**STEMscopes Virginia-Physical Science**

Overall Rating of Standards

| **Standard** | **Determined Rating** |
| --- | --- |
| PS.1 The student will demonstrate an understanding of the scientific and engineering practices. | This standard was evaluated in the context of the content standards. |
| PS.2 The student will investigate and understand that matter is composed of atoms. | Adequate |
| PS.3 The student will investigate and understand that matter has properties and is conserved in chemical and physical processes. | Adequate |
| PS.4 The student will investigate and understand that the periodic table is a model used to organize elements based on their atomic structure. | Adequate |
| PS.5 The student will investigate and understand that energy is conserved. | Adequate |
| PS.6 The student will investigate and understand that waves are important in the movement of energy. | Adequate |
| PS.7 The student will investigate and understand that electromagnetic radiation has characteristics. | Adequate |
| PS.8 The student will investigate and understand that work, force, and motion are related. | Adequate |
| PS.9 The student will investigate and understand that there are basic principles of electricity and magnetism. | Adequate |

Overall 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 |
| --- | --- |
| PS.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 |
| --- | --- | --- | --- |
| PS.2 The student will investigate and understand that matter is composed of atoms. Key ideas include |  |  |  |
| 1. our understanding of atoms has developed over time; | X |  |  |
| 1. the periodic table can be used to predict the chemical and physical properties of matter; and | X |  |  |
| 1. the kinetic molecular theory is used to predict and explain matter interactions. | X |  |  |

| Standard | Adequate | Limited | No Evidence |
| --- | --- | --- | --- |
| PS.3 The student will investigate and understand that matter has properties and is conserved in chemical and physical processes. Key ideas include |  |  |  |
| 1. pure substances can be identified based on their chemical and physical properties; | X |  |  |
| 1. pure substances can undergo physical and chemical changes that may result in a change of properties; | X |  |  |
| 1. compounds form through ionic and covalent bonding; and | X |  |  |
| 1. balanced chemical equations model the conservation of matter. | X |  |  |

| Standard | Adequate | Limited | No Evidence |
| --- | --- | --- | --- |
| PS.4 The student will investigate and understand that the periodic table is a model used to organize elements based on their atomic structure. Key uses include |  |  |  |
| 1. symbols, atomic numbers, atomic mass, chemical groups (families), and periods are identified on the periodic table; and | X |  |  |
| 1. elements are classified as metals, metalloids, and nonmetals. | X |  |  |

| Standard | Adequate | Limited | No Evidence |
| --- | --- | --- | --- |
| PS.5 The student will investigate and understand that energy is conserved. Key ideas include |  |  |  |
| 1. energy can be stored in different ways; | X |  |  |
| 1. energy is transferred and transformed; and | X |  |  |
| 1. energy can be transformed to meet societal needs. | X |  |  |

| Standard | Adequate | Limited | No Evidence |
| --- | --- | --- | --- |
| PS.6 The student will investigate and understand that waves are important in the movement of energy. Key ideas include |  |  |  |
| 1. energy may be transferred in the form of longitudinal and transverse waves; | X |  |  |
| 1. mechanical waves need a medium to transfer energy; | X |  |  |
| 1. waves can interact; and | X |  |  |
| 1. energy associated with waves has many applications. | X |  |  |

| Standard | Adequate | Limited | No Evidence |
| --- | --- | --- | --- |
| PS.7 The student will investigate and understand that electromagnetic radiation has characteristics. Key ideas include |  |  |  |
| 1. electromagnetic radiation, including visible light, has wave characteristics and behavior; and | X |  |  |
| 1. regions of the electromagnetic spectrum have specific characteristics and uses. | X |  |  |

| Standard | Adequate | Limited | No Evidence |
| --- | --- | --- | --- |
| PS.8 The student will investigate and understand that work, force, and motion are related. Key ideas include |  |  |  |
| 1. motion can be described using position and time; and | X |  |  |
| 1. motion is described by Newton’s laws. | X |  |  |

| Standard | Adequate | Limited | No Evidence |
| --- | --- | --- | --- |
| PS.9 The student will investigate and understand that there are basic principles of electricity and magnetism. Key ideas include |  |  |  |
| 1. an imbalance of charge generates static electricity; | X |  |  |
| 1. materials have different conductive properties; | X |  |  |
| 1. electric circuits transfer energy; | X |  |  |
| 1. magnetic fields cause the magnetic effects of certain materials; | X |  |  |
| 1. electric current and magnetic fields are related; and | X |  |  |
| 1. many technologies use electricity and magnetism. | X |  |  |

Rubric for Instructional Design and Support

|  |  |  |
| --- | --- | --- |
| **Adequate**  (Note: Provide examples to support this rating.) | **Limited**  (Note: Provide examples to support this rating.) | **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. | | |
| 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. |