Name: Date: Class:

**Score: /20**

**Directions: Begin by going to the Webquest page on my Weebly:** [**ecampbellasuprep.weebly.com/webquest.html**](http://ecampbellasuprep.weebly.com/webquest.html)**. From here, you will access all of the links below. Answer all of the questions. You do NOT need to use complete sentences.**

**Due: End of class**

**Part 1: An Overview of DNA and Protein**

♣ Go to the first link: (<http://learn.genetics.utah.edu/content/basics/>) Click on “**What is DNA?”** and go through the animation and then answer the questions below.

1. The complete set of instructions for making a human being is found where?
2. What do genes tell the cell to make?

♣ (Go back to: <http://learn.genetics.utah.edu/content/basics/>) Click on **“What is a gene?”** and go through the animation and then answer the questions below.

1. What is the function of the protein hemoglobin?
2. How is sickle-cell anemia caused?
3. What are some other proteins that genes code for?

♣ (Go back) Click on **“What is a chromosome?”** and go through the animation and then answer the questions below.

1. How long would the DNA in one human cell be?
2. How is DNA packaged to fit into the small space of a cell nucleus?
3. How many chromosomes are in a human cell?
4. Why are there “pairs” of chromosomes? Where do they come from?

♣ (Go back) Click on **“What is a protein?”** and go through the animation. Answer the questions.

1. “There are proteins involved in the making of proteins.” Explain this sentence.

♣ (Go back) Click on “**What is heredity?**” and go through the animation and then answer the questions below.

1. Give an example of the environment acting on the expression of a genetic trait.
2. Where do we get our traits?

♣ (Go back) Click on “**What is a trait?”** and go through the animation and then answer the questions below.

1. Give an example of a physical trait that can be influenced by the environment.
2. Give an example of a behavioral trait that can be influenced by the environment.
3. Give an example of a predisposition to a medical condition that can be influenced by the environment.

**Part 2: Protein Synthesis**

♣ Go to the second link on my Weebly: (<http://learn.genetics.utah.edu/content/molecules/transcribe/> ) Scroll DOWN below the animation and read

1. The two-step process by which cells can read a gene and produce a string of amino acids

that will eventually become a protein is called: and .

1. How is mRNA different from DNA?
2. Summarize the differences between transcription and translation in the chart.

|  |  |  |  |
| --- | --- | --- | --- |
| **Process** | **Beginning Material** | **Ending Material** | **Location (where in cell it happens)** |
| **Transcription** |  |  |  |
| **Translation** |  |  |  |

♣ Scroll back UP to the animation. Click the button that says “click here to begin”. Use the keyboard to type the bases that would form the mRNA. Follow the instructions to determine the order of the amino acids.

1. List the order of your amino acids.
2. How did the process know to end?

**Part 3: The Central Dogma**

♣ Go to the third link on my Weebly: (<http://learn.genetics.utah.edu/content/molecules/centraldogma/>)

1. What is the “Central Dogma”?
2. Read about each of the molecules in the animation by clicking on them. Fill out the table below.

|  |  |  |
| --- | --- | --- |
| **Molecule** | **Location in Cell** | **Function** |
| DNA |  |  |
| mRNA |  |  |
| tRNA |  |  |
| rRNA |  |  |

**Part 4: More Info**

♣ Go to the fourth link on my Weebly: ([www.wisc-online.com/objects/index\_tj.asp?objid=AP1302](http://www.wisc-online.com/objects/index_tj.asp?objid=AP1302))

Read the animation page by page – just click the “next” button when you are ready to move on.

1. How does the mRNA leave the nucleus?
2. How many amino acids does each codon code for?

**Part 5: DNA Workshop**

♣ Go to the fifth link from my Weebly: ([http://www.pbs.org/wgbh/aso/tryit/dna/#](http://www.pbs.org/wgbh/aso/tryit/dna/)) and click on “DNA Workshop Activity”

♣ Click: “DNA replication” (upper left) and then click “unzip”. Read the script, answer the questions below, and then, click “OK”.

1. In a real cell, what does the DNA molecule do before it unzips?
2. What molecules break the rungs (bases) apart?

♣ Drag the correct bases over to “synthesize” the new DNA halves then read the script, answer the questions, and then click “OK”.

1. How many base pairs are in the real human genome?

♣ Go back to click on DNA Workshop Activity but now click on “protein synthesis” (upper right) and then click “unzip”.

1. How much of the DNA molecule actually unzips in a real cell?

♣ Base pair the nucleotides for just one half of the DNA. Read the script, answer the questions, and then click “OK”.

1. About how many bases would a real mRNA molecule have?
2. Where does the mRNA go now?

♣ Match the tRNA molecules to their base pair nucleotides on the mRNA and then answer the questions below.

1. Which molecule has the codons?
2. Which molecule has the anticodons?
3. What molecules are attached to the tRNAs?

♣Click “OK” and continue matching the tRNAs. Read the script, answer the questions and then click “OK”.

1. Where does the first tRNA go?

**Part 6: DNA Double Helix Game:**

♣ Go to the sixth link on my Weebly: ([nobelprize.org/educational\_games/medicine/dna\_double\_helix/](http://nobelprize.org/educational_games/medicine/dna_double_helix/))

♣ Click on “**Play DNA Game**”; Click “next” and reading each page, continue to click next until you come to the game. Click on organism #1 and match the base pairs as fast as you can! It is hard.

Click Next and then click on each organism until you identify the one that belongs to chromosome #1; continue playing the game with the other two chromosomes, filling in the chart below.

Be careful, other teams may get different results.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Chromosome # | How many  chromosomes? | How many base  pairs? | How many  genes? | What is the  organism? |
| **1** |  |  |  |  |
| **2** |  |  |  |  |
| **3** |  |  |  |  |

**Part 7: Summary**

Summarize what you learned through this activity using 3-5 complete sentences.

This Webquest was adapted from the following sites: <http://www.rtsd.org/cms/lib/PA01000218/Centricity/Domain/306/DNA%20and%20RNA%20Webquest.docx> <http://www.marinebiotech.net/program/biotechnology/lesson_plans/Childers_gene_to_protein_lesson_plan.pdf>

<http://www.ignacioschools.org/view/1143.pdf>