Unit 1: Critical Thinking – Cells Unit Length: 4 Weeks

STEM SCIENCE TECHNOLOGY ENGINEERING MATH	**Science Unit Plan**	
Teacher: Shannon Seigle	Grade: 11th	Course: Biology I
Unit Title: Critical Thinking - Cells		

LEARNING TARGETS

LT 1. I can identify the relationship between chemistry and biology in relation to living systems. (TNSPI 1.3 & 1.4 & 1.5)
LT 2. I can describe the connection between the structure and function of cellular organelles, intercellular relationships, and living systems. (TNSPI 1.1 & 1.2 & 1.7 & 1.8)
LT 3. I can identify the stages of mitosis and the events necessary to maintain living things. (TNSPI 1.6)

UNIT OVERVIEW — **Overall summary of the unit, activities, tasks, and/or content.**

In this unit students will be distinguishing between the main types of cells, their organelle structures and functions, and their importance in the hierarchy of life. Cellular division and reproduction will be addressed in relation to somatic cells. Students will explore the varying ways that materials move through a cell membrane in order to maintain homeostasis. Weaved into this unit, there will be reference to macromolecules, enzymes, and the chemistry of living things. While addressing the science content, students will also critically think by designing and completing various lab investigations in which they will create hypotheses and procedures in order to answer a scientific question or problem. Through the process of critical thinking, students will also perform lab investigations, collect data, analyze data, and explain the relevance of their findings to their hypotheses, scientific error, and explanation of evidence.

MOTIVATORS — **Hooks for the unit and supplemental activities. (PBL scenarios, video clips, websites, literature)**

~ Introduction To Biology HD (https://www.youtube.com/watch?v=7L7x0BAqWis): The Cat In the Hat – Microscopic Organisms (mpg file)

Week	Learning Targets	Materials & Resources	Instructional Procedures	Differentiated Instruction	Assessment
1	LT 1. I can identify the relationship between chemistry and biology in relation to living	Technology: * Apple TV * iPads Video Resources: * Macromolecules (https://www.youtube.com/watch?v=W0tRmShWqO8)	Essential Questions 1. What are the similarities and differences between the four main types of macromolecules in their form and function? 2. How can I determine the macromolecule content of a given substance?	Remediation *Students will work collaboratively with peer tutors. Students will complete any	Exit Slips twice a week Viewed videos along with probing & clarifying

	systems. (TNSPI 1.3 & 1.4 & 1.5)	* Biology 101 Understanding Macromolecule Indicators (https://www.youtube.com/watch?v=aAQpfJhd-w4) * Macromolecule Lab Video (https://www.youtube.com/watch?v=hQb8H5lt77U) * Trailer: Never Let Your Guard Down: The Walking Dead: Season 5 Premiere (https://www.youtube.com/watch?v=P2VCyRga2kk) *Ice Cream Truck Video Clip (https://www.youtube.com/watch?v=8uzQuHsqTXo&list=PLF8F28BD7945DE46E&index=2) * The Cell Online Textbook/As Reference (www.barrington.mysdhc.org) * Crash Course Biology Videos/As Reference (https://www.youtube.com) Apps: * Good Notes and/or Pages * Nova Elements – Play David Pogue's Essential Elements Lab Equipment: http://www.argumentdriveninquiry.com (features student labs and lab proposal templates) Macromolecule Lab (Zombie Apocalypse): • Apron, Goggles, Gloves • Test Tubes • Test Tube Rack • Test Tube Holder • Beakers (various sizes) • Well Plates • Knives • Disposable Plates • Tape & Markers (for labeling) or Wax Pencil • Brown Paper Bag • Glucose Strips and/or Benedict's Solution (in dropper bottle) • Lugol's Solution/KI (in dropper bottle) • Biuret Reagent (in dropper bottle) • Sudan III Solution (in dropper bottle) • Varying food products for testing	Set Food Display – Have 2 trays of common foods displayed on a central table that students encounter when they walk into the room; ask probing questions based on student comments/questions that they pose to each other (some of which will be used later in the macromolecule lab) Teaching Strategies 5E Inquiry – Predominate teaching strategy. Students explore, explain, and elaborate continuously throughout unit. Each subtopic is explored, explained and connected to previous topics. Engage Food Display – Have 2 trays of common foods displayed on a central table that students encounter when they walk into the room; ask probing questions based on student comments/questions that they pose to each other (some of which will be used later in the macromolecule lab) Explore Distribute a picture of a macromolecule to each student. If possible give each student a different molecule or have students work in small groups to identify a molecule. Ask the students/groups to identify the structure and then complete the following inquiry activity: Macromolecule Inquiry Activity – You are what you eat! In this activity students are to create a Good Notes or Pages entry that meets the following criteria: • Picture of the specific macromolecule that was given • The name of the molecule, how they know citing specific evidence • The building blocks of the molecule • Where the molecule is found • Major examples of the type of macromolecule • Indicators used to test for the presence of the macromolecule in foods • Impact the presence and/or lack of the molecule has on humans • A minimum of 3 other essential facts about the molecule Explain Once students/groups are done with their research and Good Notes/Pages entry they will share their findings with the class via the Apple TV	Edmodo homework assignments that were incomplete. Students will resubmit low – quality work per teacher feedback. *Students will log onto their Khan Academy account and watch the appropriate biology video; then students will go to www.sciencegeek.net and take the appropriate quiz (zes); then students submit a "selfie" screen shot of their score to the proper Edmodo assignment tab Enrichment *Students will peer tutor classmates that are struggling to master LTs at the proficient and/or advanced levels. *Students will lead lab groups in collaboratively designing investigations. Learning Styles Kinesthetic Auditory Secretarial Visual Technology-driven	questions are used as formative assessments Lab Report Writings with the following sections: *Title *Statement of the problem *Hypothesis *Materials *Procedure *Results (Data) *Conclusions (Biology Lab Report Template and Rubric) Student-Led Lessons/Lab Investigations Writings on Informational Text from homework

			Explore Video Review – As table groups, have students look up videos of the following categories: • What are macromolecules? • What are macromolecule indicators? • What does a macromolecule lab investigation look like? • What macromolecules are found in varying foods? The groups must watch and decide on a video that they think is of high quality to share with the class. Explain Student groups take turns sharing their high-quality videos. Between each video the instructor asks probing or clarifying questions about the macromolecule content (structure (overall and monomers), examples, functions, characteristics, indicators, lab investigation procedures). Engage Show a clip from The Walking Dead Series & connect it with the Zombie Apocalypse Task in the Macromolecule Lab Extend Macromolecule Lab (Zombie Apocalypse) – This lab is student designed to accomplish the following task: You're a scientist at the Food and Drug Administration's Center for Nutrient Analysis in Atlanta, Georgia. You analyze food based on the label declaration. Tests are performed for proteins, lipids and carbohydrates. Recently, there has been fear of an attack by a new species of undead (similar to a zombie). Scientists believe the only way to combat this attack is by feeding them a substance with high levels of complex carbohydrates and protein, since these macromolecules appear to kill the new species because their cells can't break down the molecules. Scientists have also found that the undead seem to thrive and grow rapidly when fed simple sugars. Interestingly, lipids seem to have little effect. Your team is taking a break from the regular task of food label analysis in order to determine which of your given substances will be the best food to fight off the invasion, based on the tests you will be performing. It is up to you and your team to save Earth! • Students must write a detailed lab proposal, as they may not begin the lab without teacher approval (see the proposal online at www.argumentdriveninquiry.com) • While waiting on their proposal approval students will work on the informational text homework listed below or review macromolecules on NOVA Elements App • With an approved proposal in hand, students begin working on their inquiry lab		

			Engage Show the Ice Cream Truck Video Clip (possibly have samples) Extend Socratic seminar about the informational text - Ice cream sensations graphed on computer, may help to build better tasting food • Student created article questions will be used to direct the seminar (homework); teacher questions optional • Students will run the seminar with a designated monitor Evaluate Macromolecule Lab Report - Resubmission after peer review (use a form based on the lab report rubric) and teacher feedback Summarizing Strategy Students will submit digital scientific notebook journals at the end of the week in order to show their fluidity of thought as a scientist in regard to the essential questions and learning targets (Good Notes or Pages). Students must also answer each of the essential questions for the week and provide evidence for their rationale. Homework Informational Text – Ice cream sensations graphed on computer, may help to build better tasting food http://www.sciencedaily.com/releases/2014/06/140604093553.htm Students will read the article and create 5 critical thinking questions that connect the article to the study of macromolecules. The questions must be open-ended and the student must also provide an advanced answer to each question. ========== Sharing of scientific note-booking with partner (making notes to each other and resubmitting to the original sender & teacher) ========== Finish the Macromolecule Activity – You are what you eat! (use Good Notes) ========== Macromolecule Review Sheet #1 – A worksheet covering classification, examples, and functions of macromolecules ========== Macromolecule Review Sheet #2 – A worksheet covering more examples, structures (final and monomers), and locations of macromolecules ========== Finish the Macromolecule Lab Report (use Good Notes or Pages) ==========		

			Review Macromolecule PowerPoint and complete the accompanying review worksheet - worksheet and PowerPoint covers information studied in this unit and that will be assessed on the summative exam ========== Students should be reviewing on a continuous basis using the NOVA Elements App (Play David Pogue's Essential Elements section) and any other digital resource in order to prepare for class and the macromolecule summative		
2	LT 1. I can identify the relationship between chemistry and biology in relation to living systems. (TNSPI 1.3 & 1.4 & 1.5)	Technology: * Apple TV * iPads Video Resources: * Enzyme Song (https://www.youtube.com/watch?v=deFQhPurj-k) * Enzymes Fun Introduction (https://www.youtube.com/watch?v=XTUm-75-PL4) * Mr. W's Enzyme Song (https://www.youtube.com/watch?v=NdMVRL4oaUo) * Systemic Enzymes for inflammation, heart disease and stroke Video Clip (https://www.youtube.com/watch?v=WxeOxwiVYEI) * The Cell Online Textbook/As Reference (www.barrington.mysdhc.org) * Crash Course Biology Videos/As Reference (https://www.youtube.com) Apps: * Good Notes and/or Pages * Enzymatic (enzyme game/virtual lab) Lab Equipment: http://www.argumentdriveninquiry.com (features student labs and lab proposal templates) Enzymes: How do changes in temperature and pH levels affect enzyme activity? • Apron, Goggles, Gloves • Hot Plate • 600 mL Beakers • 250 mL Erlenmeyer Flask • Hot Plate • 25 mL Graduated Cylinder • Oxygen Gas Sensors • Thermometer/Temperature Probe • pH Paper/pH Probe • Catalase Solution/Liver • 3% H_2O_2	Essential Questions 1. What role do enzymes play in organisms? 2. In what ways can enzymes be altered and how does that affect their functions? Set Food Display –Have cow liver/chicken livers displayed on a central table that students encounter when they walk into the room; ask probing questions based on student comments/questions that they pose to each other (liver will be used later in the enzyme lab) Teaching Strategies 5E Inquiry – Predominate teaching strategy. Students explore, explain, and elaborate continuously throughout unit. Each subtopic is explored, explained and connected to previous topics. Engage Food Display –Have cow liver/chicken livers displayed on a central table that students encounter when they walk into the room; ask probing questions based on student comments/questions that they pose to each other (liver will be used later in the enzyme lab) Explore TV Display: Unlabeled graph (only letters present for each piece) of reaction rates with and without enzymes - http://mandevillehigh.stpsb.org/teachersites/laura_decker/enz_rxn_graphs.htm • Provide students with some Private Think Time to observe and investigate on their iPads • Then, allow students to work with a neighbor to share what they have found out about the graph • Assign a specific letter of the graph to each pair/group and they must identify the name of the part, what it represents, why the graph is important to human survival, and provide evidence for all their information	Remediation *Students will work collaboratively with peer tutors. Students will complete any Edmodo homework assignments that were incomplete. Students will resubmit low – quality work per teacher feedback. *Students will log onto their Khan Academy account and watch the appropriate biology video; then students will go to www.sciencegeek.net and take the appropriate quiz (zes); then students submit a "selfie" screen shot of their score to the proper Edmodo remediation assignment tab Enrichment *Students will peer tutor classmates that are struggling to master LTs at the proficient	Exit Slips twice a week Viewed videos along with probing & clarifying questions are used as formative assessments Lab Report Writings with the following sections: *Title *Statement of the problem *Hypothesis *Materials *Procedure *Results (Data) *Conclusions (Biology Lab Report Template and Rubric) Student-Led Lessons/Lab Investigations Writings on Informational Text from homework

		• 0.1 M HCl • 0.1 M NaOH	Explain Once students/groups are done with their research, they will share their findings with the class via the Apple TV Teacher will ask probing/clarifying questions during the share out in order to fill gaps in information. The questions will be asked in relation to student responses and share out. Engage Show Enzymes Fun Introduction Video Clip Show Enzyme Song Explain Stop the video and ask clarifying questions about the content as it relates to LT1. Whole group discussion/share-out as necessary. Extend Enzymes: How do changes in temperature and pH levels affect enzyme activity? (http://www.argumentdriveninquiry.com) • Students must write a detailed lab proposal, as they may not begin the lab without teacher approval (see the proposal online at www.argumentdriveninquiry.com) • While waiting on their proposal approval students will work on the informational text homework listed below or review enzymes with the Enzymatic App. • With an approved proposal in hand, students begin working on their inquiry lab Engage Show Mr. W's Enzyme Song Post a Got Milk? slide up on the screen after the song ends Explain Got Enzymes? Mini-presentation reviewing enzyme function, enzyme denaturation, and enzyme saturation • Students asked about reaction rate graphs again • Students given a visual of enzyme saturation (participate in a class demo using student hands as active sites and empty water bottles as substrates) • Students asked about what the reaction rate graph would look like when it represents enzyme saturation; What is your reasoning? What is your evidence? Explore Students given time to look at previously selected Got Milk? Ads and are asked to explain the ad connections to macromolecules and enzymes (this could be done individually, in pairs, or groups) Students are to document their findings, thoughts, evidence in order to share with the class via the Apple TV	and/or advanced levels. *Students will lead lab groups in collaboratively designing investigations. Learning Styles Kinesthetic Auditory Secretarial Visual Technology-driven	

			Engage Show the Systemic Enzymes for inflammation, heart disease and stroke Video Clip (possibly Hershey bar samples) Extend Socratic seminar about the informational text - Research May Unlock Enzyme's Role in Disease • Student created article questions will be used to direct the seminar (homework); teacher questions optional • Students will run the seminar with a designated monitor Evaluate Enzyme Lab Report - Resubmission after peer review (use a form based on the lab report rubric) and teacher feedback Biochemistry Summative Test (LT1) – multiple choice with justification for proficiency & open response for advanced (student must score proficient before they are eligible for advanced status Summarizing Strategy Students will submit digital scientific notebook journals at the end of the week in order to show their fluidity of thought as a scientist in regard to the essential questions and learning targets (Good Notes or Pages). Students must also answer each of the essential questions for the week and provide evidence for their rationale. Homework Informational Text – Research May Unlock Enzyme's Role in Disease http://www.sciencedaily.com/releases/2014/01/140102165713.htm Students will read the article and create 5 critical thinking questions that connect the article to the study of enzymes. The questions must be open-ended and the student must also provide an advanced answer to each question. ========== Sharing of scientific note-booking with partner (making notes to each other and resubmitting to the original sender & teacher) ========== Finish the Enzyme Lab Report (use Good Notes or Pages) ========== Review Enzyme PowerPoint and complete the accompanying review worksheet - worksheet and PowerPoint covers information studied in this unit and that will be assessed on the summative exam ==========		

			Students should be reviewing on a continuous basis using the Enzymatic App and any other digital resource in order to prepare for class and the LT1 Biochemistry summative exam		
3	LT 2. I can describe the connection between the structure and function of cellular organelles, intercellular relationships, and living systems. (TNSPI 1.1 & 1.2 & 1.7 & 1.8)	Technology: * Apple TV * iPads * MoticamX * Digital Microscope (max 150X) Video Resources: * Introduction to Cells Video Clip (https://www.youtube.com/watch?v=gFuEo2ccTPA) * Parts of the Microscope Song (https://www.youtube.com/watch?v=Swcz_TJMz0I) * Cells Alive (www.cellsalive.com)/As Reference * Buzzle/Cells (www.buzzle.com)/As Reference * Mr. W's The Cell Song (https://www.youtube.com/watch?v=rABKB5aS2Zg) * Science Geek Biology Resources (http://www.sciencegeek.net/Biology/index.shtml) * How analogies shape our thoughts (https://www.youtube.com/watch?v=o_wAtQm4bNI) * Cell Analogies: The Hunger Games (https://www.youtube.com/watch?v=Xo9L2FB7aDo) * The Simpson Cell Analogy (https://www.youtube.com/watch?v=gT-yNKL5_E0) * PhET Interactive Simulations – Membrane Channels (http://phet.colorado.edu/en/simulation/membrane-channels) *Hearing loss reversed in mice (https://www.youtube.com/watch?v=qpR5RnYNQfg&spfreload=10) * The Cell Online Textbook/As Reference (www.barrington.mysdhc.org) * Crash Course Biology Videos/As Reference (https://www.youtube.com) Apps: * Good Notes and/or Pages * Moticam * Cell World * icell * Cell Explorer (cell game/virtual lab) * 3D Cell Stain Lab Equipment: http://www.argumentdriveninquiry.com (features student labs and lab proposal templates) Cell Structure: How should the unknown microscopic	Essential Questions 1. What are the different types of cells and their distinct characteristics? 2. What are the structures and functions of cellular organelles? 3. How do molecules and other particles move through a cell membrane? Set Change room design to have a U-shaped "lecture" area and microscope based lab station area on the perimeter of the room Attach Moticam to 1 microscope in each lab station Teaching Strategies 5E Inquiry – Predominate teaching strategy. Students explore, explain, and elaborate continuously throughout unit. Each subtopic is explored, explained and connected to previous topics. Engage WITW? Mini-presentation reviewing What In The World is magnified in the selected pictures • Students shown a variety of magnified images • Students asked to identify the object that is being magnified (whole group discussion) • Whole class discussion of a variety of student answers Explore Students given time to look again at the magnified images and decide on definite identifications of the objects being magnified. Students must completely explain their reasoning and provide evidence to support their reasoning. Explain Students are to document their magnified image answers, thoughts, and evidence in order to share with the class via the Apple TV Engage Show the Parts of the Microscope Video Clip (song); Display microscope slide of 3 different colored threads on the screen after the song using 150X on the digital microscope Extend Microscopy Basics Lab: What are the parts of the microscope and how is the microscope properly used for investigations? • Sample Lab 1 http://www.google.com/#safe=active&q=microscope+l	Remediation *Students will work collaboratively with peer tutors. Students will complete any Edmodo homework assignments that were incomplete. Students will resubmit low – quality work per teacher feedback. *Students will log onto their Khan Academy account and watch the appropriate biology video; then students will go to www.sciencegeek.net and take the appropriate quiz (zes); then students submit a "selfie" screen shot of their score to the proper Edmodo remediation assignment tab Enrichment *Students will peer tutor classmates that are struggling to master LTs at the proficient and/or advanced levels. *Students will lead lab groups in collaboratively	Exit Slips twice a week Viewed videos along with probing & clarifying questions are used as formative assessments Lab Report Writings with the following sections: *Title *Statement of the problem *Hypothesis *Materials *Procedure *Results (Data) *Conclusions (Biology Lab Report Template and Rubric) Student-Led Lessons/Lab Investigations Writings on Informational Text from homework

		organism be classified? • 2 Known Plant Cell Slides • 2 Known Animal Cell Slides • 1 Unknown Slide (Euglena) • Compound, Light Microscope • Digital Microscope Camera (optional) • Lens Paper • Immersion Oil	ab&surl=1 • Sample Lab 2 http://www.biologycorner.com/worksheets/microscope-advanced.html Engage Show Introduction to Cells Video Clip or Show Mr. W's The Cell Song Explain Stop the video and ask clarifying questions about the content as it relates to LT2. Whole group discussion/share-out as necessary. Explore Cell Structure: How should the unknown microscopic organism be classified? (http://www.argumentdriveninquiry.com) • Students must write a detailed lab proposal, as they may not begin the lab without teacher approval (see the proposal online at www.argumentdriveninquiry.com) • While waiting on their proposal approval students will work on the informational text homework listed below or review cells with the various Cell Apps. • With an approved proposal in hand, students begin working on their inquiry lab Engage Ask students to about analogies (what are they, examples, science-based) Play the following videos: How analogies shape our thoughts, Cell Analogies: The Hunger Games, and The Simpson Cell Analogy Extend Student group will create an analogy video using an inspiration of their choice (STEM school, movie, community, etc.). The video must include analogies (visuals and audio explanations) for all cell structures and all types of cellular transport. Explain Students played their final cell analogy videos for the class. Students were asked to answer any clarifying questions that the audience may have had in relation to their video. Engage Hearing loss reversed in mice Video Clip (possibly have music playing)	designing investigations. Learning Styles Kinesthetic Auditory Secretarial Visual Technology-driven	

			Extend Socratic seminar about the informational text - Sound-sensing cells regenerated in ears of mice with hearing damage • Student created article questions will be used to direct the seminar (homework); teacher questions optional • Students will run the seminar with a designated monitor Evaluate Cell Structure Lab Report - Resubmission after peer review (use a form based on the lab report rubric) and teacher feedback Cell Structure & Function (LT2)– multiple choice with justification for proficiency & open response for advanced (student must score proficient before they are eligible for advanced status) Cell Analogy Video Summarizing Strategy Students will submit digital scientific notebook journals at the end of the week in order to show their fluidity of thought as a scientist in regard to the essential questions and learning targets (Good Notes or Pages). Students must also answer each of the essential questions for the week and provide evidence for their rationale. Homework Informational Text – Sound-sensing cells regenerated in ears of mice with hearing damage http://www.sciencedaily.com/releases/2014/02/140220132156.htm Students will read the article and create 5 critical thinking questions that connect the article to the study of macromolecules. The questions must be open-ended and the student must also provide an advanced answer to each question. ========== Sharing of scientific note-booking with partner (making notes to each other and resubmitting to the original sender & teacher) ========== PhET Interactive Simulations – Membrane Channels ========== Finish the Cell Structure Lab Report (use Good Notes or Pages) ========== Work on cell analogy video ========== Review Cell Structure/Function & Transport PowerPoint and complete the accompanying review worksheet - worksheet and PowerPoint covers information studied in this unit and that will be assessed on the summative exam		

			========== Students should be reviewing on a continuous basis using the Cell Apps and any other digital resource in order to prepare for class and the LT2 Cell summative exam		
4	LT 3. I can identify the stages of mitosis and the events necessary to maintain living things. (TNSPI 1.6)	Technology: * Apple TV * iPads *Moticam Video Resources: * Cure Cancer; Cell Slider (www.cellslider.net) * Twilight Biology Class Video Clip (https://www.youtube.com/watch?v=Vc1UqeHhjeo) * The Stages of Mitosis Video Clip (https://www.youtube.com/watch?v=VGV3fv-uZYI) * A Great Mitosis Video Clip (https://www.youtube.com/watch?v=AhgRhXl7w_g) *Virtual Investigation – Time Spent in the Cell Cycle (http://www.biology.arizona.edu/cell_bio/activities/cell_cycle/cell_cycle.html) *Mitosis/Cell Cycle Lab (http://www.biologyjunction.com/mitosis_activity.htm * How Cells Divide and How Chemotherapy Works (https://www.youtube.com/watch?v=VRhz3DhjG5M) *Lab 9 Cell Cycle Experiments Lab Video (https://www.youtube.com/watch?v=S_3slRZGZVU) * The Cell Online Textbook/As Reference (www.barrington.mysdhc.org) * Crash Course Biology Videos (https://www.youtube.com Apps: * Good Notes and/or Pages * PlantHistology App – Plant Mitosis * AnimalHistology App – Animal Mitosis * Cancer Avenger App – Mitosis, Cancer Treatment/Cure Lab Equipment: http://www.argumentdriveninquiry.com (features student labs and lab proposal templates) Cell Cycle: Do plant and animal cells spend the same proportion of time in each stage of the cell cycle? • Onion Root Tip Slide • Whitefish Blastula Slide • Compound, Light Microscope • Lens Paper	Essential Questions 1. What occurs during each phase of the cell cycle and why? 2. How do somatic cells reproduce? 3. What happens when cell division becomes uncontrolled within a body? Set Have the Twilight Biology Class Video clip displayed and ready to play so that students seen the visual when they walk into class Teaching Strategies 5E Inquiry – Predominate teaching strategy. Students explore, explain, and elaborate continuously throughout unit. Each subtopic is explored, explained and connected to previous topics. Engage As students enter the room, hand them an unlabeled visual of a phase of the cell cycle (interphase, mitosis PMAT, and cytokinesis) Explore After watching the video clip pose the following questions to students: What is the connection between the video clip and the paper visual that you received upon entering the classroom? After taking feedback to the question, each student (or group) must create a GoodNotes or Pages entry that addresses the following information about their visual: • Determine the phase of the cell cycle • Describe what is happening in that phase of the cell cycle • Include visual(s) with all parts labeled • Explain the importance of the phase to living things • A minimum of 3 more facts about the phase • Be prepared to be the "master(s)" of that phase and present the information to the class, and be able to answer questions Explain Once students/groups are done with their research and Good Notes/Pages entry they will share their findings with the class via the Apple TV Engage Show A Great Mitosis Video Clip or the Stages of Mitosis Video	Remediation Students will work collaboratively with peer tutors. Students will complete any Edmodo homework assignments that were incomplete. Students will resubmit low – quality work per teacher feedback. Students will log onto their Khan Academy account and watch the appropriate biology video; then students will go to www.sciencegeek.net and take the appropriate quiz (zes); then students will submit a "selfie" screen shot of their score to the proper Edmodo remediation assignment tab Enrichment Students will peer tutor classmates that are struggling to master LTs at the proficient and/or advanced levels. Students will lead lab groups in collaboratively designing	Exit Slips twice a week Viewed videos along with probing & clarifying questions are used as formative assessments Lab Report Writings with the following sections: *Title *Statement of the problem *Hypothesis *Materials *Procedure *Results (Data) *Conclusions (Biology Lab Report Template and Rubric) Student-Led Lessons/Lab Investigations Writings on Informational Text from homework

		• Immersion Oil	Clip <u>Explain</u> Stop the video and ask clarifying questions about the content as it relates to LT2. Whole group discussion/share-out as necessary. <u>Extend</u> **<u>LT 3 Assessment Assignment</u>** 1. Read the Cell Cycle Adi Lab Revised 2 worksheet. 2. Design and conduct the Cell Cycle Adi Lab in order to answer the guiding question or problem. Use the lab proposal template. 3. Write a formal lab report for the Cell Cycle Adi Lab (use the lab report template and lab report rubric to make sure each section of your lab report meets the requirements; you will see what is required for Advanced, Proficient; please note that turning your work in on time is part of the rubric). 4. After you complete the conclusion of your lab put a Post-Lab Questions Section fully answer the following questions. (In order to score Proficient on this part you must completely answer each question. In order to score Advanced on this part you must completely answer each question and provide high-quality evidence to support your answer.) <u>Post-Lab Questions Section</u>: 1. Why do you think we look at the onion root cell for examples of cells going through the different stages of mitosis? 2. Why does a cell undergo mitosis? 3. When a cell is in *interphase*… a. Is the DNA in the form of chromatin or chromosomes? b. Is the nuclear membrane present? c. In what sub-stage is the DNA replicated? 4. At the end of *prophase*… a. Is the DNA in the form of chromatin or chromosomes? b. Is the nuclear membrane present? 5. At the end of *metaphase*…	investigations. <u>Learning Styles</u> Kinesthetic Auditory Secretarial Visual Technology-driven	

			a. Where is the DNA located in the cell? b. What brought the DNA to this location? c. Where do these objects attach to the DNA? 6. When a cell is in *anaphase*… a. What happens to the DNA? 7. At the end of *telophase*… a. Is the nuclear membrane present? b. Is the DNA in the form of chromatin or chromosomes? 8. When a cell finished *cytokinesis*… a. Is the nuclear membrane present? b. Is the DNA in the form of chromatin or chromosomes? c. How many cells are present? 9. The majority of your cells were in which stage- for your onion slide and for your fish slide? 10. What is the biggest difference you notice between the fish and onion cells. 11. Of the stages of the cell cycle, which one takes the most time to complete? 12. Of the stages of mitosis, which one takes the most time to complete? 13. Which is the shortest stage of mitosis in length? 14. What would happen to the cell and the chromosomes if the process of mitosis skipped metaphase? 15. What would happen if MITOSIS skipped cytokinesis? Malignant tumors are sometimes treated with drugs that halt mitosis, and thus stop the production of new cancer cells. Two such drugs, vincristine sulfate and vinblastine sulfate, interfere with the formation of spindle fibers. 16. How could this action halt mitosis? Support your answer with evidence from your research, videos, and/or note-booking. Write like a scientist! This must be answered in at least a 6-sentence paragraph. <u>Engage/Explain</u> Review stages of the cell cycle using the two Histology Apps (show students that each App also have a review/study guide option) <u>Engage</u> Watch How Cells Divide and How Chemotherapy Works Video Clip		

			Extend Socratic seminar about the informational text - Targeting cells resistant to chemotherapy • Student created article questions will be used to direct the seminar (homework); teacher questions optional • Students will run the seminar with a designated monitor Evaluate LT 3 The Cell Cycle Assessment – Lab Report & Post-Lab Questions Summarizing Strategy Students will submit digital scientific notebook journals at the end of the week in order to show their fluidity of thought as a scientist in regard to the essential questions and learning targets (Good Notes or Pages). Students must also answer each of the essential questions for the week and provide evidence for their rationale. Homework Informational Text – Targeting cells resistant to chemotherapy http://www.sciencedaily.com/releases/2014/04/140424125022.htm Students will read the article and create 5 critical thinking questions that connect the article to the study of macromolecules. The questions must be open-ended and the student must also provide an advanced answer to each question. ========== Sharing of scientific note-booking with partner (making notes to each other and resubmitting to the original sender & teacher) ========== Review Cell Cycle PowerPoint and complete the accompanying review worksheet - worksheet and PowerPoint covers information studied in this unit and that will be assessed on the summative project ========== Students should be reviewing on a continuous basis using the Mitosis/Cell Cycle Apps and any other digital resource in order to prepare for class and the LT3 Cell Cycle summative (lab report and post-lab questions)		