

Preparing Students for a Lifetime of Success

Understanding the
New Science
Standards for
Grades PK-2

How will we prepare students for academic success?

Our school system has adopted new standards based on the Next Generation Science Standards (NGSS) 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 **College and Career Ready Standards for Science (CCRSS)** enables 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 K–2.

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

These science standards complement our college and career ready mathematics standards and the upcoming literacy 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 provide an equitable, high-quality science education to all of our students. These new standards will be gradually implemented in grades K-5 during the 2017-2018 school year. The first semester will be a transitional time during which new curriculum resources will be provided to teachers as well as professional learning opportunities.



What is our vision for science education?

DoDEA'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 new 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, DoDEA students 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 K–2, your child will begin to form connections between concepts and skills such as understanding relationships between objects, planning and carrying out investigations, and constructing explanations.

Upon completion of grades K–2, your child should have a deeper understanding of:

- Motion and properties of matter;
- Relationship between sound and vibrating materials;
- Factors that impact what plants and animals need to survive; and
- How objects can be changed or improved through engineering.

Physical Sciences



Physical sciences during grades K–2 may explore questions such as:

- How does pushing or pulling an object change the speed or direction of its motion?
- How do objects change motion when they touch or collide?
- What are some effects of sunlight on earth's surface?

Life Sciences



Life Sciences during grades K–2 may explore questions such as:

- What do plants and animals need to live and grow?
- How does the insect survive the winter if the plant is dead?
- How are parents and their children similar and different?

Earth and Space Sciences



Earth and space sciences during grades K–2 may explore questions such as:

- What are the different kinds of lands and bodies of water?
- Why is it usually cooler in the mornings than in the afternoons?
- What objects are in the sky and how do they seem to move?

Engineering Design



Engineering design during grades K–2 may explore questions such as:

- What is a local example of engineering design?
- What materials were used to construct the project?
- What kinds of problems can be solved through engineering?

For additional information about academic expectations for students in Grades K-2, visit <http://www.dodea.edu/Curriculum/Science/standards.cfm>

How can you support your child's success?

Although DoDEA'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. Engage in discussions with your child to marvel at real-world phenomena such as how a giant tree grows from a tiny seed. Encourage your child to ask questions and develop a sense of wonder.



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 memorize the general structure and properties of matter.	Students use water and butter to investigate how some changes caused by heating or cooling can be reversed while others cannot.
Students examine insects or bugs on the playground or during special events such as science fairs.	Students observe the life cycles of beetles, butterflies, and pea plants to identify patterns that are common to all living things.
Students draw static pictures of the sun to demonstrate where it is at different times of the day.	Students support claims about the movement of the sun by identifying an outdoor object that receives direct sunlight, then tracing an outline of its shadow at three different times during the day.
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.



About NGSS: Reshaping Science Education for All Students

To better prepare American students for college and careers, schools need to ensure that quality science education is accessible to all students— regardless of ethnicity or location.

In an effort to bolster America’s competitive edge in an increasingly global economy, 26 states led the development of the Next Generation Science Standards (NGSS) 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 NGSS are rich in both content and practice and arranged in a coherent manner across all disciplines and grades.

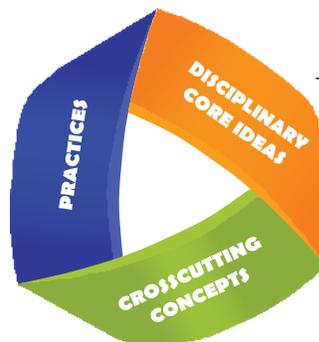


Fact: “Standards” are not “curriculum”. “Standards” provide clarity about *what students should know and be able to do by the end of each grade level*. “Curriculum” refers to *how students meet those expectations*. Please contact your child’s teacher or school if you have questions about their curriculum.

Three Dimensions of Science Learning

The **College and Career Ready Standards for Science** emphasize 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.

Standard behaviors that scientists and engineers use to explain the world or solve problems



Fundamental scientific knowledge

Frameworks for scientific thinking across disciplines

Support your child’s success in the classroom!



College and Career Ready Standards for Preschool (CCRSP)

In DoDEA's Prekindergarten and Sure Start programs, there are five objectives that address science and technology.

- Uses scientific inquiry skills
- Demonstrates knowledge of the characteristics of living things
- Demonstrates knowledge of the physical properties of objects and materials
- Demonstrates knowledge of Earth's environment
- Uses tools and other technology to perform tasks

The daily activities and investigations used in DoDEA's Prekindergarten and Sure Start programs will help prepare students for success with the **College and Career Ready Standards for Science** when they enter kindergarten. The Prekindergarten and Sure Start classrooms are designed as a place for children to explore and investigate to answer questions. They observe, experiment, measure, solve problems, take things apart, and handle materials and living things. They predict what will happen as a result of their actions.

Just like Scientists and Engineers....

Our youngest learners, just like in K-12, are doing what scientists and engineers do as a part of their learning experiences. They ask questions, plan and conduct investigations, gather information, construct explanations, and communicate findings. They figure out important scientific concepts as they study trees, clothes, balls, recycling, buildings, roads, exercise, boxes, and more. In addition to learning the science content, they develop skills scientists and engineers use such as working together to solve problems and communicate their ideas and observations with others.



How can you help your preschooler be prepared for the **College and Career Ready Standards for Science**?

Young children are curious and love to investigate. You don't need to be an expert to help your child learn about science. Science is all around us, from making bubbles in the bathtub to boiling water on the stove. Your enthusiasm and positive attitude about science will be contagious. Get in the habit of wondering out loud ("I wonder how that ant can carry that big piece of food"; "I wonder why your shadow is sometimes small and sometimes big.").

The questions you ask and comments you make when your child is exploring can extend his or her scientific thinking. Here are some examples:

"What do you think will happen when. . . ?"

"I wonder why. . ."

"How do think we can find out. . . ?"

Look for opportunities to support your child's scientific thinking during everyday activities: playing with toys, taking a bath, helping to make dinner, playing in the backyard, or going on an outing. Remember, you don't need to know all of the answers! It is a good sign if your child is curious, wants to investigate everything, asks lots of questions, and wants more answers.

