

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 associated with what the “return to school” will look like. 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.¹

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 areas of focus in science instruction, grade by grade. Each grade level guidance document defines high level focus of 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.

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

GRADE 1 FOCUS OF INSTRUCTION (2020-2021)

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 skill and understanding and may leave students unprepared for the challenges of later grades.

Focus Areas of Instruction	PA Academic Standards
<p>Life Science</p> <ul style="list-style-type: none"> • Make observations and describe the different parts of organisms that help them survive, grow, and meet their needs. • Design a model that replicates the function of an organism’s structure. • Classify plants and animals according to physical characteristics they share. • Make observations and to construct an evidence-based account that young plants and animals are alike but not exactly like their parents. • Conduct an investigation (e.g. plant seeds, eggs) and cite evidence of change from young to adult. • Observe and compare the stages of life cycles of organisms (plants & animals). 	<p>3.1.4.A Know that natural and human-made objects are made up of parts. 3.2.4.A Identify and use the nature of scientific and technological knowledge. 3.2.4.B Describe objects in the world using the five senses. 3.2.4.C Recognize and use the elements of scientific inquiry to solve problems. 3.2.4.D Recognize and use the technological design process to solve problems. 3.3.4.A Know the similarities and differences of living things. 3.3.4.B Know that living things are made up of parts that have specific functions. 3.3.4.C Know that characteristics are inherited and, thus, offspring closely resemble their parents.</p>
<p>Physical Science</p> <ul style="list-style-type: none"> • Plan and conduct investigations to provide evidence that vibrating materials can make sound. • Investigate and explain that for an object to be seen, light must be reflected off the object and enter the eye. • Make observations to construct an evidence-based account that light travels from place to place. • Plan and conduct an investigation to redirect light beams using mirrors. • Investigate to determine the effect of placing objects made of different materials in a beam of light. • Make observations to construct an evidence-based account that objects can be seen when illuminated. • Use tools and materials to design a device that uses light or sound to solve the problem of communicating over a distance. 	<p>3.2.4.A Identify and use the nature of scientific and technological knowledge. 3.2.4.B Describe objects in the world using the five senses. 3.2.4.C Recognize and use the elements of scientific inquiry to solve problems. 3.2.4.D Recognize and use the technological design process to solve problems. 3.2.4.B Describe objects in the world using the five senses. 3.2.4.C Recognize and use the elements of scientific inquiry to solve problems. 3.4.4.B Know basic energy types, sources, and conversions. 3.4.4.C Observe and describe different types of force and motion.</p>
<p>Earth and Space Science</p> <ul style="list-style-type: none"> • Use observations of stars, moon, and sun in the day and night sky to describe patterns that can be predicted. • Observe and describe patterns of objects in the sky that are cyclic and can be predicted. • Develop a model to represent the shapes and kinds of land and bodies of water in an area. • Organize simple weather data sets to record local weather data and identify day-to-day variations, as well as long-term patterns of weather. 	<p>3.1.4.C Illustrate patterns that regularly occur and reoccur in nature. 3.1.4.A Know that natural and human-made objects are made up of parts. 3.2.4.A Identify and use the nature of scientific and technological knowledge. 3.2.4.B Recognize and use the technological design process to solve problems. 3.2.4.C Recognize and use the elements of scientific inquiry to solve problems. 3.4.4.D Describe the composition and structure of the universe and the earth’s place in it. 3.5.4.C Know basic weather elements.</p>