Proficiency Scale of SEP6 with Example DCI Content Standards

Proficiency Scale for SEP6 Constructing Explanations

SEP6 Constructing Explanations			
(4) Exceeds	**(3) Meets Proficiency**	**(2) Approaching**	**(1) Developing**
In addition to proficiency, I can make connections to unfamiliar contexts and/or related science concepts	I can construct explanations using all success criteria ☐ Accuracy of claim ☐ Accurate & relevant evidence (qualitative and/or quantitative) ☐ Accurately reasons with scientific content (DCI)	I can construct explanations using some success criteria	I attempt to construct explanations
Standard/DCI: Add Standard or DCI here			

Alexandra Kollman, 2023

Part 4- CER Moth DNA to Protein

SEP6: Constructing Explanations

4	3	2	1
I can construct an explanation for a scientific phenomenon using all success criteria in unfamiliar contexts AND/OR making connections to related science concepts	I can construct an explanation for a scientific phenomenon using all success criteria in familiar contexts • Accuracy of claim (e.g., qualitative or quantitative) • Evidence is accurate and relevant (e.g., specific, in context, trends and patterns) • Accurately applies scientific reasoning to support the claim (ELO Content)	I can construct an explanation for a scientific phenomenon using some success criteria in familiar contexts	I can construct an explanation for a scientific phenomenon in familiar contexts with support

ELO6: Construct an explanation based on evidence that the structure of DNA and chromosomes code for the structure of a protein, which carry out essential functions of life, expressed as a trait that is passed from parent to offspring.

Driving Question: What caused phenotypic variation in the moth population?

Claim: Changes in DNA strands can cause a phenotypic variation in the moth population.

Evidence: Letters

The mutation found in the light moth DNA strand is a(n) missense mutation. Use evidence from the model to justify your choice of mutation. In the DNA sequence Light moth had TAG instead of CAG which caused a change in AA

The mutation found in the albino moth DNA strand is a(n) Frameshift (insertion) mutation. Use evidence from the model to justify your choice of mutation. instead of having TCG, the sequence was ATC-GCA as an A shifted every allele to the right causing the strand to end early

Reasoning: *How does the structure of DNA determine the structure and function of proteins? How can this impact phenotype?* DNA transcribes to MRNA that translate to AA which makes the protien structure. The Shape the protie makes when it Folds determines the phenotype. In the DNA strand for light moths had a missense mutation as a change of TAG instead of CAG in dark moths caused the MRNA & thus the AA to change to Ile & not Val. This causes the strand to fold different & thus causes a lighter phenotype in moths. For the Albino moth a Frameshift mutation had an insertion of A in ATC instead of TCG which translated to UAG for the MRNA & caused the amino acid to fold the protien different & stop early (thus the white/albino phenotype).

AA makes protien structure which folds — its Shape causes a change in phenotype