Name: _____ Date: _____ Period: _____

# Biology Notes: Mutations

Directions: Fill in the blanks as we cover the topic in the PowerPoint.

**Mutations**

- Defined: Any _____ in an organism's _____
- Where: Single _____ or entire _____
  - Some gene mutations _____ phenotype
    - Example: Can cause a _____ stop codon
  - Some gene mutations _____ phenotype.
    - Example: Could be _____ or occur in a non-coding region (meaning area where those nucleotides don't code for an amino acid).
- When: Throughout the _____ of the cell

**Gene: Point Mutations**

- Defined: _____nucleotide is _____ for another
  - Often _____ by spellchecker enzyme
  - May lead to _____ change (*See notes for animation)*

| DNA | ACA | GTG | GTC | AAA |
|---|---|---|---|---|
| **mRNA** | | | | |
| **tRNA anticodons** | | | | |
| **Amino Acid** | | | | |

- In the table above, what if the DNA letters 'GTG' were mutated to 'GTT':
  - What would the mRNA become? _____
  - What would the tRNA become? _____
  - Which Amino Acid would now be delivered to the ribosome? _____
- May _____ lead to any change (_____ Mutation)
  - Ex: DNA "CCC" is mutated into "CCG" (Then the mRNA "GGG" is mutated to "GGC")
    - _____ amino acid is created (_____)

**Point Mutation and Sickle Cell Disease**

- Hemoglobin (_____) is made from 574 _____ _____
- _____ cell disease is caused because of _____ wrong _____ _____

**Gene: Frame Shift Mutation**

- Defined: _____ /_____ of a nucleotide
  - _____ sequence of DNA/RNA after the mutation is shifted (*See notes for animation)*
  - Much more _____ to the structure/function of the final _____
    - mRNA sequence may have an _____ or _____ "stop codon"

**Impact on Offspring**

- Somatic cell mutations
  - Affect _____ the _____
  - _____ passed on to future _____
  - Ex: _____ cell mutation
- Germ cell mutations
  - Germ cells = the _____ cells that undergo _____ to make sperm & _____
  - _____ be passed to _____ generations

**Mutation Causes**

- Mutagen: agents in the _____ that can change _____
  - _____ up replication process
  - Break apart _____
- Ex: _____ from sunlight breaks _____ bond between thymine (T) and _____ (A)

**Review**

1) How are proteins affected if the DNA code is mutated? Example: ATTCGAGG is mutated to ATTCGTGG

   _____

2) What is the difference between point mutations & frame shift mutations?

   _____

3) When are mutations passed on to future generations? _____

4) What are germ cells?

   _____

5) What is a mutagen and how do they cause problems?

   _____

6) Are all mutations considered bad/dangerous? Explain.

   _____

   _____