

Science Curriculum

(revised 2014-2015 school year)

I. Introduction

A. Foundational statements key to all curriculum strands include the school's:

1. philosophy of education, as articulated in the CSI publication *The Beginning of Wisdom*;
2. statement of purpose;
3. principles of instruction;
4. mission statement.

B. The purpose of teaching science at Sioux Center Christian School is to explore the depth and breadth of creation in ways that lead to: a deepened understanding of its wonders, a sense of awe for the Creator, and a desire to be responsible stewards of earth's resources.

C. The science curriculum should be integrated into other subject areas whenever possible for it to be the most beneficial to students.

II. Biblical Truths Related to Science

God has revealed Himself through the Bible and through His creation. Science is a gift from God that allows us to stand in awe of Him for the wondrous way that He alone created our world. Our Lord did not create a chaotic world; rather, creation is a structured unity sustained by God's unchangeable laws. Through science, we can more fully understand the complexity and order of God's world.

We believe that God created the world, not by chance, but by an intentional act of His power. Today He continues to uphold and govern His creation. We come to know God by studying science: His infinity in the countless stars, His power in the storm and the volcano, His precision in the microscopic organisms, and His wisdom in the balance of nature. Truly, "the heavens declare the glory of God" (Psalm 19:1). Through the study of science, our students will grow in their knowledge and adoration of the Creator.

Although God's original creation was perfect, every part has been affected by sin (Genesis 3:17, Romans 8:22). When God placed people on His earth, He commanded them to rule the earth (Genesis 1:28--Cultural Mandate, Psalm 8:6). But people have

used creation to serve themselves, furthering the harmful effects of sin. The Lord expects His people to be good stewards of His creation. Using science responsibly, we commit at Sioux Center Christian School to honoring God by caring for and developing His world.

III. Philosophy for Teaching Science

On one hand, science is a body of knowledge. As teachers, one of our tasks is to ensure that our students have an accurate understanding of the world they live in. From the smallest scale of spinning protons and electrons to the grand, sweeping swirl of galaxies, we want our students to comprehend the complexities of animal, vegetable, mineral, and human created components to this divinely proportioned universe.

On the other hand, science must also be seen as a process. Science is, after all, what scientists “do.” As teachers guide students in exploring and discovering the creation around them, they must teach skills of observation, measurement, classification, comparison, description, and data analysis. Science becomes the set of tools students and teachers use as they uncover the wonders of the Creation. Science leads us to discovery that helps us link isolated facts to comprehensive understandings, always pointing toward to glory of God.

Science then is also a set of attitudes. Students come to school with an innate curiosity about the world around them, and teachers must foster this. Taught from this mindset, science instruction is ongoing, useful, exciting, and relevant.

At Sioux Center Christian School, science instruction means teaching a body of knowledge (science content) by way of engaging students in the processes of “doing” science from a perspective of curiosity and scientific exploration.

IV. Science Standards for K-8 Students

Sioux Center Christian School aligns to certain Next Generation Science Standards (NGSS)—those that align with our perspective and mission statement. These standards inform our content and performance expectations in each grade level and are located in our scope and sequence.

As a school, SCCS adopts the following overarching anchor standards for science. These standards guide our instruction in all grade levels.

1. Students will approach science as a way of conducting inquiry into the nature, order, and composition of Creation. (science as inquiry standard)
2. Students will explore the created order of living things in order to deepen their understanding and apply their acquired knowledge in ways that show discernment. (life science standard)
3. Students will explore the created structure and processes of the earth and the cosmos in order to deepen their understanding and apply their acquired knowledge in ways that show discernment. (earth and space science standard)
4. Students will explore the created properties of matter and energy in order to deepen their understanding and apply their acquired knowledge in ways that show discernment. (physical science standard)
5. Students will learn about problems, make solutions and tools to solve the problems, try out the solutions and tools, analyze data, and then compare the solutions and tools. (engineering, technology, and applications of science standard)
6. Students will understand our need to respond individually and communally to God's command to care for ourselves and our world, including health and safety, natural resources, and the environment.

Aligning to the NGSS also means focusing on the three dimensions of the NGSS at each grade level:

Dimension 1: Science and Engineering Practices

The practices describe behaviors that scientists engage in as they investigate and build models and theories about the natural world and the key set of engineering practices that engineers use as they design and build models and systems. Engaging in scientific investigation requires not only skill but also knowledge that is specific to each practice. Although engineering design is similar to scientific inquiry, there are significant differences. For example, scientific inquiry involves the formulation of a question that can be answered through investigation, while engineering design involves the formulation of a problem that can be solved through design. There are 8 practices included:

1. Asking questions (for science) and defining problems (for engineering)
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

Students in grades K-8 should engage in all eight practices over each grade band. Practices grow in complexity and sophistication across the grades. Each practice may reflect science or engineering. **Practices represent what students are expected to do, and are not teaching methods or curriculum.** The eight practices are not separate; they intentionally overlap and interconnect.

Dimension 2: Crosscutting Concepts

Crosscutting concepts have application across all domains of science. As such, they are a way of linking the different domains of science. They include:

- patterns, similarity, and diversity;
- cause and effect;
- scale, proportion, and quantity;
- systems and system models;
- energy and matter;
- structure and function; and
- stability and change.

These concepts provide an organizational schema for interrelating knowledge from various science fields and the wonder of God's creation. They include a way of approaching a subject and also teaching strategies. Think of them as guiding concepts when focusing on essential questions or understandings.

Dimension 3: Disciplinary Core Ideas

Disciplinary core ideas have been written with age appropriateness, international benchmarking, key ideas, and focus in mind. To be considered core, the ideas meet at least two of the following criteria and ideally all four:

- Have **broad importance** across multiple sciences or engineering disciplines or be a **key organizing concept** of a single discipline;
- Provide a **key tool** for understanding or investigating more complex ideas and solving problems;
- Relate to the **interests and life experiences of students** or be connected to **societal or personal concerns** that require scientific or technological knowledge;
- Be **teachable** and **learnable** over multiple grades at increasing levels of depth and sophistication.

Disciplinary core ideas are grouped in four domains:

- physical science;
- life science;
- earth and space science;
- and engineering, technology, and applications of science.

It's important to note that the Next Generation Science Standards are student performance expectations – NOT curriculum. The NGSS are also aligned to Common Core literacy and math standards.