



Vertical Alignment of Scientific and Engineering Practice: Using Safe Investigation Practices

TEKS in Focus highlights key concepts and student expectations to assist educators in implementing the science Texas Essential Knowledge and Skills (TEKS). The vertical progression of a concept within the science TEKS is provided along with the detailed explanations provided in TEKS Guide. The science TEKS include scientific and engineering practices in strand one. To create a cohesive learning experience, educators should integrate scientific and engineering practices with content. Embedding these practices into the content provides students with the context in which to ask questions, develop models, and analyze data. This approach ensures that students develop critical thinking and problem-solving skills by applying scientific and engineering practices in real-world scenarios while learning the content.

Detailed explanations are provided for bold words in the student expectation. Detailed explanations call out a specific word or phrase in a student expectation to clarify what students should know and be able to do in reference to that word or phrase. Detailed explanations may include an instructional boundary that specifies Tier 1 (baseline) instructional expectations for all students.

Scientific and Engineering Practice 1C

Science TEKS	Term or Phrase	Detailed Explanations from TEKS Guide
K.1.C, 1.1.C, 2.1.C identify, describe, and demonstrate safe practices during classroom and field investigations as outlined in Texas Education Agency-approved safety standards;	classroom and field investigations	Students should experience both classroom and field investigations to support instruction in the science content standards. For kindergarten through grade 1, the TEKS recommended that students experience scientific and engineering practices through classroom and outdoor investigations for at least 80% of instructional time. In grades 2–3, the TEKS recommend that students experience scientific and engineering practices through classroom and outdoor investigations for at least 60% of instructional time.
3.1.C, 4.1.C, 5.1.C demonstrate safe practices and the use of safety equipment during classroom and field investigations as outlined in Texas Education Agency-approved safety standards;	classroom and field investigations	In grades 2–3, the TEKS recommend that students experience scientific and engineering practices through classroom and outdoor investigations for at least 60% of instructional time. In grade 4–5, the TEKS recommend that students experience scientific and engineering practices through classroom and outdoor investigations for at least 50% of instructional time.

Science TEKS	Term or Phrase	Detailed Explanations from TEKS Guide
6.1.C to HS use appropriate safety equipment and practices during laboratory, classroom, and field investigations as outlined in Texas Education Agency-approved safety standards;	laboratory, classroom, and field investigations	Students are required to participate in scientific and engineering practices through laboratory, classroom, and outdoor investigations at least 40% of the instructional time.

TEKS Guide Further Explanation:

The further explanation section is designed to be a resource for educators that helps them better understand the topic their students are learning. Further explanations may be written at a more complex level than would be expected for students at the grade level.

Like scientists, engineers must identify relevant variables, decide how they will be measured, and collect data for analysis. Their investigations help them identify how effective, efficient, and durable their designs may be under various conditions. In addition to acting as scientists and engineers, Texas students are expected to follow the [Texas Education Agency-approved safety standards](#).

Classroom and field investigations:

Some investigations involve simple observations as scientists try to understand a process or behavior. This type of investigation is called a descriptive investigation.

A comparative investigation involves comparing a process or behavior in two different settings. A correlative investigation attempts to determine how related two variables are.

Another kind of investigation is called an experimental investigation. An experimental investigation involves a test with identified variables. Some variables stay the same throughout the experiment, the scientist manipulates one variable, and another variable responds to the manipulated variable. Scientists observe the relationship between the variables during the experiment. This kind of experiment can also be called a controlled experiment.

TEKS in Focus spotlights concepts or student expectations monthly to bolster TEKS alignment, rigor, and collective understanding. It does not suggest an order or timing but helps with comprehension of TEKS changes, serving as a guide when relevant to classroom instruction.