

Variable name	Concept Type	Concept name	Concept Description
KC_Variation	Normative scientific idea	Variation	The presence and causes of variation (mutation/recombination/sex)
KC_Heritability	Normative scientific idea	Heritability	The heritability of variation (The degree to which a trait is transmitted from parents to offspring)
KC_Competition	Normative scientific idea	Competition	A situation in which two or more individuals struggle to get resources that are not available for everyone
KC_LimitedResources	Normative scientific idea	Limited resources	Limited resources related to their survival such as food and predator and reproduction such as pollinator
KC_DiffSurvival	Normative scientific idea	Differential survival/ reproduction	The differential reproduction and/or survival of individuals
KC_NonAdaptive	Normative scientific idea	Non-adaptive idea	Genetic drift and related non-adaptive factors contributed to evolutionary change
NI_Adapt	Non-normative naïve idea	Adapt/acclimation	Adjustment or acclimation to circumstances (which may be inherited)
NI_Need	Non-normative naïve idea	Need/goal	Goal-directed change; needs as a direct cause of evolutionary change
NI_Use	Non-normative naïve idea	Use/disuse	The use (or lack of use) of traits directly causes their evolutionary increase or decrease

**Concepts** Detected in Written Explanations  
by **EvoGrader**



Variable name	Description
KC_Score	Total number of key concepts within item (min 0 and max 6)
NI_Score	Total number of naïve ideas within item (min 0 and max 3)
Model_Type	Model 1: Normative scientific model (Explanation composed exclusively of scientific ideas)
	Model 2: Mixed model (Explanation composed of a mixture of non-normative naïve and scientific ideas)
	Model 3: Non-normative naïve model (Explanation composed exclusively of non-normative naïve ideas)
	Model 4: None (Explanation composed of no concept)