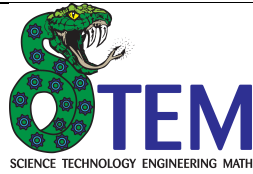


# Unit: Creative Thinking – Heredity

Length: 4 Weeks



## Science Unit 2 Plan

Teacher: Shannon Seigle

Grade: 11th

Course: Biology I

Unit Title: Creative Thinking - Heredity (Biology I: Standard 4)

### LEARNING TARGETS

LT 8. I can identify the structure and function of DNA as well as its replication and role with RNA in synthesizing proteins. (TNSPI 4.1 & 4.2 & 4.3)

LT 9. I can predict the genotype and phenotype of offspring based on mode of inheritance and parental data. (TNSPI 4.4 & 4.5)

LT 10. I can describe how gametes are produced through meiosis and how genetic variation in a population is determined by sexual reproduction (genetic disorders/mutations). (TNSPI 4.6 & 4.7 & 4.8)

LT 11. I can explain bioethical issues related to gene technologies (genetic engineering, cloning, transgenic organism production, stem cell research, DNA fingerprinting). (TNSPI 4.9)

### UNIT OVERVIEW

Overall summary of the unit, activities, tasks, and/or content.

In this unit students will be exposed to heredity and genetics in a manner that tasks their creative thought process. Students will start the unit with an inquiry lab on DNA extraction using strawberries. Throughout the unit students will be asked to make a genetic Cooties game, decode and write secret messages of RNA and DNA, give an “expert” presentation of content including an originally-written song, design genetics word problems including pedigrees, complete dominance, incomplete dominance, codominance, multiple alleles, and sex-linked traits.

### MOTIVATORS

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

Introduction To Genetics ([https://www.youtube.com/watch?v=B\\_PQ8qYtUL0](https://www.youtube.com/watch?v=B_PQ8qYtUL0))

Week	Learning Targets	Materials & Resources	Instructional Procedures	Differentiated Instruction	Assessment
1	LT 8 - I can identify the structure and function of DNA as well as its replication and role with RNA in synthesizing proteins. (TNSPI 4.1 & 4.2 & 4.3)	<p><b>Technology:</b> * Apple TV * iPads</p> <p><b>Video Resources:</b> * DNA Structure and Function (<a href="https://www.youtube.com/watch?v=P_OdWsii7AI">https://www.youtube.com/watch?v=P_OdWsii7AI</a>) *DNA Replication: The Cell’s Extreme Team Sport (<a href="https://www.youtube.com/watch?v=5q_SrmeiWsuc">https://www.youtube.com/watch?v=5q_SrmeiWsuc</a>) *DNA Replication Process [3D</p>	<p><b>Essential Questions</b></p> <ol style="list-style-type: none"> <li>1. What makes up the structure of nucleic acids and what are their major functions?</li> <li>2. How are DNA and RNA replicated in a cell?</li> <li>3. What are the differences and similarities between DNA and RNA structures, functions, and replication?</li> <li>4. What is transcription?</li> <li>5. What is translation?</li> <li>6. How are transcription and translation involved in protein synthesis in a cell?</li> </ol> <p><b>Set</b> Strawberries and Cheeks – Strawberries on display and to eat. Discussion of how strawberries and cheeks are related?</p>	<p><b>Remediation</b> *Students will work collaboratively with peer tutors. Students will complete any Edmodo homework assignments that were incomplete. Students will resubmit low –</p>	<p>Exit Slips twice a week</p> <p>Viewed videos along with probing &amp; clarifying questions are used as formative assessments</p> <p>Lab Report</p>

	<p>Animation]  <a href="https://www.youtube.com/watch?v=27TxKoFU2Nw">https://www.youtube.com/watch?v=27TxKoFU2Nw</a>)  *Why RNA is Just as Cool as DNA  <a href="https://www.youtube.com/watch?v=0Elo-zX1k8M">https://www.youtube.com/watch?v=0Elo-zX1k8M</a>)  *Protein Synthesis and the Lean, Mean Ribosome Machines  <a href="https://www.youtube.com/watch?v=h5mJbP23Buo">https://www.youtube.com/watch?v=h5mJbP23Buo</a>)  *DNA Song  <a href="https://www.youtube.com/watch?v=ckZE5taX4&amp;list=PL2ExA0ZRIBI5ZMMOP7V4LYdFlhQyimSt9&amp;index=3">https://www.youtube.com/watch?v=ckZE5taX4&amp;list=PL2ExA0ZRIBI5ZMMOP7V4LYdFlhQyimSt9&amp;index=3</a>)  *DNA, Fantastic! Mr. W's DNA Rap  <a href="https://www.youtube.com/watch?v=wdhL-T6tQco">https://www.youtube.com/watch?v=wdhL-T6tQco</a>)  *Protein Synthesis!  <a href="https://www.youtube.com/watch?v=JTC18Yh7bSU">https://www.youtube.com/watch?v=JTC18Yh7bSU</a>)  *DNA Replication Rap  <a href="https://www.youtube.com/watch?v=1L8Xb6j7A4w">https://www.youtube.com/watch?v=1L8Xb6j7A4w</a>)  * The Cell Online Textbook/As Reference (<a href="http://www.barrington.mysdhc.org">www.barrington.mysdhc.org</a>)  * Crash Course Biology Videos/As Reference (<a href="https://www.youtube.com">https://www.youtube.com</a>)</p> <p><u>Apps:</u>  * Good Notes and/or Pages</p> <p><u>Lab Equipment:</u></p> <p>DNA Extraction Lab (strawberries &amp; cheek cells):</p> <ul style="list-style-type: none"> <li>• Apron, Goggles, Gloves</li> <li>• Strawberries</li> <li>• DNA Extraction Buffer (soapy, salty water- 100mL plain shampoo or 50mL dish detergent, 15 grams sodium chloride, 1 liter water)</li> <li>• Ziploc bag</li> <li>• 1 test tube</li> <li>• Parafilm</li> <li>• 1 funnel</li> <li>• Paper towel or funnel filter</li> <li>• Coffee stirrer or transfer pipet</li> <li>• Isopropyl Alcohol</li> <li>• Plastic cup</li> <li>• Tweezers</li> <li>• Spoon</li> <li>• Graduated cylinder</li> </ul>	<p><u>Teaching Strategies</u>  5E Inquiry – Predominate teaching strategy. Students explore, explain, and elaborate continuously throughout unit. Each subtopic is explored, explained and connected to previous topics.</p> <p><u>Engage</u>  Strawberries and Cheeks – Strawberries on display and to eat. Discussion of how strawberries and cheeks are related?  Play DNA Song (pause and ask questions as necessary)</p> <p><u>Explore</u>  DNA Extraction Lab: Is it possible to observe extracted DNA from a strawberry using simple lab procedures?</p> <p>Students must write a detailed lab proposal, as they may not begin the lab without teacher approval (see the proposal online at <a href="http://www.argumentdriveninquiry.com">www.argumentdriveninquiry.com</a>)</p> <ul style="list-style-type: none"> <li>• While waiting on their proposal approval students will work on the informational text homework listed below or review genetics with the Genetics 101.</li> <li>• With an approved proposal in hand, students begin working on their inquiry lab.</li> </ul> <p><u>Explain</u>  Students will discuss their finding with other lab groups in an informal, whole class “Incubator” Session.</p> <p><u>Engage</u>  TV Display: A message that is in DNA Code</p> <p><u>Explore</u>  Secret Messages: (<a href="http://www.mrsec.psu.edu/education/nano-activities/dna/dnas_secret_code/dnas_secret_code.pdf">http://www.mrsec.psu.edu/education/nano-activities/dna/dnas_secret_code/dnas_secret_code.pdf</a>)</p> <ul style="list-style-type: none"> <li>• Provide students with some Private Think Time to observe and investigate on their iPads</li> <li>• Then, allow students to work with a neighbor to share what they have found out about the code</li> <li>• Provide groups with other messages to decode</li> <li>• Each group must write a secret message to another group in the class, who then must decode the message</li> </ul> <p><u>Explain</u>  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.</p> <ul style="list-style-type: none"> <li>• DNA Structure and Function Video and/or</li> <li>• DNA Replication: The Cell’s Extreme Team Sport Video</li> </ul> <p>“Incubator” Session as necessary</p> <p><u>Engage</u>  TV Display: A message that is in RNA Code (uracil instead of thymine)</p>	<p>quality work per teacher feedback.</p> <p>*Students will log onto their Khan Academy account and watch the appropriate biology video; then students will go to <a href="http://www.sciencegeek.net">www.sciencegeek.net</a> and take the appropriate quiz (zes); then students submit a “selfie” screen shot of their score to the proper Edmodo assignment tab</p> <p><u>Enrichment</u>  *Students will peer tutor classmates that are struggling to master LTs at the proficient and/or advanced levels.</p> <p>*Students will lead lab groups in collaboratively designing investigations.</p> <p><u>Learning Styles</u>  Kinesthetic  Auditory  Secretarial  Visual  Technology-driven</p>	<p>Writings with the following sections:  *Title  *Statement of the problem  *Hypothesis  *Materials  *Procedure  *Results (Data)  *Conclusions (Biology Lab Report Template and Rubric)</p> <p>Student-Led Lessons/Lab Investigations</p> <p>Writings on Informational Text from homework</p> <p>“Incubator” Sessions after major content studies and/or after finding student misconceptions through previous formative assessments. (Student-led or teacher-led seminar)</p>
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		<ul style="list-style-type: none"> <li>• Electronic scale</li> <li>• Glass stirring rod</li> </ul>	<p><u>Explore</u>  Say It with DNA:  (<a href="http://images.pcmac.org/SiSFiles/Schools/GA/GwinnettCounty/CentralGwinnett/Uploads/Forms/Say%20it%20with%20DNA.pdf">http://images.pcmac.org/SiSFiles/Schools/GA/GwinnettCounty/CentralGwinnett/Uploads/Forms/Say%20it%20with%20DNA.pdf</a>)</p> <ul style="list-style-type: none"> <li>• Provide students with some Private Think Time to observe and investigate on their iPads</li> <li>• Then, allow students to work with a neighbor to share what they have found out about the code</li> <li>• Provide groups with other messages to decode</li> <li>• Each group must write a secret message to another group in the class, who then must decode the message</li> </ul> <p><u>Explain</u>  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.</p> <ul style="list-style-type: none"> <li>• Why RNA is Just as Cool as DNA and/or</li> <li>• Protein Synthesis and the Lean, Mean Ribosome Machines</li> </ul> <p>“Incubator” Session as necessary</p> <p><u>Extend</u>  Students create songs, in teams, on one of the following topics (expert groups):</p> <ul style="list-style-type: none"> <li>• DNA Structure and Function</li> <li>• RNA Structure and Function</li> <li>• DNA Replication</li> <li>• RNA Replication</li> <li>• Genetics</li> <li>• Protein Synthesis</li> </ul> <p><u>Explain</u>  Each team of students will act as “experts” on their topic. They will present their information to the class and post it to Edmodo. At the end of their presentation, teams will play their topic song.</p> <p><u>Extend</u>  Socratic seminar about the informational text - Blocking a Fork In The Road To DNA Replication</p> <ul style="list-style-type: none"> <li>• Student created article questions will be used to direct the seminar (homework); teacher questions optional</li> <li>• Students will run the seminar with a designated monitor</li> </ul> <p><u>Evaluate</u>  DNA (Strawberry) Lab Report - Resubmission after peer review (use a form based on the lab report rubric) and teacher feedback</p> <p>Genetics Summative Test (LT 8-11) – multiple choice with justification for proficiency &amp; open response for advanced (student must score proficient before they are eligible for advanced status)</p>		
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			<p><u>Summarizing Strategy</u> 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.</p> <p><u>Homework</u> Informational Text – Blocking a Fork In The Road To DNA Replication <a href="http://www.sciencedaily.com/releases/2014/10/141030132959.htm">http://www.sciencedaily.com/releases/2014/10/141030132959.htm</a> Students will read the article and create 5 critical thinking questions that connect the article to the study of genetics. The questions must be open-ended and the student must also provide an advanced answer to each question. =====</p> <p>Sharing of scientific note-booking with partner (making notes to each other and resubmitting to the original sender &amp; teacher) =====</p> <p>Finish the DNA (Strawberry) Lab Report (use Good Notes or Pages) =====</p> <p>Review DNA/RNA Structure &amp; Function (including protein synthesis) 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 =====</p> <p>Students should be reviewing on a continuous basis using the App and any other digital resource in order to prepare for class and the LT 8-11 Genetics summative exam</p>		
2	<p>LT 9 - I can predict the genotype and phenotype of offspring based on mode of inheritance and parental data. (TNSPI 4.4 &amp; 4.5)</p> <p>LT 11 - I can explain bioethical issues related to gene technologies (genetic engineering, cloning, transgenic organism production, stem cell research, DNA</p>	<p><u>Technology:</u> * Apple TV * iPads</p> <p><u>Video Resources:</u> * Cooties</p> <p>(<a href="https://www.youtube.com/watch?v=w6ylxWcwkUM">https://www.youtube.com/watch?v=w6ylxWcwkUM</a>) *Spongebob Squarepants Video (<a href="https://www.youtube.com/watch?v=YrezDgPJ71M">https://www.youtube.com/watch?v=YrezDgPJ71M</a>) *Mr. Lee's – Genetics Rap (<a href="https://www.youtube.com/watch?v=_I0Ix_UJ5g&amp;list=PL2ExA0ZRIBI5ZMMOP7V4LYdFlhQyimSt9">https://www.youtube.com/watch?v=_I0Ix_UJ5g&amp;list=PL2ExA0ZRIBI5ZMMOP7V4LYdFlhQyimSt9</a>) * The Cell Online Textbook/As Reference (<a href="http://www.barrington.mysdhc.org">www.barrington.mysdhc.org</a>) * Crash Course Biology Videos/As Reference (<a href="https://www.youtube.com">https://www.youtube.com</a>)</p> <p><u>Apps:</u> * Cooties! * Genetics and Genetic Engineering App (Genetics 101) * Gene Screen</p>	<p><u>Essential Questions</u> 1. What is the relationship between chromosomes, genes, and alleles? 2. What is heredity and genetics? 3. What are the following genetics terms and how are they interrelated: trait, dominant, recessive, genotype, phenotype, ratio, probability, homozygous dominant, homozygous recessive, heterozygous, hybrid, and true or pure-breeding. 4. How can an organisms genotypes and phenotypes be used to predict the traits of their offspring? 5. What is a monohybrid cross and how does it compare to a dihybrid cross? 6. How is a Punnett Square used in the study of genetics?</p> <p>* Research Paper - What is meant by a bioethical issue, and how does it relate to various gene technologies?</p> <p><u>Set</u> Displayed on classroom TV the question Do you have Cooties? Have Cootie games at stations throughout the classroom.</p> <p><u>Engage</u> Show the Cooties Video</p> <p><u>Explore</u> Students create genetic characteristic instructions to go with their Cootie game. Students must also write 10 genetics problems to be solved while playing the Cooties game. The students must include the following terms in</p>	<p><u>Remediation</u> *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.</p> <p>*Students will log onto their Khan Academy account and watch the appropriate biology video; then students will go to <a href="http://www.sciencegeek.net">www.sciencegeek.net</a> and take the</p>	<p>Exit Slips twice a week</p> <p>Viewed videos along with probing &amp; clarifying questions are used as formative assessments</p> <p>Lab Report Writings with the following sections: *Title *Statement of the problem *Hypothesis *Materials *Procedure *Results (Data) *Conclusions (Biology Lab Report</p>

	fingerprinting ). (TNSPI 4.9)	* Health * Good Notes and/or Pages	<p>their game directions:</p> <ul style="list-style-type: none"> <li>• Dominant, recessive</li> <li>• Genotype, phenotype</li> <li>• Homozygous (dominant &amp; recessive), heterozygous</li> <li>• Punnett Square</li> <li>• Genotypic and Phenotypic Ratios</li> <li>• Pure or True-breeding</li> <li>• Traits</li> </ul> <p><u>Explain</u>          Once students/groups are done with their directions, they will exchange game directions with a neighboring group and play the Cooties game with the other teams directions. Teacher will monitor student groups during the “design and play process” in order to ask clarifying questions and assess student understanding.          “Incubator” Session as necessary</p> <p><u>Engage</u>          Spongebob Squarepants Video Clip</p> <p><u>Explore</u>          Students will complete the Bikini Bottom Genetics Problems #1:  <a href="http://sciencespot.net/Media/gen_spbobgenetics.pdf">http://sciencespot.net/Media/gen_spbobgenetics.pdf</a>          AND          Bikini Bottom Genetics Problems #2:  <a href="http://sciencespot.net/Media/gen_spbobgenetics2.pdf">http://sciencespot.net/Media/gen_spbobgenetics2.pdf</a></p> <p><u>Explain</u>          Students will share their work from the Bikini Bottom Genetics Problems in a Gallery Walk and Post-It Activity          “Incubator” Session as necessary</p> <p><u>Engage</u>          Mr. Lee’s Genetics Rap</p> <p><u>Extend</u>          Socratic seminar about the informational text - Fukushima's legacy: Biological effects of Fukushima radiation on plants, insects, and animals</p> <ul style="list-style-type: none"> <li>• Student created article questions will be used to direct the seminar (homework); teacher questions optional</li> <li>• Students will run the seminar with a designated monitor</li> </ul> <p><u>Evaluate</u>          Genetics Summative Test (LT 8-11) – multiple choice with justification for proficiency &amp; open response for advanced (student must score proficient before they are eligible for advanced status)</p> <p><u>Summarizing Strategy</u>          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.</p> <p><u>Homework</u></p>	<p>appropriate quiz (zes); then students submit a “selfie” screen shot of their score to the proper Edmodo assignment tab</p> <p><u>Enrichment</u>          *Students will peer tutor classmates that are struggling to master LTs at the proficient and/or advanced levels.</p> <p>*Students will lead lab groups in collaboratively designing investigations.</p> <p><u>Learning Styles</u>          Kinesthetic          Auditory          Secretarial          Visual          Technology-driven</p>	<p>Template and Rubric)</p> <p>Student-Led Lessons/Lab Investigations</p> <p>Writings on Informational Text from homework</p> <p>“Incubator” Sessions after major content studies and/or after finding student misconceptions through previous formative assessments. (Student-led or teacher-led seminar)</p>
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			<p>Informational Text – Fukushima's legacy: Biological effects of Fukushima radiation on plants, insects, and animals  <a href="http://www.sciencedaily.com/releases/2014/08/140814124535.htm">http://www.sciencedaily.com/releases/2014/08/140814124535.htm</a>  Students will read the article and create 5 critical thinking questions that connect the article to the study of genetics. The questions must be open-ended and the student must also provide an advanced answer to each question.  =====</p> <p>Sharing of scientific note-booking with partner (making notes to each other and resubmitting to the original sender &amp; teacher)  =====</p> <p>Review Genetics 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  =====</p> <p>Students should be reviewing on a continuous basis using the App and any other digital resource in order to prepare for class and the LT 8-11 Genetics summative exam</p>		
3	<p>LT 9 - I can predict the genotype and phenotype of offspring based on mode of inheritance and parental data. (TNSPI 4.4 &amp; 4.5)</p> <p>LT 11 - I can explain bioethical issues related to gene technologies (genetic engineering, cloning, transgenic organism production, stem cell research, DNA fingerprinting ). (TNSPI 4.9)</p>	<p><u>Technology:</u>  * Apple TV  * iPads</p> <p><u>Video Resources:</u>  *GENETicS  (<a href="https://www.youtube.com/watch?v=00nwOKiMVb8">https://www.youtube.com/watch?v=00nwOKiMVb8</a>)  *What are Pedigree Charts  (<a href="https://www.youtube.com/watch?v=Wuk0W10EveU">https://www.youtube.com/watch?v=Wuk0W10EveU</a>)  *Blood Type Groups  (<a href="https://www.youtube.com/watch?v=NjHgZhbn87Q">https://www.youtube.com/watch?v=NjHgZhbn87Q</a>)  * The Cell Online Textbook/As Reference (<a href="http://www.barrington.mysdhc.org">www.barrington.mysdhc.org</a>)  * Crash Course Biology Videos/As Reference (<a href="https://www.youtube.com">https://www.youtube.com</a>)</p> <p><u>Apps:</u>  * Genetics and Genetic Engineering App (Genetics 101)  * Gene Screen  * Health  * Good Notes and/or Pages</p>	<p><u>Essential Questions</u>  1. What are different modes of inheritance including incomplete dominance, codominance, multiple alleles, and sex-linked traits.  2. What is a pedigree and how is this tool used to trace inheritance of traits through families?</p> <p>Research Paper - What is meant by a bioethical issue, and how does it relate to various gene technologies?</p> <p><u>Set</u>  Pictures of other types of inheritance – incomplete dominance, codominance, multiple alleles, and sex-linked traits.</p> <p><u>Engage</u>  Students must figure out what the connection(s) between the various pictures in their envelope would be. There can be more than one right answer as long as the justification is appropriate.</p> <p><u>Explore</u>  Students will complete the Bikini Bottom Genetics Incomplete Dominance: (<a href="http://sciencespot.net/Media/gen_spbobincdom.pdf">http://sciencespot.net/Media/gen_spbobincdom.pdf</a>)</p> <p><u>Explain</u>  Students will share their work from the Bikini Bottom Genetics Problems in a Gallery Walk and Post-It Activity  “Incubator” Session as necessary</p> <p><u>Engage</u>  Blood Typing Video</p> <p><u>Explore</u>  Student will answer the question: How are human blood types inherited?</p> <ul style="list-style-type: none"> <li>• Students will research in collaborative groups.</li> <li>• Students will develop a lab, using everyday materials, to demonstrate inheritance of blood types.</li> <li>• Students will write and solve 5 difference blood type problems, one of</li> </ul>	<p><u>Remediation</u>  *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.</p> <p>*Students will log onto their Khan Academy account and watch the appropriate biology video; then students will go to <a href="http://www.sciencegeek.net">www.sciencegeek.net</a> and take the appropriate quiz (zes); then students submit a “selfie” screen shot of their score to the proper Edmodo assignment tab</p> <p><u>Enrichment</u></p>	<p>Exit Slips twice a week</p> <p>Viewed videos along with probing &amp; clarifying questions are used as formative assessments</p> <p>Lab Report Writings with the following sections:  *Title  *Statement of the problem  *Hypothesis  *Materials  *Procedure  *Results (Data)  *Conclusions (Biology Lab Report Template and Rubric)</p> <p>Student-Led Lessons/Lab Investigations</p> <p>Writings on Informational Text from</p>

			<p>which must be in a pedigree form.</p> <p><u>Explain</u> Students will share their work from the Bikini Bottom Genetics Problems in a Gallery Walk and Post-It Activity “Incubator” Session as necessary</p> <p><u>Engage</u> What are Pedigree Charts Video</p> <p><u>Explore</u> Student will answer the question: What are multiple alleles and sex-linked traits?</p> <ul style="list-style-type: none"> <li>• Students will research in collaborative groups.</li> <li>• Students will write and solve 10 difference blood type problems, three of which must be in a pedigree form.</li> </ul> <p><u>Extend</u> Socratic seminar about the informational text - Protein pathway involved in brain tumor stem cell growth identified</p> <ul style="list-style-type: none"> <li>• Student created article questions will be used to direct the seminar (homework); teacher questions optional</li> <li>• Students will run the seminar with a designated monitor</li> </ul> <p><u>Evaluate</u> Genetics Summative Test (LT 8-11) – multiple choice with justification for proficiency &amp; open response for advanced (student must score proficient before they are eligible for advanced status</p> <p><u>Summarizing Strategy</u> 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.</p> <p><u>Homework</u> Informational Text – Protein pathway involved in brain tumor stem cell growth identified <a href="http://www.sciencedaily.com/releases/2015/02/150226122439.htm">http://www.sciencedaily.com/releases/2015/02/150226122439.htm</a> Students will read the article and create 5 critical thinking questions that connect the article to the study of genetics. The questions must be open-ended and the student must also provide an advanced answer to each question. =====</p> <p>Sharing of scientific note-booking with partner (making notes to each other and resubmitting to the original sender &amp; teacher) =====</p> <p>Finish the Lab Report (use Good Notes or Pages) =====</p> <p>Review Genetics 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 =====</p> <p>Students should be reviewing on a continuous basis using the App and any</p>	<p>*Students will peer tutor classmates that are struggling to master LTs at the proficient and/or advanced levels.</p> <p>*Students will lead lab groups in collaboratively designing investigations.</p> <p><u>Learning Styles</u> Kinesthetic Auditory Secretarial Visual Technology-driven</p>	<p>homework</p> <p>“Incubator” Sessions after major content studies and/or after finding student misconceptions through previous formative assessments. (Student-led or teacher-led seminar)</p>
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			other digital resource in order to prepare for class and the LT 8-11 Genetics summative exam		
4	<p>LT 10 - I can describe how gametes are produced through meiosis and how genetic variation in a population is determined by sexual reproduction (genetic disorders/mutations). (TNSPI 4.6 &amp; 4.7 &amp; 4.8)</p> <p>LT 11 - I can explain bioethical issues related to gene technologies (genetic engineering, cloning, transgenic organism production, stem cell research, DNA fingerprinting ). (TNSPI 4.9)</p>	<p><b>Technology:</b> * Apple TV * iPads</p> <p><b>Video Resources:</b> *Mutations: The Potential Power of a Small Change (<a href="https://www.youtube.com/watch?v=Gi eZ3pk9YVo">https://www.youtube.com/watch?v=Gi eZ3pk9YVo</a>) *Human Genetic Engineering (<a href="https://www.youtube.com/watch?v=dK BfxoPnT7g">https://www.youtube.com/watch?v=dK BfxoPnT7g</a>) * The Cell Online Textbook/As Reference (<a href="http://www.barrington.mysdhc.org">www.barrington.mysdhc.org</a>) * Crash Course Biology Videos/As Reference (<a href="https://www.youtube.com">https://www.youtube.com</a>)</p> <p><b>Apps:</b> * Genetics and Genetic Engineering App (Genetics 101) * Gene Screen * Health * Good Notes and/or Pages</p>	<p><b>Essential Questions</b> 1. What are the phases of meiosis? 2. How does meiosis compare and contrast to mitosis? 3. What are gametes? 4. Why is it important for the phases of meiosis to precisely occur without interruption? 5. If meiosis is interrupted in any way, what are the possible implications? 6. What are some of the major genetic disorders that occur due to improper meiosis?</p> <p>Research Paper - What is meant by a bioethical issue and how does it relate to various gene technologies?</p> <p><b>Set</b> Have cut out of chromosomes on each table (the table is acting as the cell. Each table needs to represent a different phase of meiosis.</p> <p><b>Engage</b> Gamete Formation Video</p> <p><b>Explore</b> Student collaborative groups must figure out what their table represents and how it relates to the other tables in the classroom.</p> <ul style="list-style-type: none"> <li>• Students must include a drawing of each table in the correct order</li> <li>• All drawings must be labeled</li> <li>• All parts within the drawings must be labeled</li> <li>• All functions that are represented in the drawings must be labeled</li> </ul> <p><b>Explain</b> Student groups will defend their results from the Explore section “Incubator” Session as necessary</p> <p><b>Engage</b> Mutations Video Clip</p> <p><b>Explore</b> Students will create a children’s book describing the process of meiosis. The book must include visuals, descriptions, and the occurrence of mutations.</p> <p><b>Explain</b> “Incubator” Session as necessary</p> <p><b>Extend</b> Socratic seminar about the informational text - Meiotic cell division 'the other way round'</p> <ul style="list-style-type: none"> <li>• Student created article questions will be used to direct the seminar (homework); teacher questions optional</li> <li>• Students will run the seminar with a designated monitor</li> </ul>	<p><b>Remediation</b> *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.</p> <p>*Students will log onto their Khan Academy account and watch the appropriate biology video; then students will go to <a href="http://www.sciencegeek.net">www.sciencegeek.net</a> and take the appropriate quiz (zes); then students submit a “selfie” screen shot of their score to the proper Edmodo assignment tab</p> <p><b>Enrichment</b> *Students will peer tutor classmates that are struggling to master LTs at the proficient and/or advanced levels.</p> <p>*Students will lead lab groups in collaboratively designing investigations.</p> <p><b>Learning Styles</b></p>	<p>Exit Slips twice a week</p> <p>Viewed videos along with probing &amp; clarifying questions are used as formative assessments</p> <p>Lab Report Writings with the following sections: *Title *Statement of the problem *Hypothesis *Materials *Procedure *Results (Data) *Conclusions (Biology Lab Report Template and Rubric)</p> <p>Student-Led Lessons/Lab Investigations</p> <p>Writings on Informational Text from homework</p> <p>“Incubator” Sessions after major content studies and/or after finding student misconceptions through previous formative assessments. (Student-led or teacher-led</p>



			<p><u>Evaluate</u>  Genetics Summative Test (LT 8-11) – multiple choice with justification for proficiency &amp; open response for advanced (student must score proficient before they are eligible for advanced status)</p> <p>Research Paper - What is meant by a bioethical issue, and how does it relate to various gene technologies?</p> <p><u>Summarizing Strategy</u>  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.</p> <p><u>Homework</u>  Informational Text – Meiotic cell division 'the other way round'  <a href="http://www.sciencedaily.com/releases/2014/10/141029124555.htm">http://www.sciencedaily.com/releases/2014/10/141029124555.htm</a>  Students will read the article and create 5 critical thinking questions that connect the article to the study of genetics. The questions must be open-ended and the student must also provide an advanced answer to each question.  =====</p> <p>Sharing of scientific note-booking with partner (making notes to each other and resubmitting to the original sender &amp; teacher)  =====</p> <p>Review Meiosis 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  =====</p> <p>Students should be reviewing on a continuous basis using the App and any other digital resource in order to prepare for class and the LT 8-11 Genetics summative exam</p>	Kinesthetic Auditory Secretarial Visual Technology-driven	seminar)
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