## Data Set #5

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| Type of response: | Non-Source Dependent Response |
| Grade level: | 10 |
| Subject: | Biology |
| Training set size: | 1795 |
| Final evaluation set size: | 599 |
| Average length of responses: | 60 words |
| Scoring: | Score1, Score2 |
| Final score: | Final score is score 1. Score 2 is for inter-rater reliability purposes. |
| Rubric range: | 0-3 |

#### Prompt—Protein Synthesis Item

Starting with mRNA leaving the nucleus, list and describe four major steps involved in protein synthesis.

#### Rubric for Protein Synthesis

Key Elements:

* mRNA exits nucleus via nuclear pore.
* mRNA travels through the cytoplasm to the ribosome or enters the rough endoplasmic reticulum.
* mRNA bases are read in triplets called codons (by rRNA).
* tRNA carrying the complementary (U=A, C+G) anticodon recognizes the complementary codon of the mRNA.
* The corresponding amino acids on the other end of the tRNA are bonded to adjacent tRNA’s amino acids.
* A new corresponding amino acid is added to the tRNA.
* Amino acids are linked together to make a protein beginning with a START codon in the P site (initiation).
* Amino acids continue to be linked until a STOP codon is read on the mRNA in the A site (elongation and termination).

Rubric:

##### 3 points

Four key elements

##### 2 points

Three key elements

##### 1 point

One or two key elements

##### 0 points

Other