**Cognitive Skill Level Descriptions for the Biology MCAS Test**

Below are examples of cognitive skill level descriptions for the MCAS Biology test. The examples are not an exhaustive list. How an item is written, including the stem and the options (key and distractors), may contribute to the cognitive skill assigned to the item. The cognitive skill level may also depend on student experiences, such as certain investigations or experiments they are familiar with. In addition, the grade level at which the question is being asked is also a consideration.

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| **Cognitive Skill** | **Description** |
| ***Remembering*** | **Students identify or define a concept with no context.** *Note: Not on STE MCAS tests.* |
| ***Understanding/******Level 1*** | **Students show an understanding of scientific and engineering concepts and skills by:*** Completing a simple model, such as identifying the missing reactants or products in photosynthesis or cellular respiration equations.
* Identifying a scientific process, such as decomposition or DNA replication, in a given model or based on a description.
* Describing basic functions of parts of a system, such as, the function of the small intestine in the digestive system or the role of a secondary consumer in a food web.
* Interpreting information from a table or simple graph to draw a conclusion, such as determining that death rate is increasing because of a disease becoming more common or identifying the expected percentage of offspring from a completed Punnett square.
* Determining the materials needed for a familiar investigation, such as a source of carbon dioxide, light, and water for a photosynthesis investigation.
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| ***Applying/******Level 2*** | **Students apply their science and engineering knowledge and skills by:*** Interpreting data from a graph or table to draw a conclusion, such as describing the oxygen levels when given carbon dioxide levels for a given process or drawing a conclusion about the relatedness of organisms from a table.
* Interpreting an unfamiliar or complex model to draw a conclusion, such interpreting a food web to describe what would happen to a secondary consumer population if a primary consumer population decreased or determining a step in a familiar feedback loop.
* Solving a quantitative problem, such as determining the amount of available energy at a certain trophic level (10% rule).
* Providing evidence that supports a claim about a scientific phenomenon, such as determining the relatedness among species in a cladogram or using the results of Punnett squares to construct explanations about crosses.
* Describing or explaining a scientific concept when given an unfamiliar context, such as explaining how natural selection acted on a population.
* Determining what scientific question to ask given certain data and/or criteria.
* Determining which variables should be controlled in an investigation and those that may change.
* Writing a testable question that can be asked for an investigation or experiment. (CR items only)
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| ***Analyzing & Evaluating/******Level 3*** | **Students analyze or evaluate data and information using their science knowledge and skills by:*** Analyzing data from multiple tables or graphs to draw a conclusion or develop an explanation, such as analyzing allele frequencies to explain how the production of a protein in a population may change over time or evaluating data from graphs or tables to draw multiple conclusions about a population size over time.
* Drawing a conclusion from a complex model or multiple models using scientific knowledge, such as analyzing an unfamiliar feedback loop to determine what would happen for a given scenario.
* Analyzing a model and describing how changing multiple components of the model affects another variable or component of the model, such as analyzing a food web where multiple populations are changed and then determining the effects of these changes on other populations in the food web.
* Revising a model after interpreting information or data and explaining the reasoning for the revision(s), such as revising a cladogram to show the relatedness among multiple organisms. (CR items only)

Note: Some items will reach this level due to students needing to construct an explanation in a constructed response (CR) based on an application of their knowledge. |