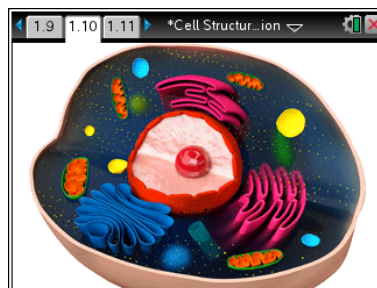




Open the TI-Nspire document *Cell Structure and Function.tns*.

All living things are made of cells. Some organisms, like bacteria or yeast, have only one cell. Other organisms, like you, are multicellular, which means they are made of many cells. In your case, many, MANY cells! Most of your cells have specific functions and a specialized structure. For example, a skin cell is different from a muscle cell or a kidney cell.



Since cells were first discovered by Robert Hooke in 1665, we have learned more about how cells function. Eukaryotic cells, such as yeast, animals and plants, have basic machinery in common that perform the essential tasks for life. In this activity, you will learn about the internal cell structures that support life within both animal and plant cells.

Part 1: Animal Cell

Press **ctrl** **▶** and **ctrl** **◀** to
navigate through the lesson.

Move to pages 1.2 and 1.3.

1. In the first part of this activity, you will explore some of the structures in an animal cell. By clicking on various internal cell structures called *organelles*, you will learn what each structure does for that cell. Read the background information on pages 1.2 and 1.3.

Move to pages 1.4 – 1.8. Answer questions 1-5 here and/or in the .tns file.

Q1. Which of the following is an example of a unicellular organism?

- | | |
|-----------------|----------------|
| A. a maple tree | C. a bacterium |
| B. a dog | D. a mushroom |

Q2. Cells usually have different combinations of organelles, depending on their special function.

- | | |
|----------|-------------|
| A. Agree | B. Disagree |
|----------|-------------|

Q3. What do you think is meant by the term *multicellular* organism?

- | |
|--|
| A. an organism that has lots of cells |
| B. an organism that has one cell |
| C. an organism that is sometimes an animal and sometimes a plant |
| D. an organism with organelles |

Q4. Which cell process is performed by plant cells, but **NOT** by animal cells?

- | | |
|----------------------|--------------------|
| A. Cell division | C. Photosynthesis |
| B. Protein synthesis | D. DNA replication |



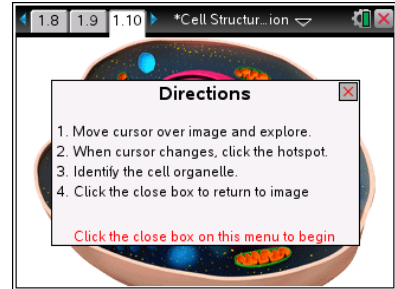
Q5 Big organisms have big cells and little organisms have little cells.

A. Agree

B. Disagree

Move to pages 1.9 and 1.10.

2. Read the instructions on page 1.9 about navigating the animal and plant cell diagrams. On page 1.10, there is a picture of an animal cell. Read the directions in the pop-up box. Close the directions box when you're ready to start exploring the animal cell.



3. Move your cursor over a cell organelle and you will see a magnifying glass icon. Click on the cell organelle and you'll see a name and a description appear. **Take notes below** on the name of the organelle and its function in the space below. Continue to move throughout the cell until you have clicked all of the organelles. Some parts of the cell cannot be clicked on and sometimes there is more than one of the same organelle. When you are ready, move to page 1.11 and answer the questions. Move back to the picture of the cell if you need help answering the questions.

Move to pages 1.11 – 1.18. Answer questions 6-13 here and/or in the .tns file.

Q6. Which organelle did you NOT see in the animal cell?

A. Golgi apparatus

C. Mitochondria

B. Chloroplast

D. Endoplasmic Reticulum

Q7. Mitochondria house important enzymes in the membrane. How is this reflected in the structure of the mitochondria?

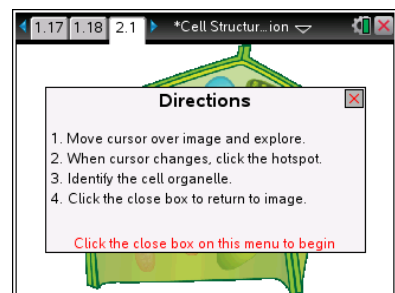
Q8. Some white blood cells (WBC's) are called macrophages. These cells eat bacteria and other disease-causing agents and then destroy them with digestive enzymes. Which organelle do you think macrophages would have in abundance?

- Q9. Why do you think release of the lysozyme enzymes can cause necrosis, death of body tissue?
- Q10. Other WBC's, called B-lymphocytes, make and secrete proteins called antibodies. Which cell organelle would B-lymphocytes have a lot of?
- A. Chloroplasts
B. Ribosomes
C. Lysosomes
D. Smooth ER
- Q11. Prokaryotes, such as bacteria, do not have organelles. What other cell organelle would you predict that prokaryotes would NOT have?
- A. Plasma membrane
B. Ribosomes
C. Nucleolus
D. Cytosol
- Q12. Some cells in your glands secrete chemicals called hormones, which often have to be packaged up before being sent out of the cell. Which organelle would you probably find in great numbers in gland cells?
- A. Lysosomes
B. Golgi apparatus
C. Nuclei
D. Plasma membrane
- Q13. The cell membrane is made of a lipid bilayer, which is a greasy type of molecule. What does this do to the structure of the cell?
- A. It makes the structure flexible.
B. It makes the structure soluble.
C. It makes the structure stiff.
D. It makes the structure porous.

Part 2: Plant Cell

Move to page 2.1.

4. Now you will take a look at a typical plant cell. Follow the same procedure that you did with the animal cell. Click each cell part and **take notes below** on the name of the organelle and its function in the space below. As you work through the plant cell, think about the differences between plant cells and animal cells.





Move to pages 2.2 – 2.9. Answer questions 14-21 here and/or in the .tns file.

Q14. Based on your observations, which of these organelles can ONLY be found in plant cells? Select all that apply.

- | | |
|-----------------|--------------|
| A. Mitochondria | C. Cell wall |
| B. Chloroplasts | D. Rough ER |

Q15. Both Smooth and Rough Endoplasmic Reticulum are responsible for transport. Where do their contents get transported to?

- | | |
|---------------------|---------------------|
| A. Other organelles | C. Outside the cell |
| B. Cell wall | D. Into the air |

Q16. Which organelle contains grana?

- | | |
|--------------|----------------|
| A. Cytoplasm | C. Chloroplast |
| B. Nucleus | D. Vacuole |

Q17. Plants inherit characteristics from their parents just as animals do. Which cell organelle contains the hereditary information?

- | | |
|------------|--------------------|
| A. Vacuole | C. Golgi apparatus |
| B. Nucleus | D. Nucleolus |

Q18. Which pair of plant cell organelles deals with energy processing?

- | | |
|----------------------------------|----------------------------------|
| A. Smooth ER and Rough ER | C. Chloroplasts and Mitochondria |
| B. Golgi apparatus and Smooth ER | D. Nucleolus and Ribosomes |

Q19. Plants have both chloroplasts and mitochondria, which can produce energy. Why does the cell have overlapping functions? Explain.

Q20. The vacuole in plants performs a similar function to which organelle in animals?

- | | |
|--------------------|-------------|
| A. Golgi apparatus | C. Rough ER |
| B. Cytosol | D. Lysosome |

Q21. When a plant is dried for use as rope, which large organelle makes up most of the fibrous cellulose material that remains?

- | | |
|--------------|----------------|
| A. Vacuole | C. Chloroplast |
| B. Cell wall | D. Nucleus |