pennsylvania
DEPARTMENT OF EDUCATION

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 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 then 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 4 FOCUS OF INSTRUCTION (2020-2021)

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Focus Areas of Instruction	Focus Areas of Instruction
Life Science • Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. **Physical Science** • Investigate the forces between two or more magnets to identify patterns. • Design and refine solutions to a problem by using magnets to move objects not in contact with one another. • Investigate and describe conductors and insulators. • Construct serial and parallel circuits and describe the path of electrons in the circuit. • Demonstrate and explain open and closed circuits utilizing switches • Construct an electromagnet and plan an investigation to determine how one can make the electromagnet stronger or weaker. • Demonstrate the energy transfer between two objects using a magnet and another object. • Carry out investigations to provide evidence that energy is transferred from place to place by sound, light, heat, electric currents, interacting magnets, and moving or colliding objects. • Construct an explanation for the relationship between energy and motion. **Earth and Space Science** • Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time. • Make observations and measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation (heating cooling, volume of water, speed of wind, deposition, slope, angles, etc.). • Analyze and interpret data from maps to describe patterns of Earth's features. • Identify various types of water environments in Pennsylvania. • Use fossils as evidence to infer that some rocks were formed from the remains of once living organisms. • Use evidence from patterns in rock formations and fossils in rock layers to support the explanation for a change in landforms and environments over time.	**3.3.4.C** *Know that characteristics are inherited and, thus, offspring closely resemble their parents.* **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.* **3.1.4.B** *Know models as useful simplifications of objects or processes.* **3.5.4.A** *Know basic landforms and earth history.* **3.5.4.D** *Recognize the earth's different water resources.*