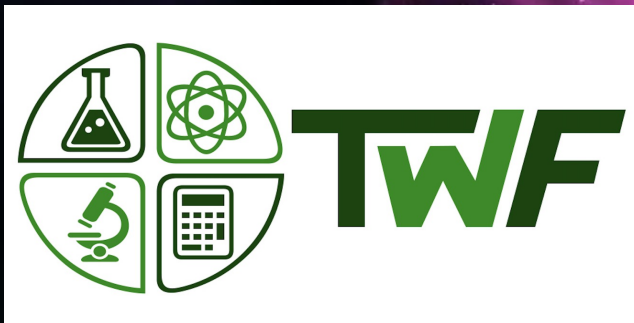


Mutations

5E Lesson

The 5E model is a scientifically proven method to improve student engagement and learning in your classroom

- ✓ Engagement
- ✓ Exploration
- ✓ Explanation
- ✓ Elaborate
- ✓ Evaluate



Complete Teacher Instructions

Mutations 5E Lesson

Grades 9-12	Mutations	Ongoing Les
Lesson Objective: Students will learn about: • Small-scale mutations • Large-scale mutations • Causes of mutations • Mutagens • Mutation results • Cancer • Bruce Ames • Quantum jitters • DNA		
Possible Student Misconceptions: • All mutations are bad • Mutations can be fixed		
Materials: • 1 device (smartphone, Chromebook, laptop, tablet, or computer) per 3 • A means of projecting a PowerPoint presentation • Internet access • General classroom objects		
Teacher Notes: ➢ All videos can be accessed directly from the PowerPoint. To retrieve the icon while in slideshow mode and it will automatically open for you. If for reason, right-click on the image and click Edit Hyperlink or something similar. ➢ I've created a video walkthrough if needed. It can be accessed here - https://youtu.be/oCIKIP9SaDQ ➢ I don't believe in long lessons. If you feel your students are losing their focus, stop the PowerPoint and give them a 5-minute break. If you'd like to see more of my video collection here - http://www.teachwithfergy.com are tons of brain-break videos to choose from all grouped by category.		

Mutations – 5E Lesson

Engagement Phase Your students will watch the video 'Mutations in DNA' and complete the questions found in the file – Engagement – Mutations in DNA Video . Teacher Notes: - The video is about two minutes long - You may need to show the video more than once or pause when an answer is given to one of the questions.	Dis Te le ur ☐ ☐ ☐ ☐
Exploration Phase Exploration – Lab Station Activity • In groups of 2-3, have your students complete Exploration – Lab Station Activity. Once they're done, they will submit their passport to you. Teacher Notes: • The complete instructions for my Lab Station activity can be found in the START HERE – Instructions file.	Dis Te le ur ☐ ☐ ☐
Explanation Phase PowerPoint Lessons • The lesson is found in the folder – Explanation – Lesson • This lesson is designed to be completed over two days • There is one embedded video and plenty of opportunity to engage, interact and check for your students' understanding throughout the lesson • The lesson covers the following topics: ➢ Mutations overview ➢ Small-scale mutations ➢ Missense mutations ➢ Nonsense mutations ➢ Silent mutations ➢ Frameshift mutations ➢ Large scale mutations ➢ Causes ➢ Mutagens Teacher Notes: • All videos can be accessed directly from the PowerPoint. To retrieve them, click on the video icon while in slideshow mode and it will automatically open for you. If they don't open, right-click the image and select Edit Hyperlink or something similar. • I've created a video walkthrough if needed. It can be accessed here - https://youtu.be/oCIKIP9SaDQ	Dis Te cc m pr ☐ ☐ ☐ ☐

• I have also enclosed a .PDF version of both the teacher and student versions.	
Elaborate Phase Elaborate – Scavenger Hunt Your students will complete – Elaborate – Scavenger Hunt . This activity will require your students to move beyond what was covered directly in the lesson and allow them to further develop their understanding. Teacher Notes: - Students will work individually or in small groups - Students will need one device per group	Duration: 1 hour Teacher Role – Facilitate learning and keep students focused Goal ☐ Students use their newly obtained knowledge to propose solutions and extend their learning to new situations
Evaluate Phase Quiz Have your students complete - Evaluate – Mutations Quiz Teacher Notes: ➢ It's sometimes best to have the students peer evaluate ➢ Placing students in small groups and having them exchange papers to mark will accomplish two things 1) Provide immediate feedback on the questions they just completed 2) Significantly reduce your marking time ➢ Peer evaluation is not needed, only suggested when appropriate	Duration: 30 min Teacher Role – Distribute and collect evaluation Goal ☐ Students are given the opportunity to demonstrate their understanding and evaluate their own progress

Each phase is clearly described

A Complete Lesson

Silent Mutation

- Occurs when the change in one or more base pairs does not affect the functioning of the gene.
- The mutated DNA sequence codes for the same amino acid as the non-mutated sequence, and the resulting protein is not altered.

Silent Mutations			
ATG	GAA	GCA	CGT
Met	Glu	Ala	Gly
↓			
ATG	GAG	GCA	CGT
Met	Glu	Ala	Gly

← Make sure your students are on track

Student copies with blanks
Videos embedded right into
your slideshow

Silent Mutation

- Occurs when the change in one or more base pairs does not affect the functioning of the gene.
- _____

Silent Mutations			
ATG	GAA	GCA	CGT
Met	Glu	Ala	Gly
↓			
ATG	GAG	GCA	CGT
Met	Glu	Ala	Gly

What can changing one
base pair do?



Sickle Cell

Interactive and Engaging Activities

Mutations Lab Station Activity



7 Lab Station Activities to get your kids out of their seats and engaged in their learning

Device-Based Scavenger Hunt Mutations

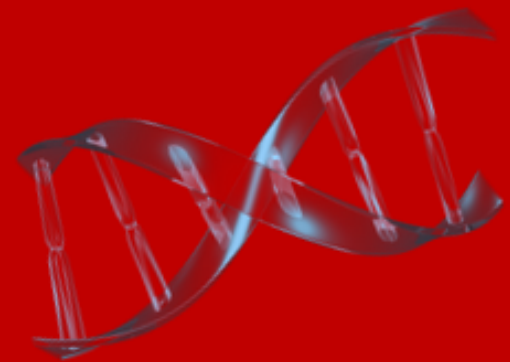


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