



# Discussion Guide for

## CELLS: THE BUILDING BLOCKS OF LIFE

### Objectives

Upon watching this program, students will be able to:

- Identify the characteristics that differentiate living matter from non-living matter.
- Explain the difference between eukaryotic and prokaryotic cells. Describe the function of the various major organelles found in plant and animal cells.
- Differentiate between the active transport of materials and the diffusion of materials across the cell membrane.
- Illustrate and explain the basic differences between plant and animal cells.
- Describe why the cell membrane is critical to homeostasis.
- Explain the processes of photosynthesis and cellular respiration.

### About This Program

This program is part of the AIMS Interactive Science Essentials Series. This twenty-four part series covers four subject areas- Earth Science, Biology, Physics, and Chemistry. There are six programs in each subject area. The individual programs are divided into randomly accessible sections. A glossary provides written definitions of terms used in the program, and in most cases will run a section of the video where the word is used in context. A script of the narration is accessible, as well as a bulletin board containing a general introduction to the subject. A quiz allows the student to test their knowledge and the results are recorded for you. In the teacher's section you can view each student's test responses and edit or create your own quiz and test questions.

### Overview

Cells. The Building Blocks of Life is part two of the Biology Essentials series which examines modern day biology. The program begins by introducing cells as the building blocks of life. It also describes the two basic types of cell eukaryotic and prokaryotic. Detailed 3-D animation illustrates the major components of prokaryotic cells including the nucleus, nuclear membrane, golgi bodies, microtubules, microfilaments, and cytoplasm. The importance of the cell membrane in the processes of diffusion, osmosis, and active transport are illustrated. Cellular processes such as respiration, photosynthesis, and reproduction are also discussed.

### Teacher's Preparation

Before the student uses the program set up the computer so that they can easily reach the mouse and the keyboard. Load the CD-ROM into the computer so that it is ready for the student to begin using. While students are able to work at their own pace, some students may benefit from using the program more than once.



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### Suggested Discussion Questions

1. What: are the qualities that distinguish living from non-living matter?
2. What are your thoughts as you contemplate the fact that you as a living organism are made up of atoms and molecules just as inanimate objects such as rocks and ocean water are?
3. Describe all the different specialized cells in the human body and what unique qualities they must have in order to do their job.
4. Why do you think the eggs of birds are so much bigger than those of humans?
5. Describe the forces by which cells became more and more complex and eventually how they came to interact in groups and form complex organisms.
6. Why is it so important for cells to maintain homeostasis?
7. Give examples of situations where diffusion would occur in the non-living environment.
8. What sources of energy other than solar energy could have possibly powered life on Earth? Is there any example of a biome on earth that isn't powered by solar energy?
9. Discuss the relationship between chemistry and biology.
10. Discuss the ramifications of our being able to one day store human beings in suspended animation. Will individuals brought back from suspended animation remember their past life?
11. Can you describe how a cell might look based on the Job it has to perform in the human body?

### Vocabulary

active transport  
 ATP  
 cell  
 chloroplasts  
 cilia  
 coenzymes  
 cytoplasm  
 diffusion  
 DNA  
 endoplasmic reticulum  
 enzymes  
 eukaryote  
 flagella  
 glucose  
 golgi bodies  
 homeostasis  
 lysosomes  
 microtubles  
 mitochondria  
 nucleus  
 photosynthesis  
 prokaryote  
 ribosomes  
 stimuli  
 vacuoles

### Additional Benefits

Students will be able to-

- Describe the role of enzymes and coenzymes in cellular function.
- Explain some of the difficulties encountered in freezing cells for long-term storage.
- Define the term cryobiology.

### Programs Details

#### Length:

22 minutes

#### Subject Areas:

Biology

#### Audience Levels:

Junior-Senior High

#### Order Number:

1-89985G

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