

**CODE/MOE/UOIT Makerspaces Project**

**Lesson Plan – Grade 8 Science and Visual Arts: Cells**

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| **BIG IDEAS:**  Cells are the basis of life. Cells organize into tissues, tissues into organs, organs into organ systems,  and organ systems into organisms. Cell systems are interdependent.  **Lesson Objective: Understanding the structure and function of a plant or animal cell.**  **Curriculum Expectations:**  **Science and Technology**  Overall Expectations:  Science - demonstrate an understanding of the basic structure and function of plant and animal cells and cell processes  **Visual Arts** - apply the creative process to produce art works in a variety of traditional two- and three-dimensional forms, as well as multimedia art works, that communicate feelings, ideas, and understandings, using elements, principles, and techniques of visual arts as well as current media technologies  **Science and Technology**  Specific Expectations:   * 1. - Demonstrate an understanding of the postulates of the cell theory   3.2 - Identify structures and organelles in cells, including the nucleus, cell membrane, cell wall, chloroplasts, vacuole, mitochondria, and cytoplasm, and explain the basic functions of each   * 1. - Compare the structure and function of plant and animal cells   **Visual Arts**  Specific Expectations:   * Create art works, using a variety of traditional forms and current media technologies, that express feelings, ideas, and issues, and that demonstrate an awareness of multiple points of view * Use elements of design in artworks to communicate ideas, messages, and understandings for a specific audience and purpose * Use a variety of materials, tools, and techniques to respond to design challenges: □ drawing □ mixed media □ painting □ printmaking □ sculpture □ technology | |
| **Learning Goals:**  “We are learning to…”  Construct models of a system. | **Success Criteria:**  “We will be successful when…”  My model resembles a plant or animal cell and all the appropriate parts are identifiable. |
| **Lesson Overview:**  After learning about the different organelle in plant and animal cells, student will create their own model of a cell using materials of their choice. | |
| **Materials and Technology:**  Materials of student’s choice.  These materials could include:   * paper and paint * cake mix and candy * various sizes of Styrofoam (ex. balls) * computer software | |
| **Student Accommodations/Modifications:**  Could limit the number of organelle that need to be represented. | **Lesson will be differentiated by:**   * **Content, specifically:** * **Process, specifically:** * **Product, specifically:** * **Environment, specifically:** |
| **MINDS ON: Getting Started** | |
| During this phase, the teacher may:  • activate students’ prior knowledge;  • engage students by posing thought-provoking questions;  • gather diagnostic and/or formative assessment data through observation and questioning;  • discuss and clarify the task(s). | During this phase, students may:  • participate in discussions;  • propose strategies;  • question the teacher and their classmates;  • make connections to and reflect on prior learning. |
| Describe how you will introduce the learning activity to your students. What key questions will you ask? How will you gather diagnostic or formative data about the students’ current levels of understanding? How will students be grouped? How will materials be distributed?  Introduce the cell theory and discuss how cells can be different. Introduce the different organelle including their appearance and function. This might be best done through a microscope lab where students look at plant and animal cells. | |
| **ACTION: Working on it** | |
| During this phase, the teacher may:  • ask probing questions;  • clarify misconceptions, as needed, by redirecting students through questioning;  • answer students’ questions (but avoid providing a solution to the problem);  • observe and assess;  • encourage students to represent their thinking concretely and/or pictorially;  • encourage students to clarify ideas and to pose questions to other students. | During this phase, students may:  • represent their thinking (using numbers, pictures, words, manipulatives, actions, etc.);  • participate actively in whole group, small group, or independent settings;  • explain their thinking to the teacher and their classmates;  • explore and develop strategies and concepts. |
| Describe the task(s) in which your students will be engaged. What misconceptions or difficulties do you think they might experience? How will they demonstrate their understanding of the concept? How will you gather your assessment data (e.g., checklist, anecdotal records)? What extension activities will you provide?  Present the task to the students. They are to represent a plant or animal cell in a creative way. However they must show the cell’s organelle and identify them in some way.  Student should at this point understand that a cell is a 3 dimensional object and that the different parts can be represented using various materials.  [Assignment Page and Rubric](https://drive.google.com/a/rscloud.ca/file/d/0B-4BEYPYIQmkZjlfMWVVSzlNejQ/view?usp=sharing)  Extensions:   1. Students could wire their cell so that if someone pushes a button the organelle lights up. 2. Using specialized equipment like Makey Makey, students could wire their cell so that when a button is pushed a computer gives more information about an organelle or reads off information about an organelle. | |
| **CONSOLIDATION: Reflecting and Connecting** | |
| During this phase, the teacher may:  • bring students back together to share and analyse strategies;  • encourage students to explain a variety of learning strategies;  • ask students to defend their procedures and justify their answers;  • clarify misunderstandings;  • relate strategies and solutions to similar types of problems in order to help students generalize concepts;  • summarize the discussion and emphasize key points or concepts. | During this phase, students may:  • share their findings;  • use a variety of concrete, pictorial, and numerical representations to demonstrate their understandings;  • justify and explain their thinking;  • reflect on their learning. |
| How will you select the individual students or groups of students who are to share their work with the class (i.e., to demonstrate a variety of strategies, to show different types of representations, to illustrate a key concept)? What key questions will you ask during the debriefing?  After completion students could be quizzed on the different organelle and their functions. Also they could compare and contrast with the opposite cell from another student. Final products could also be assessed using a checklist or rubric. | |