

Preparing Students for a Lifetime of Success

Understanding New
Science Standards
for Grades 3-5

How will we prepare students for academic success?

Our state has adopted new standards based on the *Framework for K-12 Science Education* because we understand that a robust science education in elementary school will pave the way for increased opportunities in middle school, high school, and college.

The Tennessee Academic Standards for Science enable our teachers to offer all students interactive science instruction that promotes analysis and interpretation of data, critical thinking, problem solving, and connections across science disciplines—with a high set of expectations for achievement in grades 3–5.

A quality science education can help expand opportunities for all our students.

These science standards complement our English/Language Arts and mathematics standards, enabling classroom instruction to reflect a clearer picture of the real world, where solving problems often requires skills and knowledge from multiple disciplines. Further, these standards are designed to benefit and engage all students, whether they currently lack access to a quality science education or already excel in science subjects.



What is our vision for science education?

Tennessee's standards reflect the latest research and advances in modern science. In order to equip students to think critically, analyze information, and solve complex problems, the standards are arranged such that—from elementary through high school—students have multiple opportunities to build on the knowledge and skills gained during each grade, by revisiting important concepts and expanding their understanding of connections across scientific domains. Parents should understand that while some content might be similar to the past, it may look different from how they were taught.

As the current science standards are implemented in schools and districts, they will enable students to:

- Develop a deeper understanding of science beyond memorizing facts, and
- Experience similar scientific and engineering practices as those used by professionals in the field.

How will students learn science in the classroom?

Each year, students in Knox County should be able to demonstrate greater capacity for connecting knowledge across, and between, the physical sciences, life sciences, earth and space sciences, and engineering design.

During grades 3–5, your child will begin to form deeper connections between concepts and skills previously learned in grades K–2, such as evaluating methods for collecting data, revising models based on evidence, and analyzing data to make sense of phenomena.

Upon completion of grades 3–5, your child should have a deeper understanding of:

- The effects of chemical reactions, forces, and energy on the world around us;
- The ways different organisms and the environment interact;
- The ways the geosphere, biosphere, and hydrosphere interact; and
- How engineering design can be a regular part of problem solving.



Physical Sciences

Physical sciences during grades 3–5 may explore questions including:

- What allows us to see the world around us?
- How is energy transferred?
- When matter changes, does its weight change?



Life Sciences

Life Sciences during grades 3–5 may explore questions including:

- How do organisms vary in their traits?
- Why do some flowers have such colorful petals?
- What do mushrooms eat?

Earth and Space Sciences

Earth and space sciences during grades 3–5 may explore questions including:

- Why do some constellations disappear in the winter?
- How can water, ice, wind, and vegetation change the land?
- How can we keep buildings from collapsing during an Earthquake?

Engineering Design

Engineering design during grades 3–5 may explore questions including:

- Which solution is the best to solve a problem?
- How can designs be improved?
- How do engineers improve existing technologies to increase their benefits, decrease known risks, or meet societal demands?

How can you support your child's success?

Although Tennessee's new approach to teaching and learning K–12 science is different than the past, you can still actively support your child's success in the classroom!

1. Speak to your child's teacher(s) or principal about how these important changes affect your school.
2. Ask your child's teacher thoughtful questions based on the information provided in this brochure.
3. Learn how you can help the teacher(s) reinforce classroom instruction at home.
4. Visit <http://bit.ly/TNScience1819> for more information.

Classroom activities in Elementary School will look less like this:	And look more like this:
Students have infrequent exposure to science instruction or related activities.	Students engage with science concepts as a core part of instruction and are encouraged to connect lessons to their own personal experiences.
Students learn that matter is made of particles.	Students collect data through activities, such as compressing air in a syringe, in order to create cognitive models of matter.
Students draw food webs for particular environments.	Students construct scientific arguments about how matter and energy move through ecosystems in different ways.
Students review the characteristics of various rocks and minerals.	Students gather evidence from rock formations to help determine the order in which rock layers were formed.
Students have infrequent exposure to discussions or activities related to engineering design.	Students consider or apply engineering design principles throughout each grade level.
Student discussions and activities are disconnected from mathematics or English/Language Arts instruction.	Student discussions and activities are thoughtfully integrated with mathematics and English/Language Arts instruction.

Reshaping Science Education for All Students

To better prepare Tennessee's students for college and careers, schools need to ensure that quality science education is accessible to all students—regardless of ethnicity or zip code.

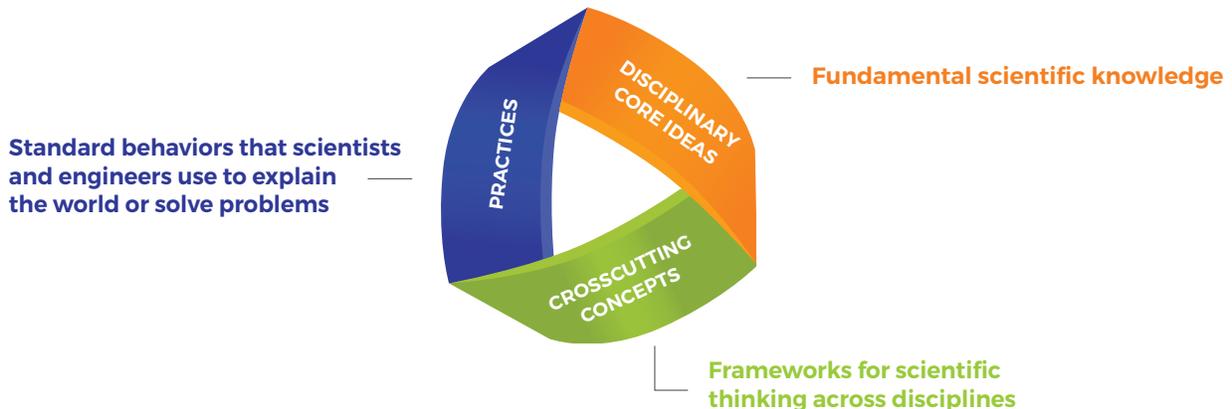
In an effort to bolster America's competitive edge in an increasingly global economy, Tennessee developed these standards by working with teachers, higher education, business, and practicing scientists. This collaborative process produced a set of high quality, college- and career-ready K-12 academic standards that set meaningful expectations for student performance and achievement in science. The standards are rich in both content and practice and arranged in a coherent manner across all disciplines and grades.



Fact: “Standards” are not “curriculum”. “Standards” provide clarity about *what students should know and be able to do by the end of each grade level*. “Curriculum” refers to *how students meet those expectations*. Please contact your child’s teacher or school if you have questions about their curriculum.

Three Dimensions of Science Learning

The Tennessee Science standards emphasizes three distinct, yet equally important dimensions that help students learn science. Each dimension is integrated into the standards and—combined—the three dimensions build a powerful foundation to help students build a cohesive understanding of science over time.



Support your child's success in the classroom!