**Lesson Plan 2 - Cytology**

**Grade/Subject:**  **Date:** **CT’s Initials: \_\_\_\_\_\_**

**Number of Students:** **School:**

**Check One**: **Day “Before”** \_\_\_\_\_ **Day “Of”** \_\_\_\_\_ **Day “After”** \_\_\_\_\_

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| --- |
| **Title:** |
| **Lesson Goals** |
| **Central Focus:** cell membranes, cells, cell structure, cytoplasm, making observations, microscopes, organelles, the nucleus  **Standards:**  **Objectives**  Students will be able to… • Observe the basic structure of a human cell • Be able to identify an animal cell by its structure |
| **Knowledge of Students** |
| **Prior Academic Learning and Prerequisite Skills:** See Language below. See the vocabulary below.  What is a cell (see below). What is a cell: online learning from Genetic Science Learning Center [**https://learn.genetics.utah.edu/content/cells/**](https://learn.genetics.utah.edu/content/cells/)  **PBS – Science lesson video’s are available on the PBS Website. Click Chemistry of Live, click “cells”**  [**https://tn.pbslearningmedia.org/resource/39ad5b1c-d00d-4702-9f19-c70dfd646f0e/cell-structure/**](https://tn.pbslearningmedia.org/resource/39ad5b1c-d00d-4702-9f19-c70dfd646f0e/cell-structure/)  **British Society for Cell Biology**  [**https://bscb.org/learning-resources/softcell-e-learning/**](https://bscb.org/learning-resources/softcell-e-learning/)  **Personal/Cultural/Community Assets:**  The Office of Health Careers Programs aim to prepare the next generation of health professionals to serve their communities with empathy and humility. The Office of Health Career Programs administers the Pre-Health Scholars Program, the Pre-Health Application Boot Camp, and the Pre-Matriculation Program.  **Health Career Programs** 910 Madison Ave., Suite 105 Memphis, TN 38163 901.448.8772 [**hcp@uthsc.edu**](mailto:hcp@uthsc.edu) |
| **Supporting Students’ Learning** |
| **Planned Supports:**  **Preconceptions, Common Errors, and Misconceptions:** |
| **Lesson Considerations** |
| **Grouping Strategies:**  **Differentiation:**   * **Modifications:** * **Accommodations:** |
| **Lesson Plan Details:** |
| **Materials:** [**https://www2.mrc-lmb.cam.ac.uk/microscopes4schools/humancheek.php**](https://www2.mrc-lmb.cam.ac.uk/microscopes4schools/humancheek.php)   * **Needed by Teacher:** * **Needed by Students:**   Glass microscope slides  Plastic cover slips  Paper towels or tissue  Methylene Blue solution (0.5% to 1% (mix approximately 1 part stock solution with 4 parts of water) (Available on Amazon)  Plastic pipette or dropper  Sterile, individually packed cotton swabs  **Lesson Introduction “Before”:**  **Learning Activities “During”:**  **Methods**   1. Take a clean cotton swab and gently scrape the inside of your mouth. 2. Smear the cotton swab on the center of the microscope slide for 2 to 3 seconds. 3. Add a drop of methylene blue solution and place a coverslip on top. Concentrated methylene blue is toxic if ingested. Wear gloves and do NOT allow children to handle methylene blue solution or have access to the bottle of solution. 4. Remove any excess solution by allowing a paper towel to touch one side of the coverslip. 5. Place the slide on the microscope, with 4 x or 10 x objective in position and find a cell. Then view at higher magnification.   Human Cheek Cell  **Methylene blue** stains negatively charged molecules in the cell, including DNA and RNA. This dye is toxic when ingested and it causes irritation when in contact with the skin and eyes.  The cells seen are squamous epithelial cells from the outer epithelial layer of the mouth. The small blue dots are **bacteria** from our teeth and mouth.  **Closure “After”:**  **Extension Activity:** |
| **Evidence of Student Learning:** |
| **Formative Assessment:**   * **Objective(s) Being Assessed:** * **Feedback:** * **Modifications/Accommodations:** * **Evidence of Student Understanding:**   **Summative Assessment:**   * **Objective(s) Being Assessed:** * **Feedback:** * **Modifications/Accommodations:** * **Evidence of Student Understanding** |
| **Supporting Literacy Development:** |
| **Language Function:**  **Learning Task:**  **Language Demands:**   * **Vocabulary/Key Phrases: see vocabulary list below**   + **Use Link to hear pronunciations.**     - [**https://www.merriam-webster.com/dictionary/cytology#:~:text=on%20Twitter%20Twitter-,Kids%20Definition,of%20biology%20dealing%20with%20cells**](https://www.merriam-webster.com/dictionary/cytology#:~:text=on%20Twitter%20Twitter-,Kids%20Definition,of%20biology%20dealing%20with%20cells) * **Syntax-see below** * **Discourse-see below**   **Language Supports:** |
| **Use link to examples: www.study.com, enter “cytology”**   * [**https://study.com/academy/lesson/what-is-cytology-definition-history.html**](https://study.com/academy/lesson/what-is-cytology-definition-history.html) * [**https://homework.study.com/explanation/what-is-the-definition-of-cytology-in-biology.html**](https://homework.study.com/explanation/what-is-the-definition-of-cytology-in-biology.html) |
| **NOTE: Attach any Relevant handouts, activities, templates, PPT slides, etc. that are referenced and utilized in this lesson.** |

**VOCABULARY-MERRIAM WEBSTER DICTIONARY**

**Cytology**

## [noun](https://www.merriam-webster.com/dictionary/noun)

cy·​tol·​o·​gy [sī-ˈtä-lə-jē](https://www.merriam-webster.com/dictionary/cytology?pronunciation&lang=en_us&dir=c&file=cytolo01)

**1**

**a**

**:**a branch of biology dealing with the structure, function, multiplication, pathology, and life history of cells **:**[**CELL BIOLOGY**](https://www.merriam-webster.com/dictionary/cell%20biology)

**b**

**:**the cellular aspects of a phenomenon, process, or structure

liver *cytology*

**2**

**:**the microscopic examination of cells obtained from the body (as by aspiration or scraping) for diagnostic purposes **:**

[**EXFOLIATIVE CYTOLOGY**](https://www.merriam-webster.com/dictionary/exfoliative%20cytology)

A Mayo study found that *cytology* is only 40 percent sensitive in detecting bladder cancer among people who have the disease.—Mayo Clinic Health Letter

 called also *cytopathology*

**cytological**

[ˌsīt-ᵊl-ˈäj-i-kəl](https://www.merriam-webster.com/dictionary/cytology?pronunciation&lang=en_us&dir=c&file=cytolo03)

**adjective**

## Word History

In 1665, Robert Hooke coined the term cell to describe the structures he could see in cork with some of the first microscopes. Since then, technology has given us an increasingly complex view of the basic unit of life.

**Etymology**

International Scientific Vocabulary

**First Known Use**

1857, in the meaning defined at [sense 1a](https://www.merriam-webster.com/dictionary/cytology#h1)

**Time Traveler**

**The first known use of cytology was in 1857**

[See more words from the same year](https://www.merriam-webster.com/time-traveler/1857?src=defrecirc-timetraveler-etycard)

**SYNTAX/DISCOURSE**

Your pap smear reveals a quite normal cytology.—Pat Myers, Washington Post, 3 Nov. 2022.

The test process begins with an at-home kit that includes two small cytology brushes, which are used to collect cheek cells from inside the dog’s mouth.—Emilie Le Beau Lucchesi, Discover Magazine, 21 Feb. 2022.

Diagnostic cytology is the science of interpretation of cells that are either exfoliated (be shed from a surface) from epithelial surfaces or removed from various tissues. George N Papanicolou introduced cytology as a tool to detect cancer and pre-cancer in 1928.

Epithelial tissue or epithelium forms the outer covering of the skin and also lines the body cavity. It forms the lining of the respiratory, digestive, reproductive and excretory tracts.

**Career info**: The practice of diagnostic cytology needs proper training of the laboratory personnel including cytopathologist, cytotechnologist and cytotechnician. The role of cytotechnician is very important in cancer control programmes where large numbers of asymptomatic population have to be screened.