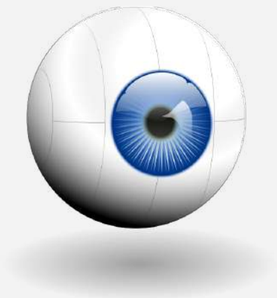
# DNA Stations

## 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

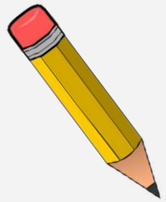


### Station 2

Video It

### Station 3

Write It



### Station 4

Examine It

# DNA 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

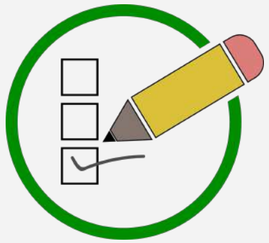
Perform It

### Station 7

Read It

### Station 8

Evaluate it



# Watch It – Station 1

***What is the function of DNA?***

Question 1

***What is the monomer of DNA?***

Question 2

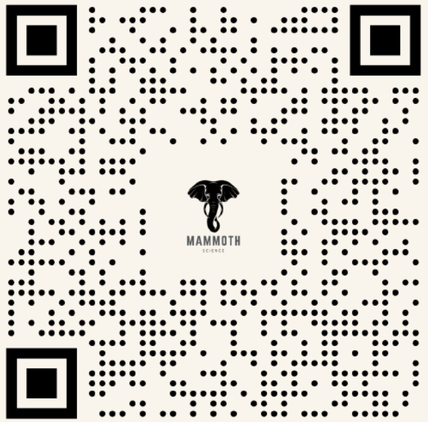
***Identify and Describe the Base Pairing of DNA.***

Question 3

## Directions

Watch the following video

Answer the v eft from ided




Stations 1-4

# Station 1 – Continued

*Compare and contrast Purines and Prymidines.*

Question 4

*What are the three parts of the monomer of DNA? What do they do specifically?*

Question 5

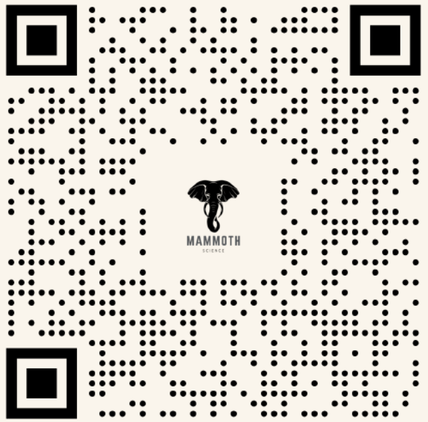
*In what phase of the cell cycle is DNA replicated? Be Specific...*

Question 6

## Directions

Watch the following video

Answer the v eft from ided




Stations 1-4

# Station 1 – Continued

***What are the 5 enzymes (in order) used for replication to occur?***

Question 7

***Define semiconservative replication***

Question 8

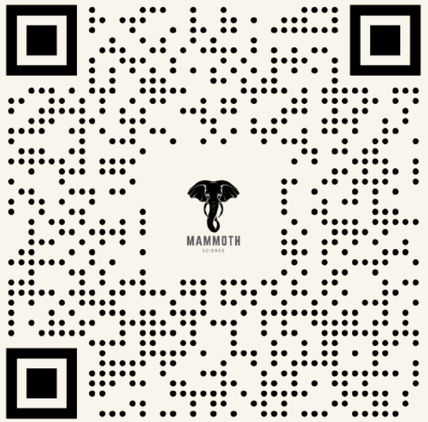
***What is a, "change in DNA" called?***

Question 9

## Directions

Watch the following video

Answer the v eft from ided




Stations 1-4

# Station 2 – Video It

## Directions

Make a video of about 3 minutes. Your video should include the following information, using the sentence stems right.

*Insert (copy & paste) your video link into your answer doc*

Some Video creation suggestions:

- Loom
- Screencast-o-matic
- Screencastify
- Animoto

- Summarize the structure of DNA (nucleotides, base pairing, sugar-phosphate backbone, etc)
- Talk your way through the 5 enzymes responsible for DNA replication
    - Replicate the following strand:

AATCGGTGCCCAAACTGGTTCAAA

***"The structure of DNA…"***

***"The 3 parts of a nucleotide are…"***

***"The base pairings for DNA are as follows…."***

***"The enzymes responsible for replication are…their functions are…"***

***"The complementary strand for the DNA strand listed would be…"***

Stations 1-4

# Write It

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

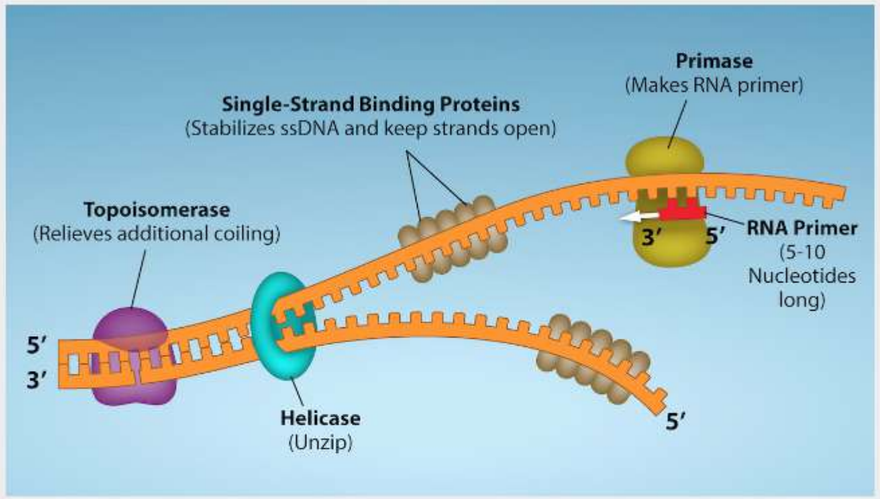



**Figure 14.14** First Components of DNA Replication. As DNA replication begins, DNA Helicase, a large enzyme, separates the two strands of DNA so that they can act as templates for replication. Single-strand binding proteins bind to each strand to stabilize and prevent them from reforming the double helix. Primase, an RNA polymerase, binds to the single stranded DNA and synthesizes a short RNA primer in the 5' to 3' direction that is antiparallel to the parental strand. This RNA primer allows for DNA polymerase to begin replicating the DNA. Topoisomerase binds to the double helix upstream of the replication fork to prevent additional coiling by making small cuts in one of the DNA strands. Credit: Rao, A., Ryan, K. Fletcher, S. and Tag, A. Department of Biology, Texas A&M University.

*You isolate a cell strain in which the joining of Okazaki fragments is impaired and suspect that a mutation has occurred in an enzyme found at the replication fork. Which enzyme is most likely to be mutated?*

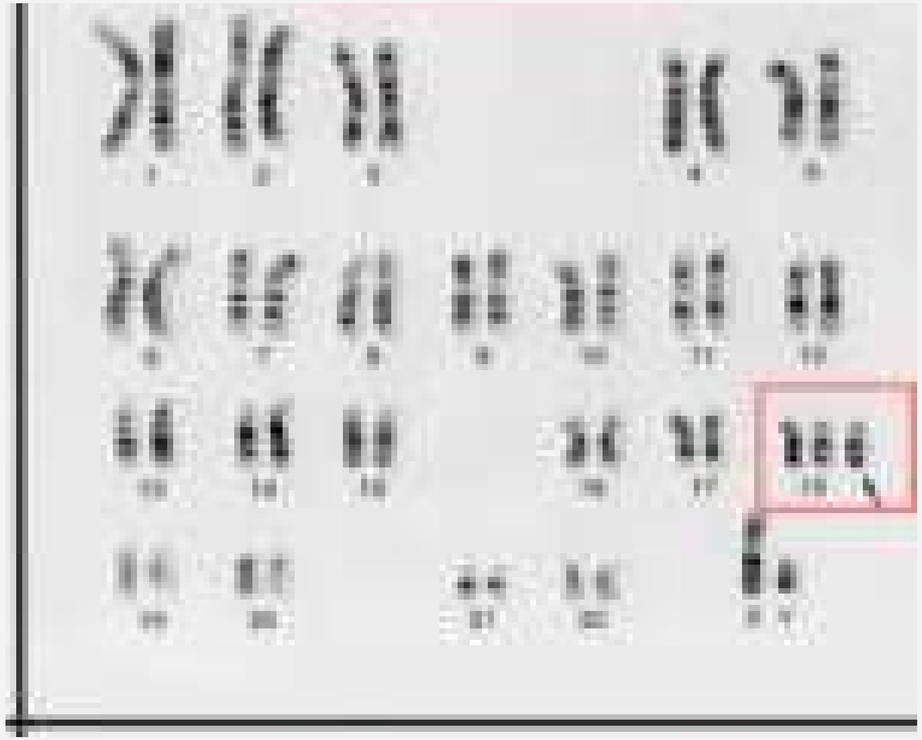
Stations 1-4

# Examine It

**Looking at the karyotypes below, determine which one is abnormal and explain why**

A

B



Stations 1-4

# Answer It

1. *Explain Griffith's transformation experiments. What did he conclude from them?*
2. *Describe the structure and complementary base pairing of DNA.*
3. *Prokaryotes have a single circular chromosome while eukaryotes have linear chromosomes. Describe one advantage and one disadvantage to the eukaryotic genome packaging compared to the prokaryotes.*
4. *How did the scientific community learn that DNA replication takes place in a semi-conservative fashion?*
5. *DNA replication is bidirectional and discontinuous; explain your understanding of those concepts.*
6. *Explain the events taking place at the replication fork. If the gene for helicase is mutated, what part of replication will be affected?*
7. *What is the role of a primer in DNA replication? What would happen if you forgot to add a primer in a tube containing the reaction mix for a DNA sequencing reaction?*
8. *An adult with a history of tanning has his genome sequenced. The beginning of a protein-coding region of his DNA reads ATGGGGATATGGCAT. If the protein-coding region of a healthy adult reads ATGGGGATATGAGCAT, identify the site and type of mutation - mutation types - http://www2.csudh.edu/nsturm/CHEMXL153/DNAMutationRepair.htm#:~:text=Types%20of%20Mutations,base%20substitutions%2C%20deletions%20and%20insertions.*

Stations 5-8

# Perform It – Station 6

***Use the QR code right or follow the LINK here.***

Directions

***Work your way through the simulation.***

***Who is responsible for discovering what we know today as our genetic code - DNA?***

Question 1

## Directions

Watch the following lab simulation

Answe eft from
the ded

Stations 5-8

# Station 7 – Read It

Main Idea

summary

Article

Inferences

How is it connected to learning

Stations 5-8

# Station 8 – Evaluate It

## 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