

Name(s): _____, _____ Due: _____ Period: _____

Dandy DNA Model Fun!

Total: _____/50 points!!

Your job is to build a model demonstrating the structure of deoxyribonucleic acid, or D.N.A. DNA is shaped like a double helix (a twisted ladder). It is made of nucleotides that contain a sugar, a phosphate, and a nitrogen base. It is the differences in DNA structure that make you a unique individual.

You can use any materials you want (except food that may spoil). You may work individually or with a partner. No more than two to a group will be allowed. Pairs must sign up ahead of time. A short write-up must be completed on the back side of this sheet and turned in with your model.

I. Model Requirements _____/30 (5 points each)

- Must contain at least 15 base pairs (21 if you are working with a partner)
- Sides of the ladder must be alternating sugar and phosphates and nitrogen bases are attached to the sugars, not the phosphates
- All nitrogen bases are used and paired appropriately
- Hydrogen bonds are represented between the nitrogen bases (correct number of hydrogen bonds – CG (triple) and AT (double))
- Double Helix Shape (twisted ladder)
- Use of proper start and stop codons at beginning and end of model

Example: Start: AUG Stop: UAA, UAG, or UGA

II. Planning/Key _____/5 points

Sugar= _____

Phosphate= _____

Adenine= _____

Thymine= _____

Guanine= _____

Cytosine= _____

Hydrogen Bonds= _____

Draw your model here:

How will you hook everything together? _____

III. Protein Synthesis _____/5 pts.

Write down your DNA code (both sides), the messenger RNA strand (from the left side of your DNA), and then the chain of amino acids – your positively perfect protein. (5 points)

| | | |
|----------------|-----------------------|-----------------------------|
| Your DNA code: | mRNA strand (single): | Protein (amino acid chain): |
|----------------|-----------------------|-----------------------------|

Constructed Response _____/ 10 pts.

Use the vocabulary below write 1-2 paragraphs explaining IN YOUR OWN WORDS how the code in our DNA is used to make proteins. Start in the nucleus and end at the Golgi. Refer to your project specifically to support your answer.

Examples:

- On my project the first 3 nitrogen bases were ...
- Part of my DNA code was ... which created an RNA strand of ...
- The codon ... linked the amino acid ...
- The nitrogen bases ... resulted in the start codon ...

Vocabulary:

DNA Nucleus mRNA Ribosome Codon Nitrogen Bases Protein Amino Acid