Data Set #5

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