ISTEP+ Science Item Sampler Grade 10

Updated December 2015

Purpose:

The purpose of the item sampler is to provide teachers and students with examples of the different types of questions that will appear on the ISTEP+ Part 1 science assessment. The types of questions include: constructed response and extended response. Teachers are encouraged to use this information as a resource to help create other assessments.

Constructed Response (CR) and Extended Response (ER) Items:

Constructed response and extended response items require a higher level of thinking, and the extended response items may be slightly more complex. Extended response items, in general, will also take students longer to respond. Both constructed response and extended response items may require students to provide an explanation or justification within the item.

Scoring Rubrics:

The scoring rubrics used for the CR and ER items are developed in such a way as to score items more analytically and to report students' scores more accurately. For each CR and ER item, students will receive a score for the content being assessed.

Grade 10 Sample Items

1. Describe the main function of a chloroplast.

   _____

   _____

   Explain the relationship between the main function of a chloroplast and the main function of a mitochondrion in a plant cell.

   _____

   _____

   _____

   _____

Standard: B.2.3: Explain that most cells contain mitochondria (the key sites of cellular respiration), where stored chemical energy is converted into useable energy for the cell. Explain that some cells, including many plant cells, contain chloroplasts (the key sites of photosynthesis) where the energy of light is captured for use in chemical work. DOK: 2

2-point Constructed-Response (CR) Rubric

Key elements:

* Any response indicating that the main function of a chloroplast is to perform photosynthesis and make food for the plant.

* Any response indicating that a chloroplast makes food for the plant and a mitochondrion breaks down food to provide energy for the plant.

2 points: Response contains both key elements

1 point: Response contains one of the two key elements

0 point: Response contains neither key element

2. A tall plant with red flowers is crossed with another plant of the same species that is short and has white flowers. The offspring (F1) of this cross are all tall with red flowers.

   Identify the genotype of the F1 generation plants and label each allele with its trait.

   Genotype of F1 generation: _____

   Alleles: _____
   _____

   Explain why there were no short plants with white flowers in the F1 generation.
   _____
   _____
   _____
   _____

Standard B.7.1, Distinguish between dominant and recessive alleles and determine the phenotype that would result from the different possible combinations of alleles in an offspring. DOK: 3

4-point Constructed-Response (CR) Rubric

Key elements:

* Any response indicating that the genotype of the F1 generation is RrTt AND
* Any response indicating that R=red flowers, r=white flowers, T=tall plants and t=short plants
* Any response indicating that all of the plants in the F1 generation have one dominant allele for each gene AND
* Any response indicating that when a dominant allele is present, it is expressed and the recessive allele is masked/not expressed

4 points: Response contains all four key elements

3 points: Response contains three of four key elements

2 points: Response contains two of four key elements

1 point: Response contains one of four key elements

0 point: Response contains no key elements