**STEMscopes Virginia-Grade Five**

Overall Rating of Standards

| **Standard** | **Determined Rating** |
| --- | --- |
| 5.1 The student will demonstrate an understanding of the scientific and engineering practices. | This standard was evaluated in the context of the content standards. |
| 5.2 The student will investigate and understand that energy can take many forms.  | Adequate |
| 5.3 The student will investigate and understand that there is a relationship between force and energy of moving objects. | Adequate |
| 5.4 The student will investigate and understand that electricity is transmitted and used in daily life. | Adequate |
| 5.5 The student will investigate and understand that sound can be produced and transmitted. | Adequate |
| 5.6 The student will investigate and understand that visible light has certain characteristics and behaves in predictable ways. | Adequate |
| 5.7 The student will investigate and understand that matter has properties and interactions. | Adequate |
| 5.8 The student will investigate and understand that Earth constantly changes. | Adequate |
| 5.9 The student will investigate and understand that the conservation of energy resources is important.  | Adequate |

Overall Rating for Instructional Design and Support

| **Instructional Design and Support** | **Determined Rating** |
| --- | --- |
| Materials emphasize the use of effective instructional practices and learning theory. | Adequate |
| The science content is significant and accurate. | Adequate |
| Materials present content in an accurate, unbiased manner. | Adequate |

Review of Standards with Curriculum Framework

| Standard | Expectation |
| --- | --- |
| 5.1 The student will demonstrate an understanding of the scientific and engineering practices by:1. asking questions and defining problems
2. planning and carrying out investigations
3. interpreting, analyzing, and evaluating data
4. constructing and critiquing conclusions and explanations
5. developing and using models
6. obtaining, evaluating, and communicating information.
 | The expectation of the 2018 *Science Standards of Learning* is that the scientific and engineering practices are embedded into the instruction of content standards.  The rating for an individual standard includes the evaluation of standard 1 as it pertained to that standard.  For specific grade level/course expectations for standard 1, see the Standards of Learning and the Curriculum Framework.  |

| Standard | Adequate | Limited | No Evidence |
| --- | --- | --- | --- |
| 5.2 The student will investigate and understand that energy can take many forms. Key ideas include |  |  |  |
| 1. energy is the ability to do work or to cause change;
 | X |  |  |
| 1. there are many different forms of energy;
 | X |  |  |
| 1. energy can be transformed; and
 | X |  |  |
| 1. energy is conserved.
 | X |  |  |

| Standard | Adequate | Limited | No Evidence |
| --- | --- | --- | --- |
| 5.3 The student will investigate and understand that there is a relationship between force and energy of moving objects. Key ideas include |  |  |  |
| 1. moving objects have kinetic energy;
 | X |  |  |
| 1. motion is described by an object’s direction and speed;
 | X |  |  |
| 1. changes in motion are related to net force and mass;
 | X |  |  |
| 1. when objects collide, the contact forces transfer energy and can change objects’ motion; and
 | X |  |  |
| 1. friction is a force that opposes motion.
 | X |  |  |

| Standard | Adequate | Limited | No Evidence |
| --- | --- | --- | --- |
| 5.4 The student will investigate and understand that electricity is transmitted and used in daily life. Key ideas include |  |  |  |
| 1. electricity flows easily through conductors but not insulators;
 | X |  |  |
| 1. electricity flows through closed circuits;
 | X |  |  |
| 1. static electricity can be generated by rubbing certain materials together;
 | X |  |  |
| 1. electrical energy can be transformed into radiant, mechanical, and thermal energy; and
 | X |  |  |
| 1. a current flowing through a wire creates a magnetic field.
 | X |  |  |

| Standard | Adequate | Limited | No Evidence |
| --- | --- | --- | --- |
| 5.5 The student will investigate and understand that sound can be produced and transmitted. Key ideas include |  |  |  |
| 1. sound is produced when an object or substance vibrates;
 | X |  |  |
| 1. sound is the transfer of energy;
 | X |  |  |
| 1. different media transmit sound differently; and
 | X |  |  |
| 1. sound waves have many uses and applications.
 | X |  |  |

| Standard | Adequate | Limited | No Evidence |
| --- | --- | --- | --- |
| 5.6 The student will investigate and understand that visible light has certain characteristics and behaves in predictable ways. Key ideas include |  |  |  |
| 1. visible light is radiant energy that moves in transverse waves;
 | X |  |  |
| 1. the visible spectrum includes light with different wavelengths;
 | X |  |  |
| 1. matter influences the path of light; and
 | X |  |  |
| 1. radiant energy can be transformed into thermal, mechanical, and electrical energy.
 | X |  |  |

| Standard | Adequate | Limited | No Evidence |
| --- | --- | --- | --- |
| 5.7 The student will investigate and understand that matter has properties and interactions. Key ideas include |  |  |  |
| 1. matter is composed of atoms;
 | X |  |  |
| 1. substances can be mixed together without changes in their physical properties; and
 | X |  |  |
| 1. energy has an effect on the phases of matter.
 | X |  |  |

| Standard | Adequate | Limited | No Evidence |
| --- | --- | --- | --- |
| 5.8 The student will investigate and understand that Earth constantly changes. Key ideas include |  |  |  |
| 1. Earth’s internal energy causes movement of material within the Earth;
 |  | X |  |
| 1. plate tectonics describe movement of the crust;
 | X |  |  |
| 1. the rock cycle models the transformation of rocks;
 | X |  |  |
| 1. processes such as weathering, erosion, and deposition change the surface of the Earth; and
 | X |  |  |
| 1. fossils and geologic patterns provide evidence of Earth’s change.
 | X |  |  |

| Standard | Adequate | Limited | No Evidence |
| --- | --- | --- | --- |
| 5.9 The student will investigate and understand that the conservation of energy resources is important. Key ideas include |  |  |  |
| 1. some sources of energy are considered renewable and others are not;
 | X |  |  |
| 1. individuals and communities have means of conserving both energy and matter; and
 | X |  |  |
| 1. advances in technology improve the ability to transfer and transform energy.
 |  | X |  |

Rubric for Instructional Design and Support

|  |  |  |
| --- | --- | --- |
| **Adequate** | **Limited** | **No Evidence** |
| 1. Materials emphasize the use of effective instructional practices and learning theory.
 |
| * 1. Students are guided through critical thinking and problem-solving approaches.
 |
| Materials consistently include content promoting use of critical thinking and problem-solving approaches. | Materials inconsistently include content promoting use of critical thinking and problem-solving approaches. | Materials do not include content promoting use of critical thinking and problem-solving approaches. |
| * 1. Concepts are introduced through concrete experiences that incorporate the scientific and engineering practices.
 |
| Materials consistently promote the introduction of concepts through concrete experiences. | Materials inconsistently promote the introduction of concepts through concrete experiences. | Materials do not promote the introduction of concepts through concrete experiences. |
| * 1. Multiple opportunities are provided for students to develop and apply concepts through scientific and engineering practices.
 |
| Materials consistently provide development and application of concepts through appropriate technologies. | Materials inconsistently provide development and application of concepts through appropriate technologies. | Materials do not provide development and application of concepts through appropriate technologies. |
| * 1. Students use a variety of representations (graphical, numerical, symbolic, verbal, and physical) to connect science concepts.
 |
| Materials provide consistent use of a variety of representations of science content and concepts.  | Materials provide inconsistent use of a variety of representations of science content and concepts. | Materials do not provide use of a variety of representations of science content and concepts. |
| 1. The science content is significant and accurate.
 |
| * 1. Materials are presented in an organized, logical manner which represents the current thinking on how students learn science.
 |
| Materials consistently support the balanced use of conceptual and procedural approaches. | Materials inconsistently support the balanced use of conceptual and procedural approaches. | Materials do not support a balanced use of conceptual and procedural approaches. |
| * 1. Materials are organized appropriately within and among units of study.
 |
| Materials are consistently organized within and among units of study.  | Materials are inconsistently organized within and among units of study. | Materials are inappropriately organized within and among units of study. |
| * 1. Format design includes titles, subheadings, and appropriate cross-referencing for ease of use.
 |
| Materials consistently use formatting that is user-friendly. | Materials inconsistently use formatting that is user-friendly. | Materials do not use formatting that is user-friendly. |
| * 1. Writing style, length of sentences, vocabulary, graphics, and illustrations are appropriate.
 |
| Materials consistently include writing and visuals that are appropriate for the grade level. | Materials inconsistently include writing and visuals that are appropriate for the grade level. | Materials do not include writing and visuals that are appropriate for the grade level. |
| * 1. Level of abstraction is appropriate, and practical/real-life examples, including careers, are provided.
 |
| Materials consistently provide the appropriate level of abstraction and appropriate practical/real-life examples.  | Materials inconsistently provide the appropriate level of abstraction and appropriate practical/real-life examples. | Materials do not provide the appropriate level of abstraction and appropriate practical/real-life examples. |
| * 1. Sufficient applications are provided to promote depth of application.
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| Materials consistently provide sufficient applications to promote depth of application and are appropriate for the grade level. | Materials inconsistently provide sufficient applications to promote depth of application and are appropriate for the grade level. | Materials do not provide sufficient applications to promote depth of application and are not appropriate for the grade level. |
| 1. Materials present content in an accurate, unbiased manner.
 |
| Materials consistently present content in an accurate, unbiased manner. | Materials inconsistently present content in an accurate, unbiased manner. | Materials do not present content in an accurate, unbiased manner. |