Cell-ebrating Life!

SCIENCE NSPIRED

Science Objectives

- Students will explore and learn about the major components of animal and plant cells.
- Students will learn some of the differences between animal cells and plant cells.
- Students will learn the basic functions of animal and plant cell organelles.

Vocabulary

- Organelles
- Unicellular
- Multicellular
- Macrophage
- B-lymphocyte
- Antibody

About the Lesson

- This activity guides students through tours of both animal and plant cells. Models of both types of cells are included in the lesson and both models are interactive for the students. Students can select several cellular organelles and the function of the organelles appears. Following each of the interactive cell models, students are assessed— either in a formative or summative manner—on the organelles.
- As a result, students will:
  - Learn the basic functions of the following animal cell organelles: nucleus, nucleolus, mitochondria, Golgi apparatus, ribosomes, lysosomes, rough endoplasmic reticulum, smooth endoplasmic reticulum, centrioles.
  - Learn the basic functions of the following plant cell organelles: cell wall, nucleus, chloroplasts, mitochondria, vacuole, Golgi apparatus, rough endoplasmic reticulum, smooth endoplasmic reticulum.

TI-Nspire™ Navigator™

- Send out the *Cell-ebrating_Life_MG.tns* file.
- Monitor student progress using Class Capture.
- Use Live Presenter to spotlight student answers.

Activity Materials

- Compatible TI Technologies: TI-Nspire™ CX Handhelds, TI-Nspire™ Apps for iPad®, TI-Nspire™ Software

Tech Tips:

- This activity includes class captures taken from the TI-Nspire CX handheld. It is also appropriate for use with the TI-Nspire family of products including TI-Nspire software and TI-Nspire App. Slight variations to these directions may be required if using other technologies besides the handheld.
- Watch for additional Tech Tips throughout the activity for the specific technology you are using.
- Access free tutorials at http://education.ti.com/calculators/pd/US/Online-Learning/Tutorials

Lesson Files:

Student Activity

- Cell-ebrating_Life!_Student.doc
- Cell-ebrating_Life!_Student.pdf

TI-Nspire document

- Cell-ebrating_Life!_MG.tns

Discussion Points and Possible Answers

Allow students to read the background information on the student activity sheet.

Part 1: Animal Cell

Move to pages 1.2 and 1.3.

1. After opening the document, students should read the background information on pages 1.2 and 1.3. Following those pages, there are several questions that assess the students' background knowledge of cells. These questions would probably be best used for discussion after the students answer them.

Move to pages 1.4 – 1.8.

Have students answer questions 1 - 5 on the handheld, the activity sheet, or both.

Q1. A unicellular organism is made of _____.

Answer: A. one cell that has to do all of the jobs for the organism

Q2. Which of the following is an example of a unicellular organism?

Answer: C. a bacterium

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

Answer: A. an organism that has lots of cells

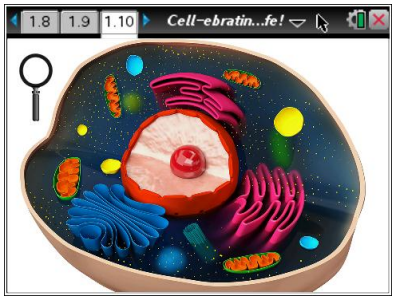
Q4. Which cell process is performed by plant cells, but **NOT** by animal cells?

Answer: C. Photosynthesis

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

Answer: B. Disagree

Move to pages 1.9 and 1.10.



2. Page 1.9 contains some instructions to the student about navigating the animal and plant cell diagrams. As students move to the animal cell diagram on page 1.10, there is an overlying numbered set of instructions. After reading them, the students should close the box of directions by selecting the red "X".

3. Students should explore the animal cell. They should select the different cell parts and take notes on the name of the organelle and its function in the space provided on the student activity sheet. After completing the exploration, they should move to the questions on page 1.11 and beyond. At any time, they may move back to the cell diagram and re-check the organelles.

Tech Tip: To bring up the directions again, students will need to select > **Directions**.

Move to pages 1.11 – 1.17.

Have students answer questions 6 - 12 on the device, the activity sheet, or both.

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

Answer: B. Chloroplast

Q7. Some cells in your body may have hundreds of mitochondria in them. What is one type of cell that would probably need a lot of mitochondria?

Suggested Answers: Muscle cells, nerve cells (neurons), sperm cells

Q8. Name one type of cell that would not need very many mitochondria.

Suggested Answers: Fat cells, skin cells

Q9. Some white blood cells (WBC's) are called macrophages, which mean "big eaters"! These cells engulf bacteria and other disease-causing agents and then destroy them with digestive enzymes. Which organelle do you think macrophages would have in abundance?

Answer: Lysosomes

Q10. Other WBCs, called **B-lymphocytes**, make and secrete proteins called **antibodies**. What cell organelles do B-lymphocytes have a lot of?

Answer: B. Ribosomes

Q11. Bacteria cells do not have a nucleus, so they are known as prokaryotes. What other cell organelle would you predict that prokaryotes would NOT have?

Answer: C. Nucleolus

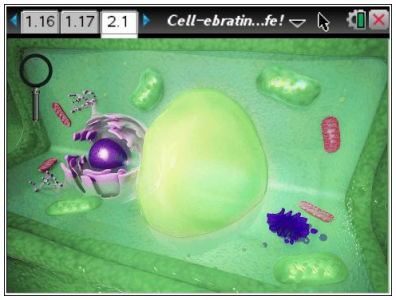
Q12. Some cells in your glands secrete chemicals called hormones, which often have to be packaged up before being sent out of the cell. Which organelle would you probably find in great numbers in gland cells?

Answer: B. Golgi apparatus

Part 2: Plant Cell

Move to page 2.1.

4. After finishing the questions about the animal cell, students should move to Part two, which covers the plant cell. The process will be the same as with the animal cell. Students should select each different cell part and take notes of the name and the function of the organelle in the space provided on the student activity sheet.



Move to pages 2.2 – 2.7.

Have students answer questions 13 - 18 on the device, the activity sheet, or both.

Q13. Which organelle or organelles can only be found in plant cells?

Answer: B. Chloroplasts

Q14. Which organelle surrounds all of the others?

Answer: C. Cell Wall

Q15. Chlorophyll is a green pigment that absorbs sunlight. Most of a cell's chlorophyll can be found inside the _____.

Answer: D. Chloroplasts

Q16. Plants inherit characteristics from their parents just as animals do. Which cell organelle contains the hereditary information?

Answer: B. Nucleus

Q17. Which pair of plant cell organelles deals with energy processing?

Answer: C. Chloroplasts and Mitochondria

Q18. In which part of the plant would you likely find cells that have no chloroplasts? Explain.

Suggested Answer: Roots; they are not exposed to light

TI-Nspire Navigator Opportunities

Choose a student to be a Live Presenter to demonstrate how to negotiate the cell diagrams. The questions in the activity may be distributed as Quick Polls or used as a formative or summative assessment

Wrap Up

When students are finished with the activity, retrieve the .tns file using TI-Nspire Navigator. Save grades to Portfolio. Discuss activity questions using Slide Show.

Assessment

- Formative assessment will consist of questions embedded in the .tns file. The questions will be graded when the .tns file is retrieved. The Slide Show will be utilized to give students immediate feedback on their assessment.