

<b>Teacher Candidate:</b> <span style="color: red;">Evangelin Milonas</span>	<b>Date:</b> <span style="color: red;">Oct 9, 2024</span>
<b>Grade Level(s):</b> <span style="color: red;">8</span>	<b>Subject/Strand:</b> <span style="color: red;">Science</span>
<b>Lesson Title:</b> <span style="color: red;">Cell Structure &amp; Organelles</span>	<b>Unit of Study:</b> <span style="color: red;">Life Systems - Cells</span>
<b>Lesson Overview:</b> <span style="color: red;">Students will look at the structure of a plant and animal cell. We will look at similarities and differences between the organelles embedded within.</span>	

### PART 1: PREPARING THE LESSON

<p><b>Ontario Curriculum Overall Expectations:</b>  <span style="color: red;">Which overall expectation(s) will be addressed in this lesson? If you are teaching a combined grade classroom, you must include the expectations from each grade. Copy the entire text and the reference codes from the curriculum document.</span></p> <p>B2. Exploring and understanding concepts demonstrate an understanding of the basic structure and function of plant and animal cells and cell processes</p>	<p><b>Ontario Curriculum Specific Expectations:</b>  <span style="color: red;">Which specific expectations will be addressed in this lesson? Specific expectations are always linked to the overall expectation(s). If you are teaching a combined grade classroom, you must include the expectations from each grade. Copy both the entire text and the reference codes from the curriculum document.</span></p> <p>B2.2 identify organelles and other cell components, including the nucleus, cell membrane, cell wall, chloroplasts, vacuole, mitochondria, and cytoplasm, and explain their basic functions</p> <p>B2.3 compare the structure and function of plant and animal cells</p>
<p><b>Big Idea/Enduring Understanding:</b> <span style="color: red;">What is the big idea or enduring understanding that the students will understand and leave the lesson with?</span>          Cells make up our bodies and are regulated by their internal parts (organelles) to keep them functioning properly.          Animal and plant cells operate in similar ways but have few differences to carry out certain needs.</p>	
<p><b>Essential/Key Question(s)</b> <span style="color: red;">that drive the lesson and support curriculum expectations.</span>  <i>What are the essential parts of a cell that are needed for it to function properly? What do they do?</i>  <i>What are some similarities and differences between animal and plant cells?</i></p>	
<p><b>Student Learning Goal(s):</b> <span style="color: red;">What do you want students to know and be able to do by the end of this lesson? The learning goal should be written in student friendly and age appropriate language. (e.g., "We are learning to...")</span>          We are learning to...</p>	

- Identify the organelles and parts of the cell that play an important role in how the cell works
- Find similarities and differences between the animal cell and plant cell

**Student Success Criteria:** How will students know that they are successful in meeting the learning goal(s)? Success criteria should be co-created with the students and linked to the learning goal for the lesson. (e.g., “I can...”, “We are able to...”)

I can...

- Identify 5 organelles from the animal cell and describe their role in how the cell functions.
- Identify 7 organelles from the plant cell and describe their role in how the cell functions
- Find 5 similarities and 2 differences between the animal cell and plant cell

**Learning Skills and Work Habits:** Check any that apply to this specific lesson. Learning skills and work habits is one area that is assessed and evaluated for reporting purposes and is included in both Progress Reports and Report Cards. You will find more information and a description of each on pages 9-12 in the Ontario [Growing Success Policy Document](#).

- Responsibility
- Organization
- Independent Work

- Collaboration
- Initiative
- Self-Regulation

**Necessary Prior Knowledge, Skills, and/or Previous Lesson:** What must students first now and/or be able to do to be successful with this new learning? How does this lesson fit in with previous lessons on this topic?

Students have studied the cell theory and know that there are two types of cells that we are reviewing: Plant and animal cells

We have studied microscopes, they know the parts and have reviewed lab safety (must go more in depth).

**New Vocabulary:** What new/essential vocabulary will be introduced or emphasized during this lesson? How will you do this?

They are receiving a vocabulary sheet at the beginning of class with the following words and their definitions. I will go through it with them as I open the virtual lab on my laptop and project the parts of a cell onto the board.

- Cell membrane – a double-layered membrane that surrounds the cell. Also called the *plasma membrane*, it regulates what enters and leaves the cell.
- Cell wall – the rigid, porous outer layer of a plant cell.
- Chloroplast – an organelle that converts the radiant energy of the Sun into chemical energy through the process of photosynthesis.
- Cytoplasm – everything between the nuclear membrane and the cell membrane.
  - The cytoplasm includes a jelly-like substance called *cytosol* along with all of the organelles, molecules, and other structures found in this region.
- Mitochondria – organelles that, using oxygen, convert nutrients into energy that can be used by the cell.
- Nucleus – a round body in the cell that contains DNA and regulates gene expression.
- Organelle – a cell structure that performs a specific function.

- Vacuole – a type of vesicle that stores water, nutrients, and other chemicals. The large vacuole found in plant cells helps the cells maintain their shape.

**Inclusive Design Considerations:** **are related to Equity/Diversity/Indigenous Perspectives/Culturally Relevant Resources and Pedagogy.** Ask yourself the following questions as you plan your lesson and after you are finished to ensure you have considered questions such as:

- ~~How will this lesson reflect the value that ALL children can learn?~~

All children can learn from this lesson because they are able to investigate the cell and its parts. I will provide them with vocabulary words, descriptions, images, and I will demonstrate the virtual lab with them as I project it on the board. Students will have the chance to look at important organelles: what they look like and how they function. I have posted the slides online as well as given them a paper copy to fill out information regarding organelles. They will be looking at an image of both types of cells side by side and will have a chance to see what looks similar yet different about them.

- Good for all students

- How will culturally responsive teaching be represented in the lesson? How will you acknowledge and honour varied experiences and perspectives?

I will start off the lesson with asking students about the important organs that our human body needs in order to function properly. We will brainstorm as I write it on the board. I will transition into cells and organelles acting similarly to organs in that way.

- How will the lesson ensure that there are equitable learning opportunities (i.e., technology, resources, time, etc.)?

Students have the opportunity to either type or write out their response or use the slide deck/document to respond to the work. During the action portion the students will be watching the board as I enter a virtual lab looking at cells. We will explore the organelles of interest and discuss what they do/why they are important. Plenty of technology is used for this lesson. They will also be filling out a Google form at the end for their consolidation piece. Plenty of time will be given to students in order to complete the assignments.

- What do I know about my students' lives and how can I connect their lives to this topic and learning?

I know that some of my students are super excited to use the microscopes in the lab and will get the chance to do so once we go over the parts of a cell and see how tissue is formed. This is the beginning of their learning journey in cell science and it is an exciting time!

- Are there current events or issues I can connect this topic to?

Please refer to related coursework and the Elements of Differentiated and Inclusive Instruction list found [here](#)

I can relate the importance of cells to diseases that may arise if cells aren't performing at an optimal level; may not be mentioned during this lesson but will be in the future.

**Learning Environment Considerations:**

- Safety Concerns and Precautions:** What needs to be considered to ensure that the learning environment supports the learning goal and ensures safety for all (i.e., special room arrangement, special equipment, safety features, school board health and safety guidelines, etc)?

Students will be sitting at their desks during this lesson and completing the worksheets + interactive slide deck. They will be sitting in their table groups, expected to work independently. They may discuss with someone sitting next to them once they have finished checking off parts of the cell in the minds on portion before we go over it as a class. Students are more than welcome to check off the similarities/differences on the board.

- Materials/Resources/Classroom Arrangement/Necessary Preparation:** How will the classroom set up support student learning in this lesson? What resources are required to have ready for use in the classroom (i.e., consumables, materials, books, technology, etc.)? What do you need to prepare ahead of time so that the lesson will proceed smoothly?

I mentioned the classroom set up above. The resources that are required for this lesson includes my laptop, my adapter, the projector, the Chromebooks, and worksheets for the students to complete the minds on + action portion.

I will post the Google form on Google classroom.

**Resources:** What resources did you use to develop this lesson (e.g., people, teacher prepared resources, textbook, etc.)? Include any teacher professional resources, worksheets you have borrowed or created, with credit reference) to ensure academic integrity.

The resources that are required for this lesson includes my laptop, my adapter, the projector, the Chromebooks, and worksheets for the plant and animal cell. \*\*I will also have the slide deck up in case the printout is not as detailed as the slides

\*\*Some worksheets from AT

\*\*Gizmos Cells Structure lab (worksheet and vocabulary words)

**ASSESSMENT:** You will indicate one type of assessment for each lesson. The main purpose of assessment is to improve student learning and is seen as both assessment **for** and assessment **as** learning. For more information, refer to pages 28-35 in [Growing Success](#) or your *Planning for Student Learning (ETFO)* resource.

- Assessment FOR Learning** *can occur before instruction begins (sometimes known as diagnostic) guiding teacher decisions about what is needed by students; teachers also provide students **ongoing** descriptive feedback and coaching to which students can respond and use to improve prior to assessment of learning. This type of assessment is used to improve learning and guide instruction on a daily basis*
- Assessment AS Learning** *occurs frequently during instruction in a variety of ways, used by teachers AND students. Teachers help students set individual goals, monitor their own progress, become independent learners, and reflect on their thinking and learning. The focus on the feedback is to encourage students to produce their best work by improving on previous work and teach them how to assess their own work through co-created rubrics, success criteria, checklists, exemplars, etc.*
- Assessment OF Learning** *(also known as Summative Assessment), occurs at or near the end of a period of learning, used by the teacher. Evaluation is based on **observations, conversations and student products** and may be in the form of rich performance tasks, demonstration, projects, tests, essays, exams, etc.*

Students will be assessed based on their learning from the lessons (specifically the slide deck) → I have posted screenshots of the organelles in the virtual lab along with their

### Specific Assessment Tool(s):

Consider how you will document (record) evidence of learning. Over time you will want evidence of student learning in different ways (Observations, Conversations, and Products).

- How will the students be assessed? Which type of assessment will you include for this lesson?
- Which category (ies) of the achievement chart will be assessed (i.e., Knowledge and Understanding, Thinking, Communication, Application)?
- What learning skills and work habits will be assessed during this lesson (see above)?
- Which student(s) will be assessed during this lesson?
- When will the assessment occur within the lesson (Before, During or After)?
- How will you record and track your assessment? (refer to your coursework and see pages 69-70 in ETFO Planning for Student Learning for specific assessment tools and strategies)
  - Students will be assessed with assessment of learning. They will fill out a Google Form which will indicate what they know about the organelles of the cell and why they are important
  - thinking will be evaluated along with knowledge
  - all the students will be assessed during this lesson
  - the assessment will occur during the consolidation period
  - I will record and track my assessment on Google Classroom as well as my own personal spreadsheet

purpose.

A Google Form is to be filled out by the end of class which will indicate what they have learned

- They may use their notes to respond

Please refer to related coursework and the Assessment Tools and Strategies list found [here](#)

**DIFFERENTIATED INSTRUCTION:** What instructional, environmental and/or assessment accommodations will help students to be successful? Refer to related coursework and pages 69-70 in your *Planning for Student Learning (ETFO)* resource for a detailed list of accommodations.

**LESSON Accommodations and/or Modifications**

- Content
- Process
- Product

I will demonstrate the task as I verbally instruct the students. I will also post instructions on a slide deck that will be projected at the front of the room. This will aid auditory, reading, and visual learners.

- Worksheets will also reiterate what I am teaching + vocabulary list

**ASSESSMENT Accommodations and/or Modifications:**

What alternative ways will I offer the students to demonstrate their learning and knowledge (e.g., voice recording, drawing, use of assistive technology, use of home language, etc.)

- Content
- Process
- Product \_\_\_\_\_

Students will be given a Google Form to fill out at the end (independently) and may look at their notes if needed.

\*Student has an accommodated assessment to fill out on paper → different questions with visuals

**Student IEP Related Differentiation:** Are there students in the class who have an IEP (Individual Education Plan)? What accommodations are in place for these students? How will you include these in your lesson plan? Are there modified curriculum expectations you need to be aware of and include in your lesson plan for these students?

*Specific students to help:*

I will include accommodations for the assessment (giving the student an exit ticket rather than the Google Form and they may use their notes for help). If needed, I will ask them to explain orally what he believes the answers are by having a conversation with them.

### PART 2: TEACHING THE LESSON (Lesson Design: 3-Part Lesson)



<p><b>Total Length of Period:</b> How long will the entire lesson be? <b>35 min</b></p> <p><b>Estimated Time:</b> for each part of the lesson (Minds On, Action, Consolidation)</p> <p>Minds on 5 min          Action 20 min          Consolidation 10 min</p> <p>The time allotted for each part of the lesson depend a great deal on the age of the students and the specific group of students. It is</p>	<p><b>Instructional Strategy</b>          What strategy, or strategies will you use to best support the learning goal(s) and meet student interest and needs? Consider how you will group students and what types of active learning strategies you will use. Refer to related coursework, <b>PULSE</b>, pages 70 in your <i>Planning for Student Learning (ETFO)</i> resource, as well as the list of</p>	<p><b>Differentiation</b>          See sections above for more detailed info. This column is for you to briefly indicate how you will differentiate the instruction for each section of the lesson.</p>	<p><b>Assessment</b>          See sections above for more detailed info. This column is for you to briefly indicate when and how you will be assessing student learning in this lesson.</p>
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<p>always a good idea to observe the amount of time your AT plans for each part of the lesson and ask for their guidance and support to ensure that the students are engaged and able to pay attention.</p>	<p><b>Instructional Strategies found <a href="#">here</a>.</b></p> <p><b>As you learn about different instructional strategies, try to incorporate them into your lessons for variety and to give you a chance to build a toolkit of strategies that work well for you. It is important to match the instructional strategies to the type of lesson as well as the group of students you are working with.</b></p>	<p><b>Consider:</b></p> <p><input type="checkbox"/> Environmental</p> <p><input checked="" type="checkbox"/> Instructional</p> <p><input checked="" type="checkbox"/> Assessment</p> <p><b>Consider:</b></p> <p><input checked="" type="checkbox"/> Content</p> <p><input checked="" type="checkbox"/> Process</p> <p><input type="checkbox"/> Product</p>	<p><b>Consider:</b></p> <p><input type="checkbox"/> FOR learning?</p> <p><input type="checkbox"/> AS learning?</p> <p><input checked="" type="checkbox"/> OF learning?</p> <p><b>Consider:</b></p> <p><input type="checkbox"/> Conversation</p> <p><input type="checkbox"/> Observation</p> <p><input checked="" type="checkbox"/> Product</p>
<p><b>MINDS ON (Before):</b>            <u>5 minutes</u></p> <ul style="list-style-type: none"> <li>• What is the ‘hook’ to get students curious, engaged and interested in this lesson?</li> <li>• How am I connecting this new learning to students’ prior knowledge and/or experiences (i.e., KWHL)?</li> <li>• What is the student learning goal?</li> <li>• What will the student grouping be for this section of the lesson (e.g., individual, small group, whole group, etc.)?</li> </ul> <p>The hook that will get my students engaged is talking about the human body and the organs that are considered necessities in order for us to function properly. They can share their ideas amongst each other and with the class (I will be writing down their thoughts as they brainstorm) . In a similar way, organelles are needed for a cell to function properly and that is the analogy that I will use to hook them. We have already studied microscopes and cell theory and this is the next step.</p> <p>We are learning to:</p> <ul style="list-style-type: none"> <li>• Identify the organelles and parts of the cell that play an important role in how the cell works</li> <li>• Find similarities and differences between the animal cell and plant cell</li> </ul> <p>The students will complete the activity individually or may discuss quietly with someone next to them if they seem that they don’t have any ideas to brainstorm. We will then regroup as a class and I will write on</p>	<p>The following strategies might be appropriate for the Mind On:</p> <p><input type="checkbox"/> Think/Pair/Share</p> <p><input type="checkbox"/> Four Corners</p> <p><input type="checkbox"/> Quick Write</p> <p><input type="checkbox"/> Number Talk</p> <p><input checked="" type="checkbox"/> Class discussion</p> <p><input type="checkbox"/> ...</p> <p>By discussing as a class and writing down organs on the board it will get students thinking about other organs and not repeat a word that has already been said.</p>	<p><b>Consider:</b></p> <p><input type="checkbox"/> Environmental</p> <p><input type="checkbox"/> Instructional</p> <p><input type="checkbox"/> Assessment</p> <p><b>Consider:</b></p> <p><input type="checkbox"/> Content</p> <p><input type="checkbox"/> Process</p> <p><input type="checkbox"/> Product</p>	<p><b>Consider:</b></p> <p><input type="checkbox"/> FOR learning?</p> <p><input type="checkbox"/> AS learning?</p> <p><input type="checkbox"/> OF learning?</p> <p><b>Consider:</b></p> <p><input type="checkbox"/> Conversation</p> <p><input type="checkbox"/> Observation</p> <p><input type="checkbox"/> Product</p>

their ideas on the board (organs important for our body)			
<p><b>ACTION (During):</b>                    <u>20 minutes</u></p> <ul style="list-style-type: none"> <li>● How will I introduce, explain AND demonstrate new learning/concept/skill? (include explicit details)</li> <li>● What instructional strategies will I use to create an interactive lesson?</li> <li>● How will I provide opportunities for guided practice?</li> <li>● How will I check for understanding?</li> <li>● What opportunities will I provide for descriptive feedback?</li> <li>● I will introduce the activity by showing two cells that are up on the board (plant and animal); I will ask students to indicate - either on paper or on the slide deck - which parts are similar amongst the two, and which parts are different             <ul style="list-style-type: none"> <li>○ They are to use three different coloured pencil crayons to indicate: similarities of what they see in both cells, what they only see in plant cells, and what they only see in animal cells</li> <li>○ This will be taken up as a class</li> </ul> </li> <li>● Students will then look at the vocabulary sheet and I will enter a virtual lab where we will look at each organelle on their list in both the plant and animal cell (we will see how they are similar yet different)             <ul style="list-style-type: none"> <li>○ I may pose questions as to why they think they have different purposes depending on the cell</li> </ul> </li> <li>● Students will then fill out the rest of the worksheet independently             <ul style="list-style-type: none"> <li>○ I will post each organelle's image with its description of purpose in the slide deck so that they can refer back to it and answer the questions for both types of cells</li> </ul> </li> <li>● This lesson is interactive because the students are able to fill out the slide deck and submit it so that I am able to see their progress, or write directly on the worksheets</li> <li>● If time permits, we will take it up at the</li> </ul>	<p>The following strategies might be appropriate for the Action:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Double-Entry Journal</li> <li><input type="checkbox"/> Concept Map</li> <li><input type="checkbox"/> Examine Both Sides</li> <li><input type="checkbox"/> R.A.N. (Reading and Analysing NonFiction Text)</li> <li><input type="checkbox"/> Discussion Web</li> <li><input checked="" type="checkbox"/> Worksheet</li> <li><input checked="" type="checkbox"/> Virtual cell Lab</li> </ul> <p>The strategy that I am using is that these students will activate their learning as I conduct the activity.</p> <p>This will engage them and excite them for actually performing a cell lab in the future to look at cells/tissues of various organisms</p>	<p><b>Consider:</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Environmental</li> <li><input checked="" type="checkbox"/> Instructional</li> <li><input type="checkbox"/> Assessment</li> </ul> <p><b>Consider:</b></p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Content</li> <li><input checked="" type="checkbox"/> Process</li> <li><input type="checkbox"/> Product</li> </ul> <p><b>Instruction is differentiated as I am: demonstrating a virtual lab, providing worksheets with images + written descriptions on the organelles and cells, and offering the opportunity to use the interactive slide deck to show their learning (e.g. checking off the parts of the cells that are similar/different)</b></p>	<p><b>Consider:</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> FOR learning?</li> <li><input type="checkbox"/> AS learning?</li> <li><input type="checkbox"/> OF learning?</li> </ul> <p><b>Consider:</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Conversation</li> <li><input type="checkbox"/> Observation</li> <li><input type="checkbox"/> Product</li> </ul>

<p>end of class</p> <ul style="list-style-type: none"> <li>I will walk around the classroom as they are doing the activity and will offer any guidance as well as check for understanding</li> <li>Descriptive feedback will be provided if students are not seeming to fill in the blanks correctly; I will scaffold them using the visuals and slide deck</li> </ul>			
<p><b>CONSOLIDATION (After):</b> <u>10 minutes</u></p> <ul style="list-style-type: none"> <li>What opportunities will I provide for reinforcement or consolidation of new learning (concept, skill, strategy)?</li> <li>What will we discuss or debrief? Have I scripted a few questions? Do they link back to the Big Idea, Learning Goal and/or Essential Questions?</li> <li>Have I made connections back to the learning goal and success criteria?</li> <li>What will the assigned task be for students to demonstrate understanding or application of learning? Have I communicated the “WILF” (What I’m looking for)?</li> </ul> <p>The students will be filling out a questionnaire Google forms, and this will allow them to show their learning about the various organelles in both plant + animal cells and what their purposes are.</p> <p>The questions in the Google form links back to the big idea, learning goal, success criteria and essential questions.</p>	<p>The following strategies might be appropriate for the Consolidation:</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Exit Pass</li> <li><input type="checkbox"/> Story Mapping</li> <li><input type="checkbox"/> Retell, Relate, Reflect</li> <li><input type="checkbox"/> Say Something</li> <li><input type="checkbox"/> Gallery Walk</li> <li><input type="checkbox"/> Reflection</li> </ul> <p>Students will be filling out a questionnaire on Google forms in order for me to see where they are at with their learning and I will be able to give them a grade.</p>	<p><b>Consider:</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Environmental</li> <li><input type="checkbox"/> Instructional</li> <li><input checked="" type="checkbox"/> Assessment</li> </ul> <p><b>Consider:</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Content</li> <li><input type="checkbox"/> Process</li> <li><input checked="" type="checkbox"/> Product</li> </ul> <p><b>(Student will have their own assessment sheet)</b></p>	<p><b>Consider:</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> FOR learning?</li> <li><input type="checkbox"/> AS learning?</li> <li><input checked="" type="checkbox"/> OF learning?</li> </ul> <p><b>Consider:</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Conversation</li> <li><input type="checkbox"/> Observation</li> <li><input checked="" type="checkbox"/> Product</li> </ul> <p><b>The students will be completing a questionnaire on Google forms.</b></p>
<p><b>Lesson Extension:</b></p> <ul style="list-style-type: none"> <li>Will you assign a task for students to work on to practice what has been taught?</li> <li>How might you provide choice for students?</li> <li>Use extension activities as an opportunity for students to practice what they have learned.</li> <li>Remember to consider the age of students for any work assigned that is to be completed outside of class (no more than 10 minutes per grade per day is the guideline; e.g., Grade 1 = 10 minutes only).</li> </ul> <p>If students have extra time at home, I will ask them to watch this video on plant and animal cells</p>	<p>Consider having students practice using one of the strategies that has been demonstrated during the lesson to consolidate their learning.</p> <p>They can practice their skills by seeing more visual representations of the cells and organelles along with their purpose.</p> <ul style="list-style-type: none"> <li>How do they help the cell function?</li> </ul>	<p>Remember to consider students’ needs for accommodations and modifications for any tasks assigned.</p> <p>Students can add subtitles to the videos if they prefer; slow down the video or even speed it up according to their liking and/if they create a venn diagram as they watch.</p>	<p>Remember that work completed at home cannot be used for assessment, given that it is possible that it has not been completed independently. This is not an assessment; just for practice</p>



<p> Introduction to Cells: The Grand Cell Tour</p> <p>If they would like to further explore the organelles, they are welcome to watch this video.</p> <p> Cell Organelles and Structures Review</p> <p>I would ask them to create a venn diagram of the organelles in both plant/animal cells and keep it in their notebook for a visual reference.</p> <p>**They are kid-friendly and very informational</p>			
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