

Emerson Middle School Integrated Lesson Form

Title: Week 7: September 21-25

Lesson Description: Genetic Mutations

|                              |  |
|------------------------------|--|
| <p>Educator</p>              | <p>Name: Elena Mackey<br/>                 A+ School: EMS<br/>                 Grade level/subject area: 7th Grade Science</p>   |
| <p>Curriculum &amp; Arts</p> | <p>Overarching Concept: Asexual reproduction<br/>                 Essential Question(s) and/or Focus Question(s)</p> <p>What is a genetic mutation?<br/>                 How do mutations happen?<br/>                 How do mutations affect proteins?<br/>                 What determines if a mutation is helpful?</p> <p>Disciplines Addressed: <span style="float: right;">21st Century</span><br/>                 skills:</p> <p><input type="checkbox"/> dance                      <input type="checkbox"/> music                      <input checked="" type="checkbox"/> visual arts                      <input checked="" type="checkbox"/> creativity<br/> <input type="checkbox"/> drama                      <input checked="" type="checkbox"/> reading                      <input checked="" type="checkbox"/> writing                      <input checked="" type="checkbox"/> problem<br/>                 solving<br/> <input type="checkbox"/> language arts <input checked="" type="checkbox"/> science                      <input type="checkbox"/> other:<br/> <input checked="" type="checkbox"/> technology<br/> <input checked="" type="checkbox"/> math                      <input type="checkbox"/> social studies<br/> <input checked="" type="checkbox"/> collaboration</p> <p>Curricular connections/instructional objectives: (state standards, etc.) MS LS 3-1</p> |
| <p>Enriched Assessment</p>   | <p>Ways to assess/evaluate students' understanding during and at the conclusion of the lesson</p> <p>Formative:<br/>                 Students will answer bellwork questions and critical thinking assignment questions that will gauge their understanding of new material.</p> <p>Summative:<br/>                 Students will complete daily exit slips.</p> <p>Note any unexpected outcomes with students and how they affected next steps:</p>   |

|   |   |   |  |  |                                      |  |   |   |   |
|---|---|---|--|--|--------------------------------------|--|---|---|---|
| <p>Collaboration</p>  | <p>How will collaboration be used: (between students, fellow teachers, or anyone with potential expertise):</p> <p>Students will work with partners to share their knowledge.<br/>I will guide classroom discussions to monitor understanding.<br/>I will meet with my 7th grade team after school this Wednesday to check our progress on our team goals.</p>  |   |  |  |                                      |  |   |   |   |
| <p>Multiple Learning Pathways</p>                           | <p>Multiple Intelligences addressed within lesson: (check all that apply)</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/>_x_bodily/kinesthetic</td> <td><input type="checkbox"/>_musical-rhythmic</td> </tr> <tr> <td><input checked="" type="checkbox"/>_x_interpersonal</td> <td><input type="checkbox"/>_naturalist</td> </tr> <tr> <td><input checked="" type="checkbox"/>_x_Intrapersonal</td> <td><input checked="" type="checkbox"/>_x_veral-linguistic</td> </tr> <tr> <td><input checked="" type="checkbox"/>_x_logical-mathematical</td> <td><input checked="" type="checkbox"/>_x_visual spatial</td> </tr> </table>   | <input checked="" type="checkbox"/> _x_bodily/kinesthetic | <input type="checkbox"/> _musical-rhythmic | <input checked="" type="checkbox"/> _x_interpersonal | <input type="checkbox"/> _naturalist | <input checked="" type="checkbox"/> _x_Intrapersonal | <input checked="" type="checkbox"/> _x_veral-linguistic | <input checked="" type="checkbox"/> _x_logical-mathematical | <input checked="" type="checkbox"/> _x_visual spatial |
| <input checked="" type="checkbox"/> _x_bodily/kinesthetic   | <input type="checkbox"/> _musical-rhythmic  |   |  |  |                                      |  |   |   |   |
| <input checked="" type="checkbox"/> _x_interpersonal        | <input type="checkbox"/> _naturalist  |   |  |  |                                      |  |   |   |   |
| <input checked="" type="checkbox"/> _x_Intrapersonal        | <input checked="" type="checkbox"/> _x_veral-linguistic   |   |  |  |                                      |  |   |   |   |
| <input checked="" type="checkbox"/> _x_logical-mathematical | <input checked="" type="checkbox"/> _x_visual spatial   |   |  |  |                                      |  |   |   |   |
| <p>Infrastructure</p>                                       | <p>Classroom Infrastructure/Setup:<br/>Timeframe (example: length of unit, number and length of lesson(s):<br/>Space:<br/>Material:<br/>Resources/books/websites/other information sources:<br/>Textbook, Google Classroom, Google Slides, YouTube<br/>Microscopes, Microscope lab worksheet</p> <p><b>Monday</b><br/>Bellwork: 10 min</p> <ul style="list-style-type: none"> <li>A. What is a genetic mutation? (Station’s activity 1)</li> <li>B. In what part of the cell cycle do mutations occur? (Station’s activity 2)</li> <li>C. Explain How you know your answer to part B is correct.</li> </ul> <p>Mutations video (7min)<br/><a href="https://www.youtube.com/watch?v=GieZ3pk9YVo">https://www.youtube.com/watch?v=GieZ3pk9YVo</a></p> <p>The cat ate the wet rat example (5 min)</p> <p>Mutation’s Effects Reading (10 min)<br/><a href="https://docs.google.com/document/d/10e_XadnbnM0VgQxT9YA-EKkdicNwA19tMUZErc-oyyM/edit">https://docs.google.com/document/d/10e_XadnbnM0VgQxT9YA-EKkdicNwA19tMUZErc-oyyM/edit</a></p> <p>Exit: (5 min)<br/>A mutation will always cause the wrong protein to be produced<br/>True or False? Explain your answer</p> |   |  |  |                                      |  |   |   |   |

**Tuesday:**

Bellwork: (10 min)

- A. According to the video from yesterday which mutation is most dangerous: a point mutation or a frameshift mutation? Explain
- B. Which mutation will be passed to to the offspring a body mutation or a sex cell mutation? Explain
- C. If a parent has a sex cell mution will the child have it also? Explain

Nathan's story and Follow Up Questions (10 min)

<https://www.youtube.com/watch?v=zdLJk61WeB4>

Mutation video (9:30)

<https://www.youtube.com/watch?v=8s4he3wLgkM>

Discussion: (5 min)

Should parents be able to choose their child's genes?

- A. Have a partner record pros and cons.

Research (10 min)

- B. Find an article that supports gene selection and summarize it in five facts.
- C. Find an article that is against gene selection and summarize it in five facts.
- D. For each summary, each person should record their own five facts from the articles.

Exit: We learned this week that a mutation can be harmful, helpful or neutral but what do you think determines the effect of a mutation?

**Wednesday:**

Bellwork; (10) min

Look at each slide in the slide show below.

[https://docs.google.com/presentation/d/1Fd1BD9N0kcdruf5TU-Yf8ccYp4vYDemm73860dH1W5c/edit#slide=id.g99841617ac\\_0\\_53](https://docs.google.com/presentation/d/1Fd1BD9N0kcdruf5TU-Yf8ccYp4vYDemm73860dH1W5c/edit#slide=id.g99841617ac_0_53)

- A. On the slideshow record whether each slide is a helpful, harmful or neutral mutation.
- B. For each slide explain why you chose the answer you did.

Pocket Mouse video (9 min)

<https://www.youtube.com/watch?v=sjeSEngKGrq>

Pocket Mouse Video Questions (5 min)

<https://docs.google.com/document/d/1IEbrhwW7Fdp6cmUe56LAzAgQ91OKOUeBz1ms6MWaA74/edit>

Mutations Kahoot 14 min

Exit: 5 min)

What determines if a mutation will be harmful, helpful or neutral

### **Thursday**

Bellwork: 5 min

Using your bellwork slide show from yesterday, give an example of a helpful, harmful and neutral mutation.

Read about Dolly the sheep here (15 min)

<https://dolly.roslin.ed.ac.uk/facts/the-life-of-dolly/index.html>

Answer these questions while you read:

1. Why was the project started?
2. What kind of cell was Dolly cloned from, specialized or unspecialized?
3. Why was this so amazing?

The Environment and Genetics(10 min)

Scientists have been able to alter genetics over the years to help the farming community. With a partner think of 5 beneficial mutations that could help a crop to survive and grow better.

Plant mutation video (2:50)

<https://www.youtube.com/watch?v=y4sCyuF4x2E>

Exit What was your favorite topic in science this week? (5 min)

### **Friday**

Bellwork (7 min)

- A. If a plant grows taller than the others to receive more sun, which plant will be more likely to survive and reproduce?

|  |   |   |   |   |  |  |  |  |  |
|--|---|---|---|---|--|--|--|--|--|
|  | <p>B. Explain how genetic mutations are expressed. Use your DNA notes for help.</p> <p>Work on the Study guide (15 min)</p> <p>Kahoot (15 min)<br/> <a href="https://create.kahoot.it/v2/details/c88cf1ae-0fee-4a61-a2c4-870eb6b87aeb">https://create.kahoot.it/v2/details/c88cf1ae-0fee-4a61-a2c4-870eb6b87aeb</a></p> <p>Exit : (5 min)</p> <p>A. Cancer is found in what type of cell?<br/> B. What type cell mutation will be passed to the offspring only</p>  |   |   |   |  |  |  |  |  |
| <p>Experiential Learning &amp; Climate</p>                             | <p>Steps/Process: (You may share by using this form, video, photostory, powerpoint, etc.) Please attach rubric, checklist or other assessment tool, if applicable.</p>  |   |   |   |  |  |  |  |  |
| <p>ISTE standards</p>  | <p>Check all that apply:</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/> Empowered learner</td> <td><input checked="" type="checkbox"/> Digital citizen</td> </tr> <tr> <td><input checked="" type="checkbox"/> Knowledge constructor</td> <td><input type="checkbox"/> Innovative designer</td> </tr> <tr> <td><input checked="" type="checkbox"/> Computational thinker communicator</td> <td><input checked="" type="checkbox"/> Creative</td> </tr> <tr> <td><input type="checkbox"/> Global collaborator</td> <td></td> </tr> </table> | <input checked="" type="checkbox"/> Empowered learner | <input checked="" type="checkbox"/> Digital citizen | <input checked="" type="checkbox"/> Knowledge constructor | <input type="checkbox"/> Innovative designer | <input checked="" type="checkbox"/> Computational thinker communicator | <input checked="" type="checkbox"/> Creative | <input type="checkbox"/> Global collaborator |  |
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| <input type="checkbox"/> Global collaborator                           |   |   |   |   |  |  |  |  |  |
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