

## PA Core Standards: Science

### Introduction

The 2020–21 school year presents a unique set of opportunities and challenges due to the disruption to instruction in spring 2020 as well as the uncertainty as the school year unfolds. Educators know that every school year there are students who require support in addressing unfinished learning from prior grades; a challenge that will be felt more prominently in the 2020–21 school year. It is vitally important that educators are supported to make deliberate instructional choices that allow all students to effectively engage with grade-level work.

The most effective and equitable way to support students in their learning is to ensure that the vast majority of time is spent engaging with grade-level content and accelerating as needed. It is entirely possible to hold high expectations for all students while addressing unfinished learning in the context of grade-level work. Since time is a scarce commodity in classrooms — made more limited by anticipated closures and remote or hybrid learning models in the fall of 2020 — strategic instructional choices about which content to prioritize must be made.<sup>1</sup>

Assessing students at the start of the year will identify learning gaps and provide data to inform instruction. Diagnostic Assessments determine student strengths, weaknesses, knowledge, and skills. Administering diagnostic assessments permits the instructor to intervene at the point where students begin to struggle or when they are performing below grade level expectations (running record, Classroom Diagnostic Tests [CDT]). Diagnostic assessments allow teachers to adjust the curriculum to meet the unique needs of all students. While some concepts have greater emphasis in a particular year, all standards deserve a defined level of instruction. Neglecting concepts may result in learning gaps in student skill and understanding and may leave students unprepared for the challenges of a later grade.

This guidance document is designed to identify and define areas of high-level focus in Science instruction supported by key PA Academic Standards. Note that while all standards deserve a defined level of instruction, neglecting key concepts may result in learning gaps in student skill and understanding and may leave students unprepared for the challenges of a later grade. Not all content in a given grade is emphasized equally in the standards. Some focus areas require greater emphasis than others based on the depth of the ideas, the time taken to master, and/or their importance to the future science grade levels. More time in these areas is also necessary for students to meet the Standards for Inquiry and Design and Unifying Themes.

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<sup>1</sup> Adapted from 2020–21 Priority Instructional Content in English Language Arts/literacy and Mathematics, Student Achievement Partners/Achieve the Core. May 2020

## GRADE 6 – 8 FOCUS OF INSTRUCTION (2020-2021)

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Focus Areas of Instruction	PA Academic Standards
<p><b>Life Science</b></p> <ul style="list-style-type: none"> <li>• Use evidence of characteristics of life to differentiate between living and nonliving things.</li> <li>• Create and use models to describe the basic structures and functions of cells within a system framework.</li> <li>• Provide evidence to support the concept of an organism is composed of interacting subsystems composed of a group of cells.</li> <li>• Describe and distinguish between various types of reproductive methods of cells and organisms.</li> <li>• Provide a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.</li> <li>• Create a scientific, evidence-based explanation of the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.</li> <li>• Create a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.</li> <li>• Design and/or construct a model to describe the cycling of matter and flow of energy and within the biotic and abiotic parts of an ecosystem.</li> <li>• Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past.</li> <li>• Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.</li> <li>• Construct and utilize dichotomous keys to identify organisms.</li> <li>• Use a model that distinguishes how genetic information is conserved during asexual reproduction while sexual reproduction results in variation.</li> <li>• Provide an explanation for the relationship among changes (mutations) to genes, changes to the formation of proteins, and the effect on the structure and function of the organism and thereby traits.</li> </ul>	<p><b>3.1.7.A</b> <i>Explain the parts of a simple system and their relationship to each other.</i></p> <p><b>3.1.7.B</b> <i>Describe the use of models as an application of scientific or technological concepts.</i></p> <p><b>3.1.7.C</b> <i>Identify patterns as repeated processes or recurring elements in science and technology.</i></p> <p><b>3.1.7.D</b> <i>Explain scale as a way of relating concepts and ideas to one another by some measure.</i></p> <p><b>3.1.7.E</b> <i>Identify change as a variable in describing natural and physical systems.</i></p> <p><b>3.2.7.A</b> <i>Explain and apply scientific and technological knowledge.</i></p> <p><b>3.2.7.B</b> <i>Apply process knowledge to make and interpret observations.</i></p> <p><b>3.2.7.C</b> <i>Identify and use the elements of scientific inquiry to solve problems.</i></p> <p><b>3.3.7.A</b> <i>Describe the similarities and differences that characterize diverse living things.</i></p> <p><b>3.3.7.B</b> <i>Describe the cell as the basic structural and functional unit of living things.</i></p> <p><b>3.3.7.C</b> <i>Know that every organism has a set of genetic instructions that determines its inherited traits.</i></p> <p><b>3.3.7.D</b> <i>Explain basic concepts of natural selection.</i></p> <p><b>3.7.7.A</b> <i>Describe the safe and appropriate use of tools, materials, and techniques to answer questions and solve problems.</i></p>