<table>
<thead>
<tr>
<th>Understanding (s)/goals</th>
<th>Essential Question(s):</th>
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<td>Students will understand:</td>
<td>For the lesson:</td>
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<td>• How to identify 11 structures and organelles of the cell; Cell membrane, Cell wall, Nucleus, Endoplasmic Reticulum, Golgi Apparatus, Lysosome, Mitochondrion, Ribosome, Chloroplast, Vacuole, Centriole, within plant and animal cells. This would fit Bloom’s Cognitive Taxonomy the lowest level of learning Knowledge in the cognitive Domain. The student would have to “know/recall” organelles by remembering simple terminology (Clark 2007).</td>
<td>• Why would we study organelles within a cell? Using this essential question allows the students to recognize and place a value to the organelles that are vital to cellular regulatory processes “value “would fit into the third level of Bloom’s Taxonomy of the Affective Domain The student could explain and justify the organelles as specific components necessary for cell regulation relative to their own body (Clark 2007).</td>
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<td>• How to interpret illustrations of different organelles and conclude that specific structures perform different functions within the cell. The second objective would fit Bloom’s Cognitive Taxonomy third level of learning Application (Clark</td>
<td>• How do we distinguish the differences between plant and animal cells? The second essential question addresses the fourth level of Bloom’s Taxonomy. Affective Domain, Organization and Conceptualization. The student can prioritize the structures of the organelle into specific function therefore identifying particular cell type (Clark</td>
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The student will construct a drawing by applying visual–spatial representations of Howard Gardner’s multiple intelligences the illustration of structure as well as apply knowledge of an organelle function by writing a definition (FUNDERSTANDING 2001).

- How to differentiate plant and animal organelles and structures. Plant cells (chloroplast and cell wall), animal cell (Lysosome and Centriole) and shared structures (Cell membrane, nucleus, Golgi Apparatus, Endoplasmic Reticulum, Mitochondrion, Ribosome, and Vacuole). This would apply to Bloom’s Taxonomy fourth level of Cognitive Learning, Analysis. This is a higher thinking level in which the student will recognize the organization and principles in the identification of plant and animal cells (Clark 2007) (Dabbagh 2002).

Student objectives (outcomes):

**Cognitive**

**All Students would be able to**
- Describe and illustrate one organelle provided in the cooperative learning activity. The students would be able to spell, illustrate their organelle’s structure, and define their organelle’s function. The student has read the handout from the teacher, participated in conversation with group activities, written a definition and spelling, and illustrated information on their organelle in their journal. The student also has the chance to report orally on an aspect of their organelle, receive feedback/corrections from the teacher. As the teacher receives information from the student and students may practice the third Habit of Mind Listening to others- With Understanding and Empathy (Costa& Kallick 2000). The teacher conducts oral pronunciation of organelle and structure name, visual definitions and illustration for the students to record in the in class worksheet. This teaching processes aids those with visual–spatial and verbal-linguistic multiple intelligences studied by Howard Gardner (FUNDERSTANDING 2001). This method of student learning fits the first level of cognitive learning with guided instruction defined by
Most Students would be able to
- Identify a majority of the structures by visual recognition, and define the function of the organelle in the homework assignment. In Bloom’s Cognitive Taxonomy of Learning the student would demonstrate comprehension by spelling and illustrating the structure of the organelle and providing a definition of the function of the cell (Clark 2007).

Some Students would be able to
- Reconstruct and develop abstract relationships in the homework assignment by creating an advertisement for the cell organelles within a particular city’s newspaper. The students would also correctly identify which organelles belong to plant and animal cells, by making up structurally and functional correct illustrations and depictions of the organelles. These students would have achieved a high level outcome of synthesis in Bloom’s taxonomy of Cognitive Learning (Clark 2007). The students would also perform higher order thinking skills and bring personal knowledge and relevance to their homework as founded by Newman’s “Authentic Pedagogy” (Peterson 1997).

Affective

All Students would be able to
- Follow and participate in the in class worksheet. The students will also respond to phenomena by discussion with group members and the teacher. The students will experience receiving new phenomena visually and orally and choose to view and listen to other group’s new organelles. The two responses represent the first and second category of Bloom’s Taxonomy of Affective Domain (Clark 2007).

Most Students would be able to
- The student attaches the correct particular characteristic or selling point to match the function of the organelles newspapers advertisement. Value, the third level of Bloom’s Affective Domain would be demonstrated in the homework assignment (Clark 2007). Componential Intelligence of forming abstract thoughts and processing organelle information effectively is supported by Sternberg’s Triarch Theory of Intelligence (Slavin Student Learning Center 1995).

Some students would be able to
- Modify their view of organelles function as they gather information from their textbook and other resources when constructing the organelle advertisement. The student can look other evidence and revise and add more to their basic concept of organelle function. The student would advertise and highlight the specific plant and animal organelles. Internalizing and applying values is the last step of Bloom’s Taxonomy of the Affective Domain (Clark 2007). Sternberg’s Triarch Theory of Intelligences would address Experiential Intelligence the ability to formulate new ideas and combine unrelated organelle facts and information into a comprehensive
persuasive advertisement (Slavin Student Learning Center 1995).

**Psychomotor**

**All Students would be able to**
- Spell, define, and draw 12 organelles. The students would complete the in-class worksheet by which they would reproduce the correct spelling of the organelle, illustrate the organelle in the plant or animal cell, and define the function of the organelle. The students would reproduce the learned information from the teacher guided instruction in the in-class activity. This would compliment the Imitation and Manipulative levels in Bloom’s psychomotor domain (Clark 2007).

**Most students would be able to**
Spell, draw, and define function with accuracy in the homework organelles assignment. There should be few mistakes as they have already learned and can incorporate the in-class worksheet into the assignment. This level reflects precession in Bloom’s Psychomotor domain (Clark 2007).

**Some students would be able to**
Incorporate and synthesize other domains outside of science into the creation of their newspaper advertisement. Multiple areas of incorporating different environments and subject areas are placed into the assignment and justify the cells function and structure. This applies to the Articulation Stage of Blooms Taxonomy of Psychomotor Domain (Clark 2007).

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### Stage 2 – Assessment Evidence

**Performance Task(s):**
- Group/Teacher Discussion of an Organelle (Notebook Activity) The discussion relates the 9th Habit of Mind; Thinking and Communicating with Clarity and Precession the students will communicate accurately orally and in written form (Costa & Kallick 2000).
- In class homework will be evaluated by a rubric which identifies proper organelle spelling, structure, function and highlighted plant and animal organelles. Gardner’s multiple intelligences of verbal-linguistic (spelling), and visual–spatial representations (drawings) will be emulated within

**Other Evidence:**
- Homework: Create newspaper flyer of the organelles that are for sale within your particular city, by illustration of structure and description of function by using textbook and in-class homework. This is an example of Newman’s authentic pedagogy; the lesson brings relevance of cells into their lives (Peterson 1997).
Learning Activities:

Materials:
White board-markers
12 Descriptive Summaries of Organelles (3 copies of organelle description)
1 Teacher Master Descriptive Summary of Organelles
Power Point Program of Organelles (print out in case computer crashes)
33 Worksheets

Anticipatory Set: (10 Minutes)

Hook: Joke of the Day!
Which cell phone company is preferred by most animal cells?
Answer: Cellular One

Finding Humor is the 14th Habit of Mind presented by Costa and Kallick (Costa & Kallick 2000). Introducing humor into the classroom environment helps physiological bodily functions, such as the secretion of endorphins, decrease in blood pressure, and increase of oxygen in the blood. This also allows student to perceive today’s learning from a light hearted vantage point. It is also noted in chapter four, The Art of the Changing Brain that one of our brains survival mechanisms is to be “Happy” and function in the pleasure system rather than the fear system (Zull 2002). The humor also is supported by Gibson’s
“Accordance Theory” (Linderoth 2002). If the environment of the classroom is safe positive learning and interaction will occur between students and teachers.

Preview: Previous Learning/Setting the Stage
The Teacher will ask, “Which organs in their bodies are important to their well being and why? Remember to keep all answers clean and appropriate.” The teacher will answer one or two students and explain to the class today we are going to learn about organelle structure and function within the cell.

This is a method in which Zull speaks the teacher using inquiry to search for prior and knowledge (Zull 2002). Costa and Kallick also note that we should use the 4th Habit of Mind Thinking Flexibly. If we as teachers can place ourselves into the student’s point of view in this subject area with little or prior knowledge of cells we can orientate the lesson from this viewpoint (Costa & Kallick 2000). This method also rejuvenates cognitive schemata maps that student’s already have about human body and organs. This way the children will open maps and add the new information to their pre-existing schemata. (FUNDERSTANDING 2001).

Body
Transition (3 min) Students will move desks to the right and triple in a group extra students will work in pairs.

Activity: (8 min) Independent Practice
Teacher will pass out 12 descriptive summaries to triplets and pair after groups have arranged desks. Each group will be instructed to read description and record in their notebook spelling of organelles name, describe the function, and sketch drawing of structure.

** Teacher will walk around taking attendance, monitor groups, and answer any questions.**

Teacher will supply key words on the white board
1. Name (spelling)
2. Function (written description)
3. Structure (Sketch)

Transition: Teacher will use frog timer to indicate time is up! (20 seconds)

Activity: (32 Min)
This is an example of Lippman’s, Practice Theory in which the students will interact with the teachers and classmates (Lippman 2008) This also exemplifies Vygostky’s guided practice with the teacher (Morris 2008).
1. Teacher will pass out in-class work sheet and have each student group present their material to the teacher.
2. Each student in the group will verbally supply information to the teacher from their seats. The students will communicate the information in a pre-determined order.
3. The teacher will use a prepared Power Point program to depict the name and correctly pronounce the organelle for class. Teacher will ask class to repeat pronunciation aloud. Next the teacher will display a brief description of function for student to copy. Last the teacher will depict an image of the organelle in respective cell type. The student will have heard the organelles name and definition from the group, the teacher’s pronunciation and class pronunciation this repetition reflects chapter seven in, The Art of the Changing Brain, “10 Ways of Helping People Learn.” Repetition is conducted orally as well as visually through the presentation (Zull 2002).

4. All other groups will write the name and description in the table and a sketch the organelle in each respective cell diagram at top of worksheet.

5. The teacher will indicate that the chloroplast and cell wall are unique to plant cells and ask students to place a star next to these organelles sketch as well as in the table.

6. The teacher will also ask students to star the centriole and lysosome in the animal cell diagram and table.

**Conclusion: Review (2 min)**

The teacher will ask,” Which organelle acts like the brain in human to the class?”

The teacher will depict Gary Larson’s Far Side cartoon on the Power Point. *Finding Humor* is the 14th Habit of Mind presented by Costa and Kallick (Costa & Kallick 2000). Introducing humor into the classroom environment helps physiological bodily functions, such as the secretion of endorphins, decrease in blood pressure, and increase of oxygen in the blood. This also allows student to perceive today’s learning from a light hearted vantage point. It is also noted in The Art of the Changing Brain by Zull that one of our brains survival mechanisms is to be “Happy” and function in the pleasure system rather than the fear system. This will also allow the student to leave the classroom with a sense of accomplishment and good attitude (Zull 2002).
Teacher will remind students to pass forward organelle descriptions, and place notes and worksheet in three ring Biology binder.

The teacher then will pass out homework assignment and indicate that it is due in three days. Students are able to use in-class worksheet notes and textbook diagrams or other resources for structure diagrams for homework.

The homework assignment is designed as a self guided practice designed by Vygostsky (Morris 2008). The homework also allows the student to enter Bloom’s psychomotor domain of articulation, affective domain, of internalization, and cognitive domain of synthesis. The homework is authentic in that the students can work on their strengths in the artistic depictions through visual-spatial intelligences as a teacher this homework exemplifies understanding. (Educational Broadcasting Corporation 2004).

**Transition: (At Bell)**
Teacher will have students leave desks in their place for next hour.

**Accommodations:** Peer tutoring may be used to assist students in groups who have reading comprehension problems. The teacher would make the Power Point slides available a classroom website for all students who have difficulty with written work. This in-class assignment is not due the next day; it will be graded and collected at a specified later date with notebook check.


Organelles are membrane bound structures.

**CYTOPLASM**
Word origin: Gk kyto-, comb. form of kýtos container, receptacle, body + Gk plásma.

**Molecular Soup**

This is the part the cell between the cell membrane and the nucleus. Found in plant and animal cells.

It is not found in the nucleus.

The cytoplasm contains organelles and other structures it is 80% water contains salts clear, and jelly like. It includes everything in the cell membrane.

It contains filaments that aid in the structure of the cytoskeleton (skeleton of the cell).

**CELL MEMBRANE**

Word Origin: Border Patrol
**CYTOPLASM**  
Word origin: Gk kyto-, comb. form of kytos container, receptacle, body + Gk plasm.

**NUCLEUS**  
Word origin: L: kernel, syncopated var. of nuculeus, equiv. to nucu (la) little nut

**ENDOPLASMIC RETICULIUM (ER)**  
Word origin: from the Greek endon, meaning within, plasma, meaning anything formed or moulded, and Latin reticulum, meaning a small net.

**GOLGI APPARATUS, GOLGI COMPLEX, GOLGI APPARATUS (GA)**  
Word origin: From Camillo Golgi Italian physician and scientist.

**LYSOSOME**  
Word origin: from the Greek words lysis, which means dissolution or destruction, and soma, which means body

**MITOCHONDRION (singular) MITOCHONDRIA (plural)**  
Word origin: from Gk. mitos - thread + khondrion - little granule

**RIBOSOME**  
Word origin: from ribonucleic acid and Greek: soma, meaning body.
**CHLOROPLAST**
Word origin: Greek words *chloros* which means green and *plast* which means form or entity.

**VACUOLES**
Word origin: Latin *vacuole*, diminutive form of *vacuum*.