Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_

**Mutations Worksheet – U7P2**

Thank you to Flinn Scientific for the original version of this assignment

**Part A: Point vs. Frameshift Mutations**

**Normal DNA Sequence:**

****

**Mutated DNA Sequence #1:**

****

**Mutated DNA Sequence #2:**

****

**Mutated DNA Sequence #3:**

****

1. Circle the location of the mutation in each of the three mutated sequences given above.
2. Transcribe the normal DNA sequence into mRNA and translate the mRNA into amino acids. Abbreviate the amino acids with the first three letters of their names. You will need to use a codon chart!

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| DNA | TAC | GTA | GTC | ACC | TAA | TGG | ATC |
| mRNA |  |  |  |  |  |  |  |
| Amino Acids |  |  |  |  |  |  |  |

1. Transcribe Mutated DNA Sequence #1 into mRNA and translate the mRNA into amino acids. Abbreviate the amino acids with the first three letters of their names. You will need to use a codon chart!

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| DNA | TAC | GTA | GTC | AGC | TAA | TGG | ATC |
| mRNA |  |  |  |  |  |  |  |
| Amino Acids |  |  |  |  |  |  |  |

1. What type of mutation is seen in Mutated DNA sequence #1—point or frameshift? If it is a point mutation, is it a silent, missense, or nonsense mutation? If it is a frameshift mutation, is it an insertion or a deletion?
2. Transcribe Mutated DNA Sequence #2 into mRNA and translate the mRNA into amino acids. Abbreviate the amino acids with the first three letters of their names. You will need to use a codon chart!

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| DNA | TAC | GTA | TGT | CAC | CTA | ATG | GAT | C |
| mRNA |  |  |  |  |  |  |  |  |
| Amino Acids |  |  |  |  |  |  |  |  |

1. What type of mutation is seen in Mutated DNA sequence #2—point or frameshift? If it is a point mutation, is it a silent, missense, or nonsense mutation? If it is a frameshift mutation, is it an insertion or a deletion?
2. Transcribe Mutated DNA Sequence #3 into mRNA and translate the mRNA into amino acids. Abbreviate the amino acids with the first three letters of their names. You will need to use a codon chart!

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| DNA | TAC | GTA | GTC | CCT | AAT | GGA | TC |
| mRNA |  |  |  |  |  |  |  |
| Amino Acids |  |  |  |  |  |  |  |

1. What type of mutation is seen in Mutated DNA sequence #3—point or frameshift? If it is a point mutation, is it a silent, missense, or nonsense mutation? If it is a frameshift mutation, is it an insertion or a deletion?

**Part B: Types of Point Mutations**

**Normal DNA Sequence:**

****

**Mutated DNA Sequence #1:**

****

**Mutated DNA Sequence #2:**

****

**Mutated DNA Sequence #3:**

****

**Mutated DNA Sequence #4:**

****

1. Circle the location of the mutation in each of the four mutated sequences given above.
2. Transcribe the normal DNA sequence into mRNA and translate the mRNA into amino acids. Abbreviate the amino acids with the first three letters of their names. You will need to use a codon chart!

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| DNA | TAC | CCT | AGG | AAT | ATC | AAA |
| mRNA |  |  |  |  |  |  |
| Amino Acids |  |  |  |  |  |  |

1. Transcribe Mutated DNA Sequence #1 into mRNA and translate the mRNA into amino acids. Abbreviate the amino acids with the first three letters of their names. You will need to use a codon chart!

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| DNA | TAC | CCT | AGG | AAA | ATC | AAA |
| mRNA |  |  |  |  |  |  |
| Amino Acids |  |  |  |  |  |  |

1. Is the type of point mutation seen in Mutated DNA Sequence #1 a silent, missense, or nonsense mutation?
2. Transcribe Mutated DNA Sequence #2 into mRNA and translate the mRNA into amino acids. Abbreviate the amino acids with the first three letters of their names. You will need to use a codon chart!

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| DNA | TAC | CCT | AGC | AAT | ATC | AAA |
| mRNA |  |  |  |  |  |  |
| Amino Acids |  |  |  |  |  |  |

1. Is the type of point mutation seen in Mutated DNA Sequence #2 a silent, missense, or nonsense mutation?
2. Transcribe Mutated DNA Sequence #3 into mRNA and translate the mRNA into amino acids. Abbreviate the amino acids with the first three letters of their names. You will need to use a codon chart!

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| DNA | TAC | ACT | AGG | AAT | ATC | AAA |
| mRNA |  |  |  |  |  |  |
| Amino Acids |  |  |  |  |  |  |

1. Is the type of point mutation seen in Mutated DNA Sequence #3 a silent, missense, or nonsense mutation?
2. Transcribe Mutated DNA Sequence #4 into mRNA and translate the mRNA into amino acids. Abbreviate the amino acids with the first three letters of their names. You will need to use a codon chart!

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| DNA | TAG | CCT | AGG | AAT | ATC | AAA |
| mRNA |  |  |  |  |  |  |
| Amino Acids |  |  |  |  |  |  |

1. Is the type of point mutation seen in Mutated DNA Sequence #4 a silent, missense, or nonsense mutation?