

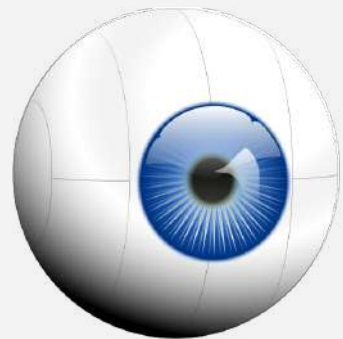
Gene Expression & Mutations Stations

Self Directed Activity

Directions - Proceed through each of the following stations. Following the directions as written. If a question arises, talk amongst your group members first, then if a consensus is not reached, please seek assistance from your instructor

Station 1

Watch It



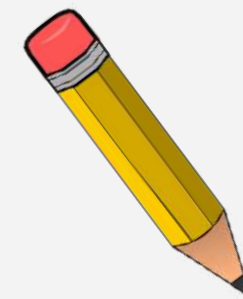
Station 2

Video It



Station 3

Write It



Station 4

Examine It



Gene Expression & Mutations Stations

Self Directed Activity

Directions - Proceed through each of the following stations. Following the directions as written. If a question arises, talk amongst your group members first, then if a consensus is not reached, please seek assistance from your instructor

Station 5

Answer It



Station 6

Perform It



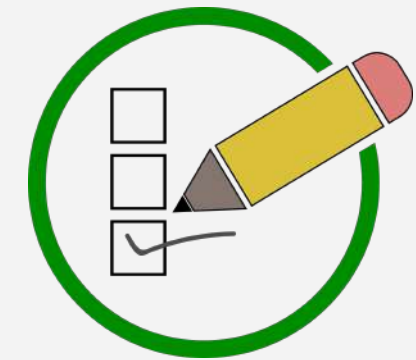
Station 7

Read It



Station 8

Evaluate it





Watch It – Station 1

How are genes regulated?

Question 1

Dna makes proteins through which process?

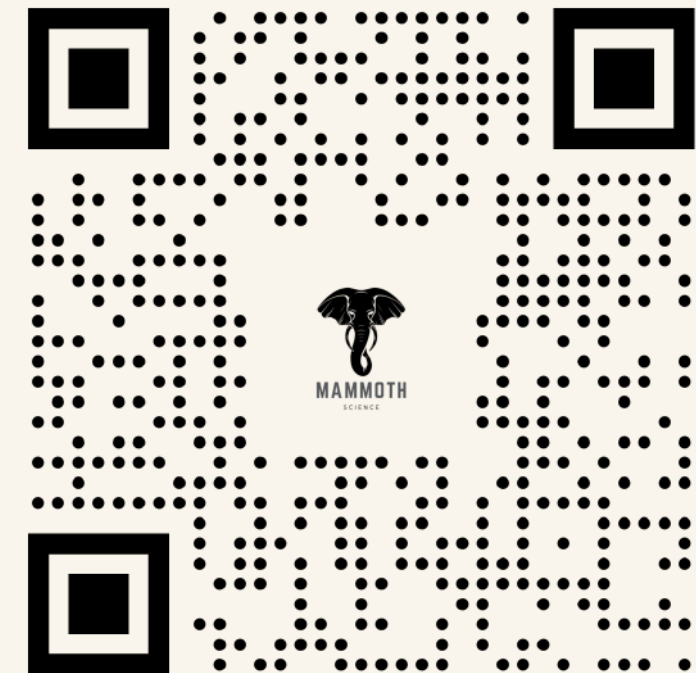
Question 2

What is gene Regulation?

Question 3

Directions

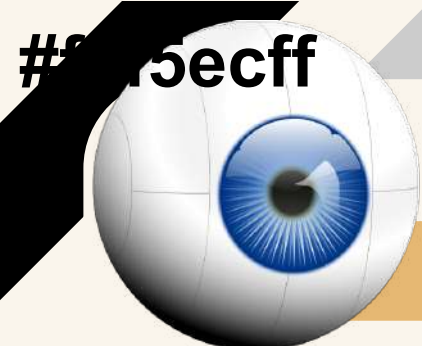
Watch the following video



Answer
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Stations 1-4



Station 1 – Continued

How do binding proteins increase transcription?

Question 4

How do prokaryotes regulate genes?

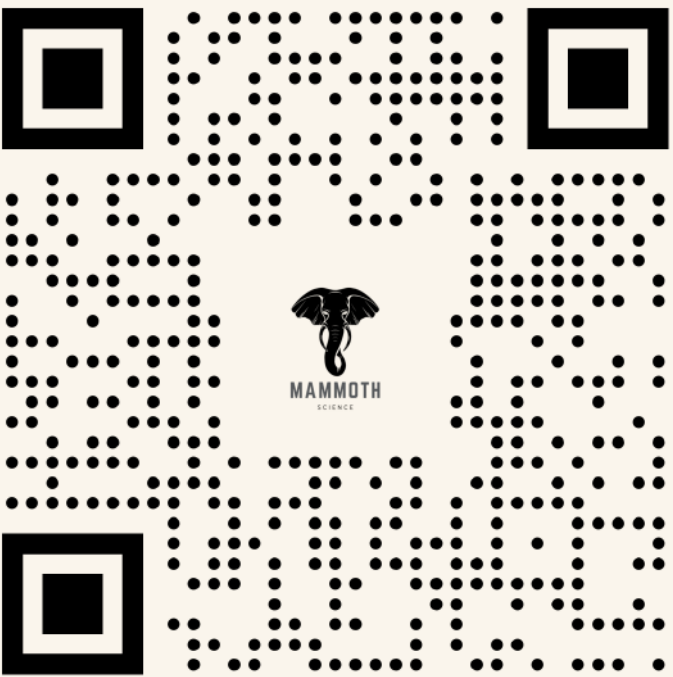
Question 5

Define Operon...

Question 6

Directions

Watch the following video



Answer the

questions



Station 1 – Continued

What are the key players in an operon?

Question 7

What is a promoter? Operator? Repressor?

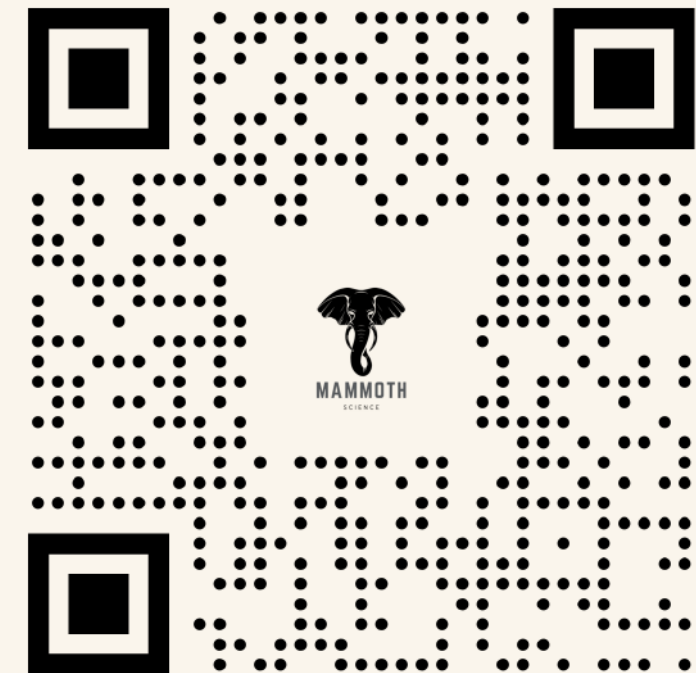
Question 8

How does the lac operon function? - simple summary.

Question 9

Directions

Watch the following video



Answer
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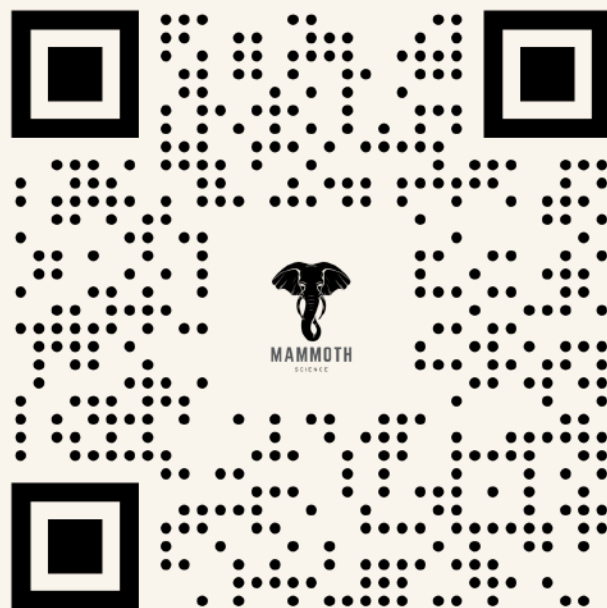


Station 2 – Video It

Directions

Make a flipgrid video of about 3 minutes. Your video should include the following information, using the sentence stems right. Use the [link](#) or QR Code Below to access...

- Explain what a mutation is
- Differentiate between the 5 forms of mutations
- Provide an example of each using a notecard, illustrating a mutated sequence from the original sequence of DNA: AATTC CGT GAA



“A mutation is...”

“The 5 forms of mutations are...” Examples of each type is...”

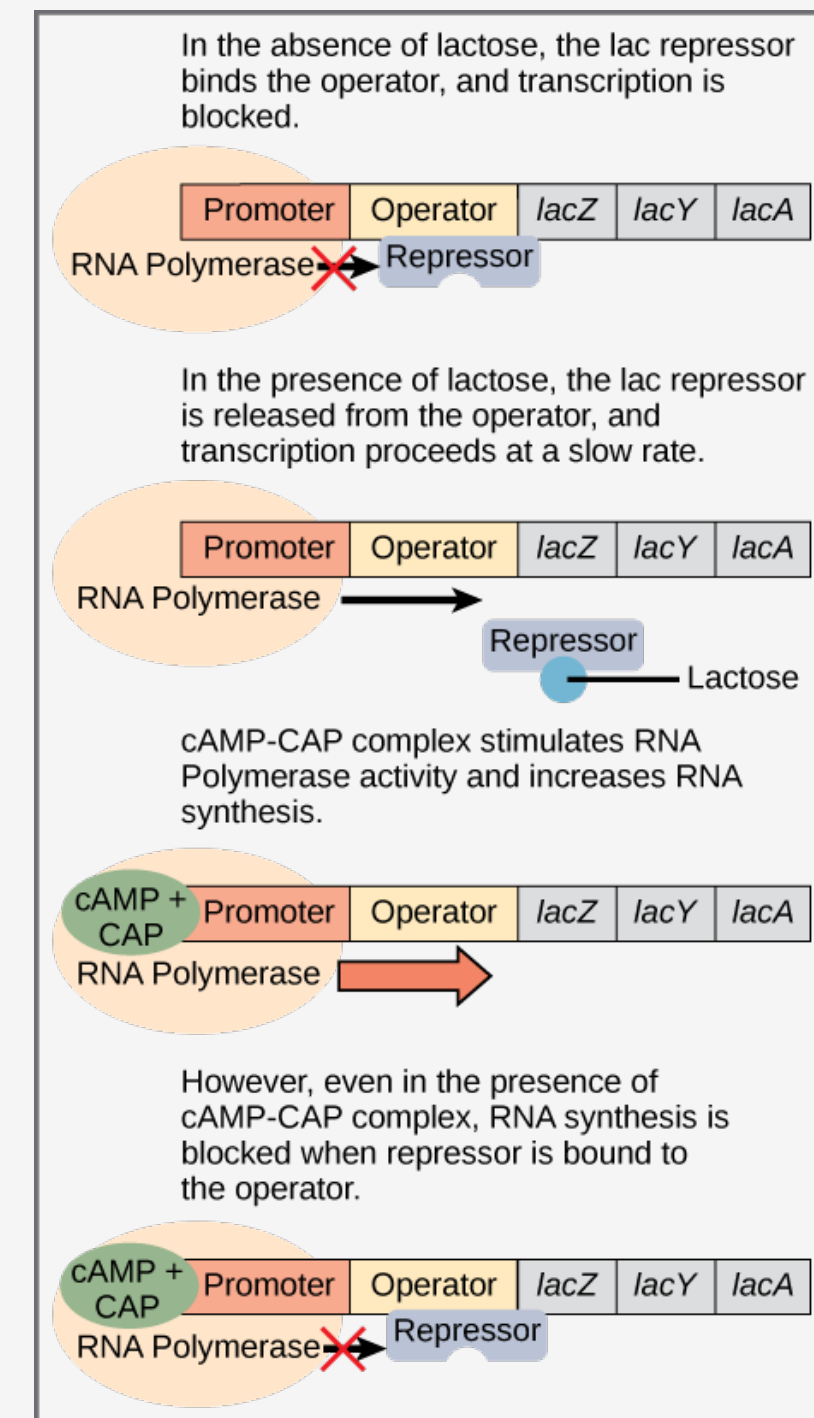
“Mutations are good in that they provide...”

“Mutations are sometimes bad because they...”

Write It

In a quickwrite (3-5 Sentences) - Using the image below...

In E. coli, the trp operon is on by default, while the lac operon is off. Why do you think that this is the case?





TH

Examine It

Look at the following DNA Sequences and their mutated sequence - replicate, transcribe (use complementary sequence) and translate them accordingly to reveal the polypeptide and identify the mutation type

A**B**

TAC GGC TAA ATT CCC GGG TAC ACG TAC

TAC GGC TAA ATT CGC CGG GTA CAC GTA C

GCG ATT TAC GCA ACC TGG TCC CGT CGA

GCG GTT TAC GCA ACC TGG TCC CGT CGT



Answer It

1. *Name two differences between prokaryotic and eukaryotic cells and how these differences benefit multicellular organisms.*
2. *Describe how transcription in prokaryotic cells can be altered by external stimulation such as excess lactose in the environment.*
3. *What is the difference between a repressible and an inducible operon?*
4. *A mutation within the promoter region can alter transcription of a gene. Describe how this can happen.*
5. *What could happen if a cell had too much of an activating transcription factor present?*
6. *Describe how RBPs can prevent miRNAs from degrading an RNA molecule.*
7. *How can external stimuli alter post-transcriptional control of gene expression?*
8. *How can understanding the gene expression pattern in a cancer cell tell you something about that specific form of cancer?*



Perform It – Station 6

Use the QR code right or follow the LINK here.

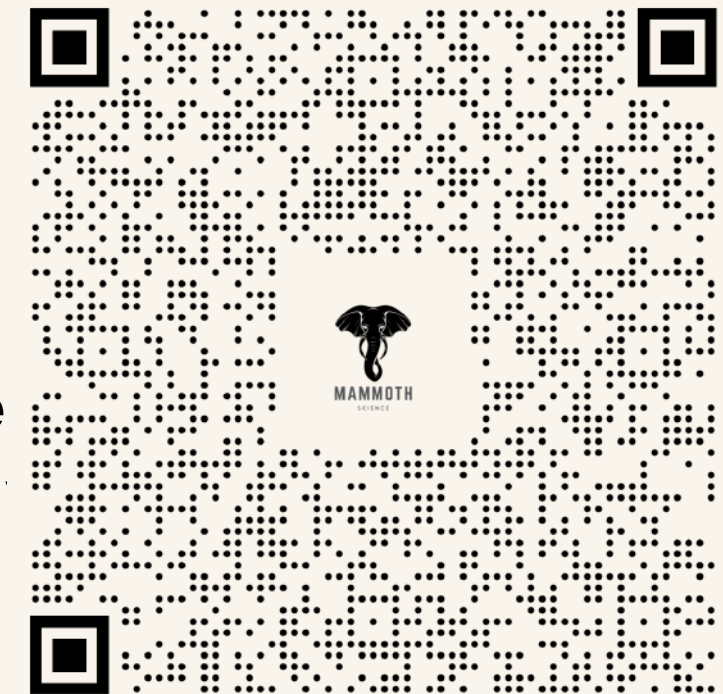
Directions

- *Enter this DNA nucleotide sequence (avoid extra spaces!):*
ATGCTCTGTTTATCTACGTCTACCAACAGCCCATCAGAACAGGATGAGTGGCGAAGCGGA
- *Click Transcribe and watch the simulation.*
- *Click Translate and watch the simulation.*

- *Examine the resulting protein.*
- *Click the amino acids to learn their names.*
- *Take a screenshot of the protein.*
- *Describe the process in the simulation to a partner. What happens?*

Directions

Perform the following lab simulation



Answer
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Question 1

Stations 5-8



Perform It – Station 6

- *Substitute an A for the ninth nucleotide. Click Edit the DNA nucleotide sequence and manually change it OR press <<Skip until you see the DNA strands, click on the ninth nucleotide on the TOP strand, and substitute the T for an A.*

Directions

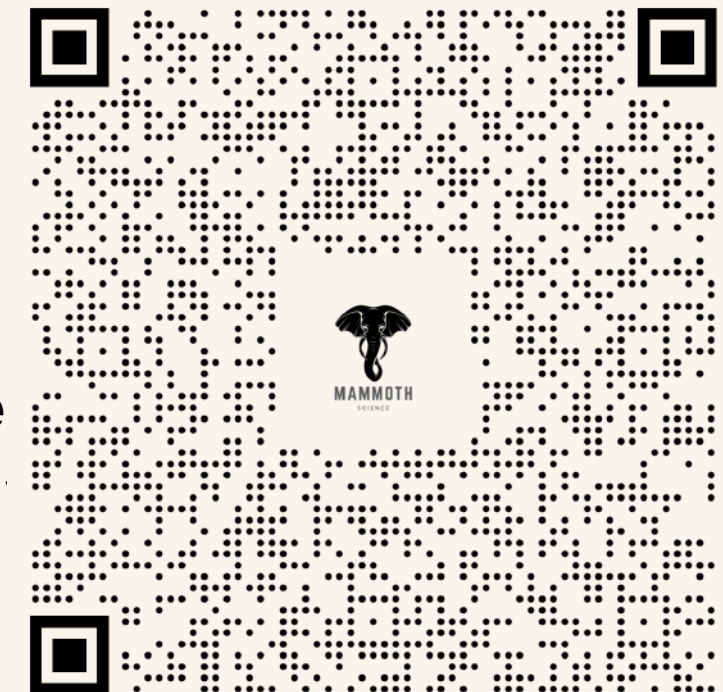
- *Rerun the simulation and examine the resulting protein*
- *Compare the new protein to your screenshot from Part 1.*
- *Substitute a C for the ninth nucleotide.*

- *Does a DNA mutation always change the protein? Why or why not?*
- *What is a stop codon and what does it "stop" from happening?*
- *In addition to substitution mutation, in what other ways can a DNA nucleotide sequence mutate?*

Question 2

Directions

Perform the following lab simulation



Answer the

left from ded



Station 7 – Read It

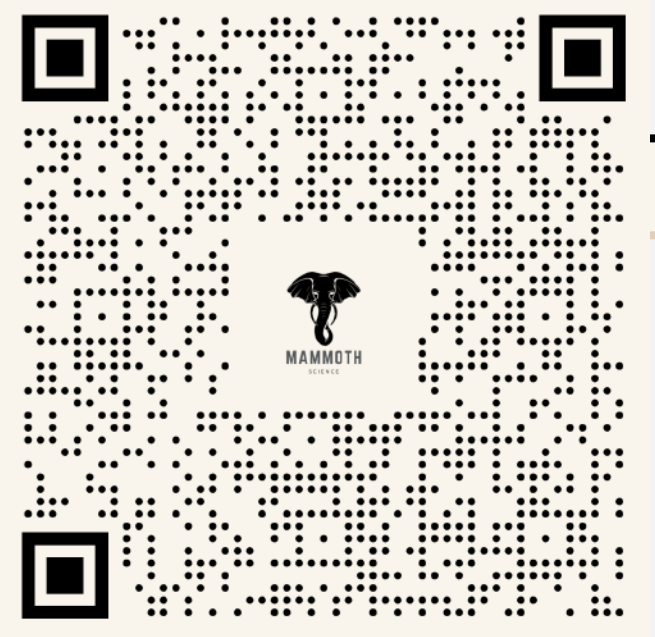
Main Idea

summary

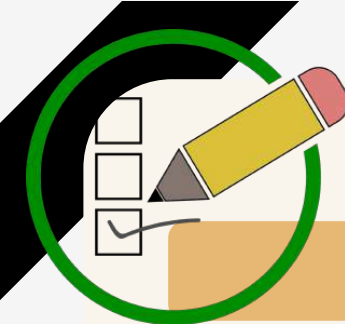
Article

Inferences

How is it connected to learning



Stations 5-8



Station 8 – Evaluate It

TH

what do I know?

List at least 5 items:

what do I wonder?

List at least 4 items:

what have I learned?

List at least 5 Items:

Stations 5-8