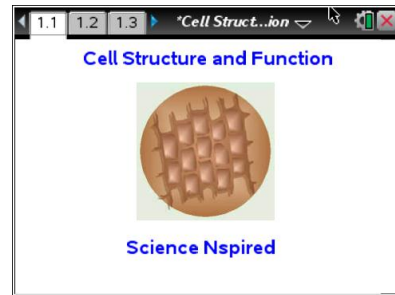




Open the TI-Nspire document *Cell Structure and Function.tns*.

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

Move to pages 1.2 and 1.3. Read the background information below and/or in the .tns file.

In the first part of this activity, you will explore some of the structures in an animal cell. By selecting various internal cell structures called *organelles*, you will learn what each structure does for that cell.

Cells are the structural and functional units of life. **Structure** refers to what something is made of and **function** refers to how things work. All living things have at least one cell.

Organisms like bacteria are made of one cell. A human has trillions of cells. They give a person structure and allows their body to work efficiently.

In this activity, you will learn about some of the parts of animal and plant cells. These parts are **organelles**. Plant and animal cells have most organelles in common. There are some organelles that are contained in either plant OR animal cells.

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
- B. a dog
- C. a bacterium
- D. a mushroom

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

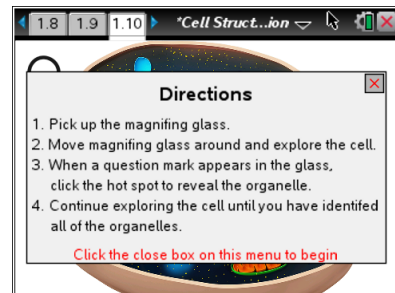
- A. agree
- B. disagree



- 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
 - B. protein synthesis
 - C. photosynthesis
 - D. DNA replication
- Q5. Large organisms have large cells and little organisms have little cells.
- A. agree
 - B. disagree

Move to pages 1.9 and 1.10.

1. Read the instructions on page 1.9 about navigating the cell diagrams.




2. On page 1.10, move your cursor over a cell organelle and you will see a magnifying glass icon. Select 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. Continue to move throughout the cell until you have selected all of the organelles. Some parts of the cell cannot be selected 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.




Tech Tip: To explore the cell diagram, simply tap organelles in the image.



Tech Tip: To access the Directions again, select **menu** or **Document Tools () > Cell Structure and Function > Directions.**



Tech Tip: To access the Directions again, select  > **Cell Structure and Function > Directions.**

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
B. chloroplast
C. mitochondria
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

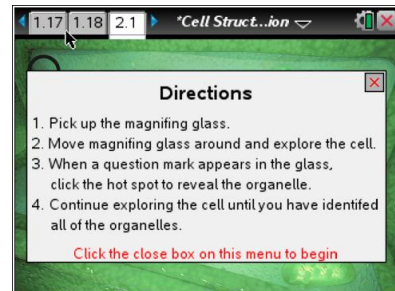
Q13. The cell membrane is made of a lipid bilayer, which is a greasy type of molecule. What does this do to the structure of the cell?

- 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.

3. Now you will take a look at a typical plant cell. Follow the same procedure that you did with the animal cell. Select 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
- B. chloroplasts
- C. cell wall
- D. rough ER

Q15. Both smooth and rough endoplasmic reticulum are responsible for transport. Where do their contents get transported to?

- A. other organelles
- B. cell wall
- C. outside the cell
- D. into the air



Q16. Which organelle contains grana?

- A. cytoplasm
- B. nucleus
- C. chloroplast
- D. vacuole

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

- A. vacuole
- B. nucleus
- C. golgi apparatus
- D. nucleolus

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

- A. smooth ER and rough ER
- B. golgi apparatus and smooth ER
- C. chloroplasts and mitochondria
- 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
- B. cytosol
- C. rough ER
- 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
- B. cell wall
- C. chloroplast
- D. nucleus