

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.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 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.

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

GRADE K FOCUS OF INSTRUCTION (2020-2021)

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Focus Areas of Instruction	PA Academic Standards
<p>Life Science</p> <ul style="list-style-type: none"> • Use observations to describe what plants and animals need to survive. • Use a model to explain the relationship between the needs of different plants or animals and the places they live. • Observe and describe structures of organisms and functions of the structures. 	<p>3.1.4.A <i>Know that natural and human-made objects are made up of parts.</i> 3.1.4.B <i>Know models as useful simplifications of objects or processes.</i> 3.1.4.C <i>Illustrate patterns that regularly occur and reoccur in nature.</i> 3.2.4.A <i>Identify and use the nature of scientific and technological knowledge.</i> 3.2.4.B <i>Describe objects in the world using the five senses.</i> 3.3.4.A <i>Know the similarities and differences of living things.</i> 3.3.4.B <i>Know that living things are made up of parts that have specific functions.</i></p>
<p>Physical Science</p> <ul style="list-style-type: none"> • Analyze data from testing objects made from different materials to determine if a proposed object functions as intended. • Design an object built from a small set of pieces to solve a problem and compare solutions designed by peers given the same set of pieces. • Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object. • Analyze data to determine if a design solution works as intended to change the direction or speed of an object with a push or a pull. • Plan and conduct a simple test to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object. 	<p>3.1.4.A <i>Know that natural and human-made objects are made up of parts.</i> 3.2.4.A <i>Identify and use the nature of scientific and technological knowledge.</i> 3.2.4.C <i>Recognize and use the elements of scientific inquiry to solve problems.</i> 3.2.4.D <i>Recognize and use the technological design process to solve problems.</i> 3.4.4.A <i>Recognize basic concepts about the structure and properties of matter.</i> 3.4.4.C <i>Observe and describe different types of force and motion.</i></p>
<p>Earth and Space Science</p> <ul style="list-style-type: none"> • Use and share observations of local weather conditions to describe patterns over time. • Make observations to determine the effect of sunlight on the Earth's surface. • Use tools and materials to design and build a structure that will reduce (or increase) the warming effect of sunlight on an area. • Ask questions to obtain information about the purpose of weather forecasting to prepare for and respond to weather. • Use evidence to show how plants and animals are able to change their environment to meet their needs. • Describe and communicate solutions to reduce impact of humans on land, water, and air. 	<p>3.1.4.C <i>Illustrate patterns that regularly occur and reoccur in nature.</i> 3.2.4.B <i>Describe objects in the world using the five senses.</i> 3.2.4.C <i>Recognize and use the elements of scientific inquiry to solve problems.</i> 3.2.4.D <i>Recognize and use the technological design process to solve problems.</i> 3.5.4.C <i>Know basic weather elements.</i> 3.4.4.B <i>Know basic energy types, sources and conversions.</i></p>