TN Department of Education

Biology 2 Instructional Materials Scoring Rubric

Gateway: The publisher must provide a Tennessee standards alignment guide as a part of the scope and sequence for the material. If this gateway is not met, the materials will not be scored. All Tennessee standards must be addressed within the material. If this is not met, the material will not pass review by the Tennessee Textbook and Instructional Materials Quality Commission.

Introduction:

The following Instructional Materials Scoring Rubric for Science is designed to score materials in the following categories:

- Instructional Focus
- Attending to Multiple Dimensions of Science Instruction
- Accessibility Features
- Alignment of Content

Scoring:

Each section is to be scored using a 0, 1, or 2. Use the following scoring guideline.

Tables 1-2:

- Adhere to the provided rubric statements for scoring.

Tables 3-4:

- 0: The standard is not present within the material.
- 1: The standard is present within the material. The intent and/or frequency component of the standard is not fully met.
- 2: A rating of 2 indicates the standard is present and all aspects of the standard are fully met.

Table 1: Instructional Focus					
Directions: **Adhere to the provided rubric statements for scoring.**					
Indicator	**0**	**1**	**2**	**Score**	**Evidence**
Central Phenomenon	Unit has **no phenomenon, or only a "hook"** to capture student interest at the beginning of the unit.	All units include one or more **smaller phenomenon or design challenge(s) and/or not all lessons connect to the phenomenon** or design challenge.	All units have a central phenomenon or design challenge that **develops throughout every lesson** of the unit.		
Activity Purpose	Material contains hands-on activities **do not serve** to grade-level scientific ideas	Hands-on activities **reinforce** scientific ideas aligned with grade-level standards.	All hands-on activities serve to **uncover** scientific ideas aligned with grade level standards.		
Use of Science Engineering Practices (SEPs)	Some units **do not provide students opportunities** to use the SEPs.	SEPs are present in all units, but **loosely or not connected to central phenomenon**.	In every unit, the **primary use** of the SEPs ties directly to explaining the central phenomenon or solving the design challenge.		
Student Engagement	**Neither of the given features** are present.	**One of the given features** is present.	Materials give students opportunities to: • expressly connect the DCI content from each lesson to		

Table 1: Instructional Focus **Directions:** **Adhere to the provided rubric statements for scoring.**					
			relevant crosscutting concepts. • practice with the SEP that is relevant to that day's lesson.		
Concepts before vocabulary.	Materials **pre-teach vocabulary.**	In **some instances**, materials develop conceptual meaning first.	In **all instances**, materials provide experiences (e.g., investigations, data analysis, discussions) where students develop conceptual meaning of a scientific idea before introducing technical vocabulary.		
Connections across component ideas.	Materials **describe** connections for students, or connections are absent.	Some units include **standalone questions** in place of activities, where students communicate their understanding of connections between component ideas.	All units include **activities** where students communicate their understanding of connections between science ideas from *two or more component ideas* within the grade (e.g., LS1.A and LS2.C, ESS2.A and PS1.A).		
Connections across disciplines.	Materials **describe** connections for students,	Some units include **standalone questions** in place of activities, where	All units include activities where students communicate their		

Table 1: Instructional Focus **Directions:** **Adhere to the provided rubric statements for scoring.**					
	or connections are absent.	students communicate their understanding of connections between component ideas.	understanding of connections between science ideas from *two or more disciplines* within the grade (e.g., LS and PS).		
Review opportunities	End of unit review is **not anchored to a phenomenon**.	End of unit review assesses learning of the **central phenomenon for the unit** only.	Materials provide opportunities for students to transfer new learning to **analogous phenomenon** in a review at the end of every unit.		
			Total		

Table 2: Attending to Multiple Dimensions of Science Learning **Directions:** **Adhere to the provided rubric statements for scoring.**					
Indicator	**0**	**1**	**2**	**Score**	**Evidence**
Distribution of SEPs as required by the standards	Materials **do not include** a focal SEP for one or more units.	One or more SEPs are **disproportionately** featured as the focal SEP.	Materials identify one or more focal science and engineering practices (SEPs) for every unit(s) with a **balanced** distribution of all SEPs as a focal SEP throughout the units.		

Table 2: Attending to Multiple Dimensions of Science Learning **Directions:** **Adhere to the provided rubric statements for scoring.**					
Support for a focal SEP	**No** student facing or teacher facing supports for the SEPs.	Relevant **support strategies are absent** from teacher materials.	Every unit contains a focal SEP is featured in **student-facing materials and teacher materials** including instructional strategies for the particular unit and focal SEP.		
Connections across to crosscutting concepts as required by the standards.	Materials **describe connections with CCCs** or do not specifically address CCCs.	In every unit students make connection between the CCCs and **either** the SEPs or DCIs.	In every unit, students make connections between the crosscutting concepts (CCCs) and **both** the SEPs and disciplinary core ideas (DCIs).		
Developing crosscutting concepts (CCCs)	Materials **provide examples** of other instances of the CCCs or CCCs absent.	Students make connections between CCCs and **content not addressed in other units.**	In every unit, the materials lead students to **make connections between the CCCs in that unit and appearances of the CCCs in other units**.		
			Total		

Table 3: Accessibility Features

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Digital Materials	**0**	**1**	**2**	**Evidence**
All lessons within the materials are available in digital form and include a printable option.				
In every lesson, materials include recommended supports, accommodations, and modifications for Students with Disabilities and English language learners that will support their regular and active participation in accessing on grade level material (e.g., modifying vocabulary words within word problems, sentence starters, etc.).				
			Total	

Table 4: Alignment of Content

Directions:

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Conceptual Understanding: The materials support the intentional development of students' conceptual understanding of key science ideas, practice, and concepts.	**0**	**1**	**2**	**Evidence**
Bio2.LS2.1) Plan and carry out an ethology investigation of a simple organism. Gather, analyze, and present data in tabular and graphical formats. Draw conclusions based on data and communicate findings.				
Bio2.LS2.2) Compare innate versus learned behavior. Construct an argument from evidence that shows the value of both types of behavior and their importance to species survival.				

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Bio2.LS2.3) Obtain information and construct an explanation to support or oppose an adaptive advantage of social behaviors.				
Bio2.LS4.1) Use models of viruses, prokaryotes, and eukaryotes to ask questions about characteristics of living things and analyze theories regarding the origin of life on Earth. Construct an argument from evidence supporting the idea that eukaryotes could not exist on the planet if not for prokaryotes.				
Bio2.LS4.2) Using information based on the geologic time scale and history of life on Earth, look for patterns in changes in organisms over time and explain how these patterns support the theory of evolution.				
Bio2.LS4.3) Use molecular data to construct cladograms depicting phylogenetic relationships between major groups of organisms.				
Bio2.LS4.4) Trace changes in classification schemes over time, explaining these changes considering new findings and new interpretations of existing data.				
Bio2.LS4.5) Construct an argument from evidence supporting the three domain classification system or opposing the system with a suggested alternative system.				
Bio2.LS4.6) Obtain information and compare features of Bacteria and Archaea. Ask questions about the evolution of each group.				
Bio2.LS4.7) Using models, compare how the following processes occur in major groups of bacteria: gas exchange; nutrient distribution; energy acquisition and use; response to internal and external stimuli; and, reproduction.				

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Bio2.LS4.8) Construct an explanation for the evolution of eukaryotes and multicellularity based on evidence supporting the theory of endosymbiosis. Consider examples of extant organisms (viruses, bacteria, and protists) that invade host cells.				
Bio2.LS4.9) Using models, compare how the following processes occur in major groups of protists: gas exchange; nutrient distribution; energy acquisition and use; response to internal and external stimuli; and, reproduction.				
Bio2.LS4.10) Evaluate information regarding the diversity of protists. Use this information to analyze evolutionary relationships among protists, fungi, plants, and animals.				
Bio2.LS4.11) Using models, compare how the following processes occur in major groups of fungi: gas exchange; nutrient distribution; energy acquisition and use; response to internal and external stimuli; and, reproduction.				
Bio2.LS4.12) Analyze evolutionary relationships among algae and major groups of plants. In this analysis, consider adaptations necessary for survival in terrestrial habitats.				
Bio2.LS4.13) Interpret data supporting current plant classification schemes. Use a dichotomous key to identify plants based on variations in characteristics.				
Bio2.LS4.14) Obtain information and ask questions about the advantages and disadvantages of the basic plant life cycle (alternation of generations). Compare variations in this life cycle among major groups of plants.				

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Bio2.LS4.15) Use a model angiosperm to differentiate plant organs and the tissues from which they are made. Use the model to explain how the plant structures: provide support; regulate gas exchange; obtain and use energy; and, process and distribute nutrients.				
Bio2.LS4.16) Design and carry out an investigation examining the function of plant hormones.				
Bio2.LS4.17) Develop a model explaining plant tropisms at different scales (cell, tissue, organ, system). Use the model to predict how plants will respond in various environmental conditions.				
Bio2.LS4.18) Create an argument from evidence regarding the importance of plant relationships including symbiosis and co-evolutionary relationships (examples: mycorrhizae, Rhizobium, pollination, etc.).				
Bio2.LS4.19) Investigate the role of different plant types in ecosystem building and maintenance (examples: soil formation, inhibition of erosion, oxygen production, carbon sequestration, habitats).				
Bio2.LS4.20) Create a model to distinguish animal germ layers (endoderm, mesoderm, and ectoderm) and resulting tissue types. Use the model to make predictions regarding phylogenetic relationships among groups of organisms with varying body plans.				
Bio2.LS4.21) Construct an argument for the importance of embryological development in understanding relatedness (evolutionary relationships). As part of the argument, compare models of embryological development of protostomes and deuterostomes.				

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Bio2.LS4.22) Observe examples of organisms from major animal phyla in order to describe the diverse structures associated with the following functions: gas exchange; energy acquisition; nutrient processing and distribution; environmental responses; and reproduction.				
Bio2.LS4.23) Design and carry out an investigation examining how major body systems interact to maintain homeostasis of nutrient, energy, water, waste, and/or temperature balance.				
Bio2.LS4.24) Obtain and communicate information on how the nervous and endocrine systems in a model vertebrate organism coordinate body functions such as: growth and development; stimuli response and information transmission; and, the maintenance of homeostasis.				
Bio2.LS4.25) Create a model demonstrating how the immune system functions in monitoring of and responding to bacterial and viral infectious diseases.				
Bio2.LS4.26) Gather and analyze data on ectothermic and endothermic organisms and argue the advantages and disadvantages these organisms possess, considering various environments in which they live and various strategies for survival.				
Bio2.LS4.27) Model several reproductive strategies used by example organisms and compare them to explain how each differentially accomplishes reproductive success. Collect information in support of the argument that rapidly reproducing species that produce more young are more resilient.				

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Bio2.LS4.28) Evaluate scientific data collected from multiple sources to trace animal evolution.				
Bio2.ETS2.1) Research the development of the microscope and advances in microscopy technology for the discovery and ongoing understanding of microorganisms.				
Bio2.ETS2.2) Construct an explanation for how classification schemes have changed based on new evidence gained due to advances in biotechnology.				
Bio2.ETS2.3) Create a timeline depicting how humans have employed engineering and technology to maximize use of microorganisms, plants, and animals for various purposes. Choose one specific example and construct an argument supporting or opposing the use of engineering or technology in this instance.				
Total				