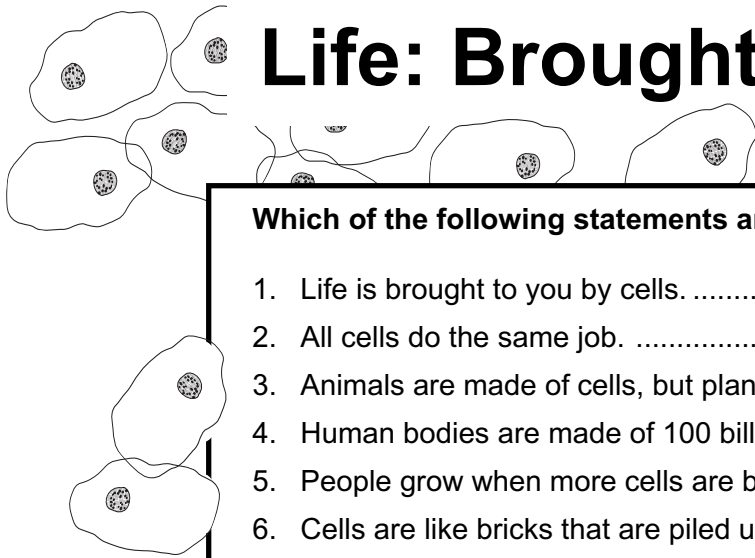
8. The dissolved molecules of food and nutrients are taken to your cells by the **blood**.

9. What else, besides food, does your blood carry to your cells?
oxygen

10. The oxygen helps the cells burn food to create **energy** in the cells.

11. In what part of the cell is most of the energy created?

12. How are plant cells different from animal cells? **Plant cells have cell**
walls made of cellulose. They provide the plant with a framework
and support.



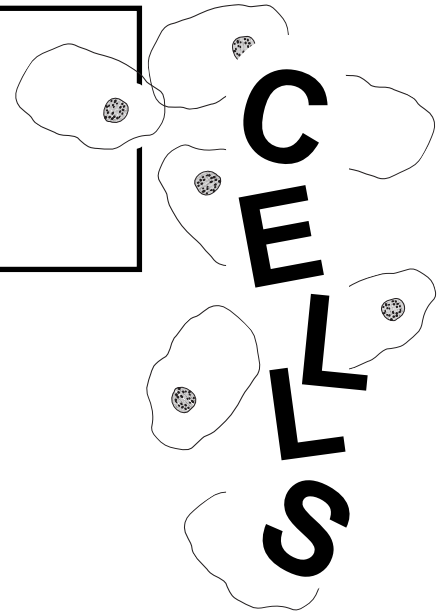
Life: Brought to You by Cells

Which of the following statements are true about cells? Circle your answer.

- | | | |
|--|------|-------|
| 1. Life is brought to you by cells. | True | False |
| 2. All cells do the same job. | True | False |
| 3. Animals are made of cells, but plants are not. | True | False |
| 4. Human bodies are made of 100 billion cells. | True | False |
| 5. People grow when more cells are born than die. | True | False |
| 6. Cells are like bricks that are piled up in structures. | True | False |

Circle the things that are alive:

- | | | |
|------------|----------|--------|
| volcano | family | cake |
| sea sponge | oak tree | acorn |
| fire | grass | pickle |



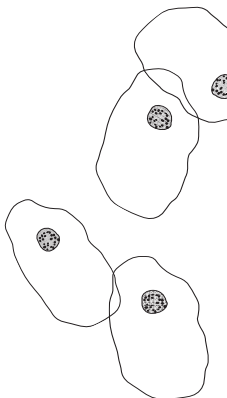
Name four things done by things that are alive:

- 1.
- 2.
- 3.
- 4.

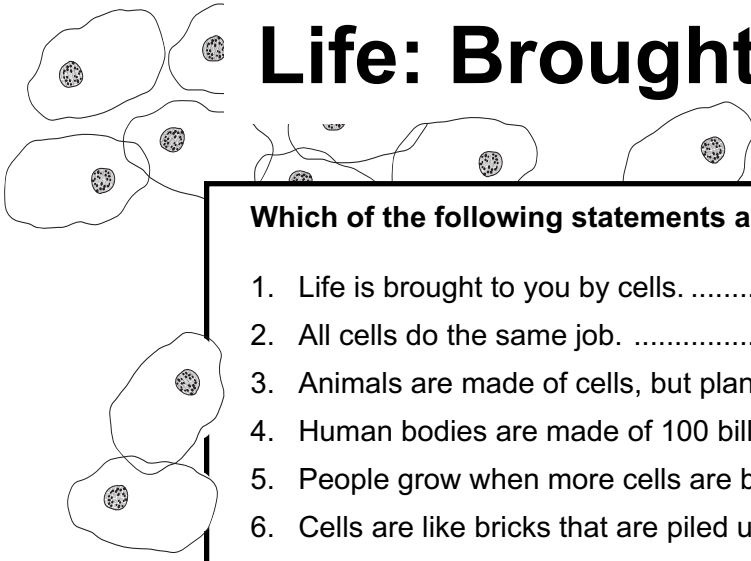
How is a cell like a house?

Which of the following parts are found in both animal and plant cells, and which are only found in plant cells? Circle your answer.

- | | | |
|----------------------------|------------------|-------|
| Nucleus | animal and plant | plant |
| Vacuoles | animal and plant | plant |
| Cell wall | animal and plant | plant |
| Cell membrane | animal and plant | plant |
| Mitochondria | animal and plant | plant |
| Chloroplasts | animal and plant | plant |
| Cytoplasm | animal and plant | plant |



Life: Brought to You by Cells

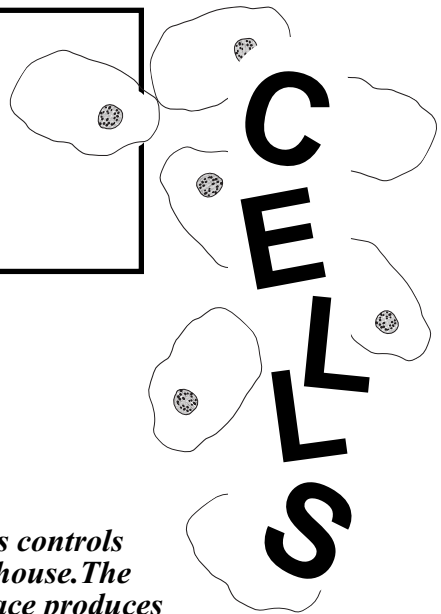


Which of the following statements are true about cells? Circle your answer.

1. Life is brought to you by cells.	<i>True</i>
2. All cells do the same job.	<i>False</i>
3. Animals are made of cells, but plants are not.	<i>False</i>
4. Human bodies are made of 100 billion cells.	<i>False</i>
5. People grow when more cells are born than die.	<i>True</i>
6. Cells are like bricks that are piled up in structures.	<i>True</i>

Circle the things that are alive:

volcano	<i>family</i>	cake
sea sponge	<i>oak tree</i>	acorn
fire	<i>grass</i>	pickle

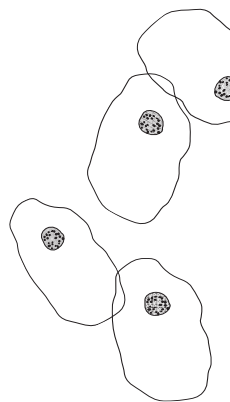


Name four things done by things that are alive:

1. *more*
2. *eat*
3. *drink*
4. *reproduce*

How is a cell like a house?

Inside the cell are different areas that have different jobs. The nucleus controls the work of the cell, just like the desk organizes the paperwork of the house. The mitochondria make energy for the work of the cell, just like the fireplace produces heat for the house.



Which of the following parts are found in both animal and plant cells, and which are only found in plant cells? Circle your answer.

Nucleus	<i>animal and plant</i>
Vacuoles	<i>animal and plant</i>
Cell wall	<i>plant</i>
Cell membrane	<i>animal and plant</i>
Mitochondria	<i>animal and plant</i>
Chloroplasts	<i>plant</i>
Cytoplasm	<i>animal and plant</i>

Sample Family Letter Inviting Family Members to Volunteer

Dear Family Member,

In health class, we have been learning about the cells that make up our bodies. I'd like your help with a lesson I will be teaching soon. I need several adults who can come to school and work with a small group of students. In the small groups, you will be helping the students to conduct simple experiments using hot water. I will need help on:

Date: _____

Time: _____

If you can help, please give me a call at _____. The best time to reach me is _____. I will be glad to explain exactly what is involved in the activities when you call.

Thanks for your help!

Sincerely,

