Science Graduation Guidance

High School Science

Credits

Options in Course Sequences

The graduation requirements outlined by the Kansas Department of Education state that students should earn three credits in the areas of science that include concepts of Life Science, Physical Science and Earth/Space Science. The intent is that all the standards in these areas are mapped to courses at the local level, however, *KSDE does not dictate which courses are required*. We recognize that student choice and agency is important and such intend for the below to only serve as guidance while making decisions at the local level.

Quick Links

- Physics
- Chemistry
- Biology

Life Science- The standards are commonly mapped to the area of life science at the intro level and are commonly associated with the course called "**Biology**" with course code **03051.**

Physical Science- The standards for this area are commonly mapped into intro level courses called "**Physical Science**" with course code **03159** or "Physics" with a course code of **03151 and** "**Chemistry**" with a course code of **03101.** If a student takes only Chemistry **or** Physics, they are likely missing some of the state standards.

Earth and Space Science- The standards for this area are commonly mapped into intro level courses called "**Earth Science**" with course code **03001**. While many courses might match the Earth and Space Science topics, it is important that the standards are reflected in the introduction level courses. For example, a course such as Astronomy 03004, would also need to include the topics of atmospheric science.

Historical Arrangement

While the arrangement above is an option for implementing the state standards, KSDE Science recognizes that the recommended courses vary greatly across the state. Historically across the nation a sequence including the Physics, Biology, and Chemistry has been identified as the most common. For this reason the outlined scope and sequence below utilizes this sequence and incorporates the Earth and Space standards into discipline courses where it best aligns.

Life Science (Biology)

Structures and Processes of Life	Natural Selection
HS-LS1-1 HS-LS1-2 HS-LS1-3 HS-LS1-4 HS-LS3-1 HS-LS3- 2	HS-ESS2-7 HS-LS3-3 HS-LS4-5 HS-LS4-1 HS-LS4-2 HS-LS4-3 HS-LS4-4 HS-LS2-8
Ecosystems	**BioDiversity**
HS-LS2-1 HS-LS2-4 HS-LS2-6	HS-LS2-2 HS-LS2-7 HS-LS4-6 HS-ESS2-2 HS-ESS3-3 HS-ESS3-2

Physical Science or Physics

1 Dimensional Motion HS-PS2-1 HS-PS2-2 HS-PS2-3 Gravity and orbits HS-PS2-4 HS-ESS1-4 HS-ESS1-6 Earth's Surface & Interior Processes HS-ESS2-3 HS-ESS2-1 HS-ESS1-5 Energy Conversion HS-PS3-2 HS-PS3-3	Electricity & Magnetism HS-PS2-5 HS-PS3-5 Climate Change HS-PS3-1 HS-ESS2-4 HS-ESS3-1 HS-ESS3-4 HS-ESS3-5 HS-ESS3-6 Electromagnetic Radiation & Technology HS-PS4-1 HS-PS4-2 HS-PS4-3 HS-PS4-4 HS-PS4-5

Note: The NGSS physical science standards and the standards include clear assessment boundaries that support physics for all students. For example, most standards are limited to 1-dimensional motion, basic algebraic expressions, computations, and manipulations, and simple systems.

Many school systems use "physics" as an advanced science course that goes beyond the expectations of the NGSS standards. If physics is considered an advanced science course and goes beyond the expectations of the NGSS, this course recommendation could be used in a "physical science" class.

Chemistry

Periodic Table and Bonding HS-PS1-1 HS-PS1-2 Intermolecular Forces HS-PS1-3 HS-PS2-6 HS-ESS2-5 Chemical Reactions and Bond Energy HS-PS1-4 HS-LS1-7 HS-LS1-5 HS-LS2-3	Cycling & Conservation of Matter HS-PS1-7 HS-LS1-6 HS-LS2-5 HS-ESS2-6 Kinetics & Equilibrium HS-PS1-6 HS-PS1-5 HS-PS3-4 Nuclear Energy HS-ESS1-2 HS-ESS1-1 HS-ESS1-3 HS-PS1-8

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