The University of Texas at Austin
UT High School

110615

Grade 3 Science

EA/CBE Content Study Guide

This Exam for Acceleration/Credit by Exam Study Guide can help you prepare for the exam by giving you an idea of what you need to study, review, and learn. To succeed, you should be thoroughly familiar with the subject matter before you attempt to take the exam.

Every question that appears on the Exam for Acceleration/Credit by Exam is grounded in the knowledge and skills statements and student expectations within the state-mandated standards, the Texas Essential Knowledge and Skills (TEKS). It should be noted that an exam will not test every student expectation. However, it is important that students study and know the entire scope of the TEKS so that they can develop a complete understanding of the content. The EA/CBEs are a global exam grounded in the TEKS and are not designed to be a final exam. **For a specific listing of the knowledge and skills for this grade level and subject area, please reference the TEKS online at http://www.tea.state.tx.us/index2.aspx?id=6148.** Since questions are not taken from any one source, you can prepare by reviewing any of the state-adopted textbooks.

General Introduction

What is the EA/CBE science test based on?

The EA/CBE is based on the state-mandated science standards, the TEKS. All science assessments will be developed using selected knowledge and skills statements and student expectations from the science TEKS. The elementary science tests are based on eligible science TEKS from grades K–5.

How were the TEKS chosen to be on the science test?

The science TEKS statements and student expectations eligible for assessment were determined to be appropriate based on the blueprint for the TAKS test. Although some student expectations within the TEKS are not assessed, educators teach the entire science curriculum so that students can develop a complete understanding of critical science concepts.

How are the TEKS organized within the CBE?

The knowledge and skills statements, with their associated student expectations, are organized under objectives on the CBE. These objectives group the eligible student expectations into categories with similar content. The elementary science test has four objectives.

What is the question format for the science tests?

All items should be in a multiple-choice format with four options. Some multiple-choice items can be written as part of a cluster. A cluster should have a stimulus, which may be a diagram, a brief passage, a chart, or a combination of these, followed by a series of items that should involve the application of knowledge and analysis of the given information.

Can any of the science questions be performance based?
The only direct performance testing on the science tests is using a ruler to measure with precision. Some items should require students to physically use a ruler to measure a drawing of an object in centimeters or millimeters. Although precise measurement is the direct performance-based requirement, many items are based on lab or field activities that students should have experienced. These lab and field experiences should include the use of lab and field equipment.

What about the untested TEKS in the elementary school assessment?
Because of the constraints of a single assessment, not all TEKS can be assessed. While some student expectations are not tested, all the TEKS are critical for students' overall understanding of science. For example, (7.11), "The student knows that the responses of organisms are caused by internal or external stimuli. The student is expected to (A) analyze changes in organisms such as a fever or vomiting that may result from internal stimuli; and (B) identify responses in organisms to external stimuli found in the environment such as the presence or absence of light," is not directly tested, but students must understand this concept in order to successfully answer items testing (8.6), "The student knows that interdependence occurs among living systems. The student is expected to (A) describe interactions among systems in the human organism; (B) identify feedback mechanisms that maintain equilibrium of systems such as body temperature, turgor pressure, and chemical reactions; and (C) describe interactions within ecosystems." The relationship between organisms that are composed of several systems maintaining homeostasis (equilibrium) and their role in the environment is not fully understood until eighth grade, when it is assessed in the middle school test. This concept is then more fully explored in high school through Biology (10), "The student knows that, at all levels of nature, living systems are found within other living systems, each with its own boundary and limits. The student is expected to (A) interpret the functions of systems in organisms including circulatory, digestive, nervous, endocrine, reproductive, integumentary, skeletal, respiratory, muscular, excretory, and immune."

What types of equipment may be referenced on the elementary school science test?
Students are expected to have experience using all of the tools and equipment commonly used in first through eighth grades. This includes beakers, test tubes, Petri dishes, graduated cylinders, microscopes (dissecting and compound), safety goggles (splash-proof), spring scales, triple-beam balances, meter sticks, hot plates, thermometers, models (such as topographic maps and globes), computers, computer probes (for temperature and pH), calculators, timing devices, weather instruments, telescopes, and field equipment such as binoculars, dip nets for collection, and water test kits.

Content Overview

In **Grade 3**, students learn that the study of science uses appropriate tools and safe practices in planning and implementing investigations, asking and answering questions, collecting data by observing and measuring, and by using models to support scientific inquiry about the natural world.

(A) Students recognize that patterns, relationships, and cycles exist in matter. Students will investigate the physical properties of matter and will learn that changes occur. They explore mixtures and investigate light, sound, and heat/thermal energy in everyday life. Students manipulate objects by pushing and pulling to demonstrate changes in motion and position.

(B) Students investigate how the surface of Earth changes and provides resources that humans use. As students explore objects in the sky, they describe how relationships affect patterns and cycles on Earth. Students will construct models to demonstrate Sun, Earth, and Moon system relationships and will describe the Sun's role in the water cycle.

(C) Students explore patterns, systems, and cycles within environments by investigating characteristics of organisms, life cycles, and interactions among all components of the natural environment. Students examine how the environment plays a key role in survival. Students know that when changes in the environment occur organisms may thrive, become ill, or perish.

Objective 1

Student demonstrates an understanding of Scientific investigation and reasoning.

Student should:

- perform the activities of scientists, which include making observations, collecting data, and drawing conclusions.
- learn a variety of methods and different tools to solve problems and make sense of the world.
- participate in laboratory and field activities.
- use evidence to evaluate the strengths and weaknesses of a scientific explanation of a given phenomenon, determine if the explanation makes sense based on the evidence, and then explain how they arrived at their conclusions.
- make precise measurements from illustrations.
- read masses from triple-beam or double-pan balances, volumes from graduated cylinders, such as rain gauges, and temperatures from thermometers, and determine the lengths in both centimeters and millimeters of objects using a ruler.
- understand that models are not perfect representations and have limitations.
- understand that repeated trials may increase the reliability of results, even if that concept is not directly assessed.

For a specific listing of the knowledge and skills for this grade level and subject area, please reference the TEKS online at http://www.tea.state.tx.us/index2.aspx?id=6148.

Objective 2

Student demonstrates an understanding of organisms and environments.

Students should:

- observe and describe the physical characteristics of environments and how they support populations and communities within an ecosystem.
- identify and describe the flow of energy in a food chain and predict how changes in a food chain affect the ecosystem such as removal of frogs from a pond or bees from a field.
- describe environmental changes such as floods and droughts where some organisms thrive and others perish or move to new locations.
- explore how structures and functions of plants and animals allow them to survive in a particular environment.
- explore that some characteristics of organisms are inherited such as the number of limbs on an animal or flower color and recognize that some behaviors are learned in response to living in a certain [from the] environment such as animals using tools to get food.
- investigate and compare how animals and plants undergo a series of orderly changes in their diverse life cycles such as tomato plants, frogs, and lady bugs.

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Objective 3

Student demonstrates an understanding of the physical sciences.

Students should:

- understand magnetism, and the ability to sink or float.
- describe and classify samples of matter as solids, liquids, and gases and demonstrate that solids have a definite shape and that liquids and gases take the shape of their container.
- predict, observe, and record changes in the state of matter caused by heating or cooling.
- explore and recognize that a mixture is created when two materials are combined such as gravel and sand and metal and plastic paper clips.
- explore different forms of energy, including mechanical, light, sound, and heat/thermal in everyday life.
- demonstrate and observe how position and motion can be changed by pushing and pulling objects to show work being done such as swings, balls, pulleys, and wagons.
- observe forces such as magnetism and gravity acting on objects.

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Objective 4

Student demonstrates an understanding of the earth and space.

Students should:

- explore and record how soils are formed by weathering of rock and the decomposition of plant and animal remains.
- investigate rapid changes in Earth's surface such as volcanic eruptions, earthquakes, and landslides;
- identify and compare different landforms, including mountains, hills, valleys, and plains.
- explore the characteristics of natural resources that make them useful in products and materials such as clothing and furniture and how resources may be conserved.
- observe, measure, record, and compare day-to-day weather changes in different locations at the same time that include air temperature, wind direction, and precipitation.
- describe and illustrate the Sun as a star composed of gases that provides light and heat energy for the water cycle.
- construct models that demonstrate the relationship of the Sun, Earth, and Moon, including orbits and positions.
- identify the planets in Earth's solar system and their position in relation to the Sun.

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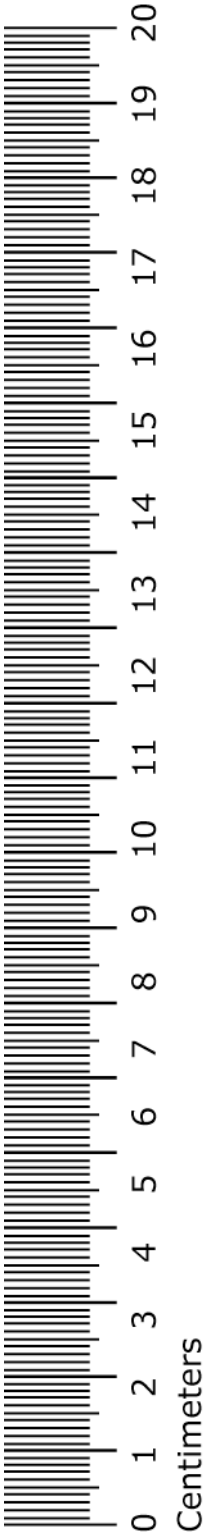
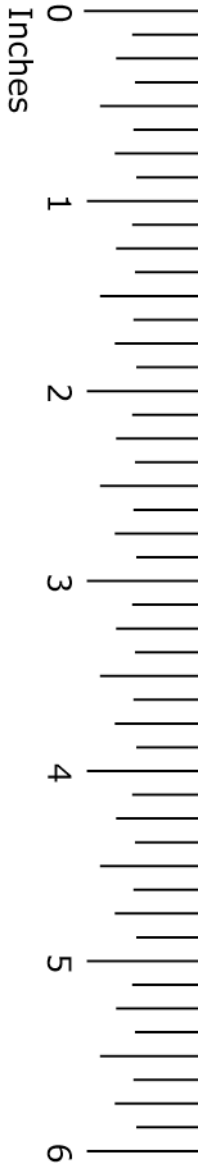
About the Exam

The EA/CBE consists of 75 objective questions that are equally weighted. The exam may consist of multiple-choice and true-false questions. The exams will include an exam booklet and a separate computer graded answer sheet. Enough room is left around each item in the booklet for students to work each problem. Student responses **must** be recorded on the computer graded answer sheet. Students will be allowed **3 hours** to take the exam and will **NOT** be allowed to use a calculator.

Rulers with the Exam

You will be provided these rulers with your exam.





Sample Questions

These sample questions will give you a better idea of the types of questions you can expect on the EA/CBE. These are provided to illustrate the format of the exam. They are not the actual exam. In order to be successful on the exam, you must study the TEKS for this grade level and subject area.

1. Heat from the sun causes water to evaporate, transforming water from a _____.

   A liquid to a gas
   B gas to a solid
   C solid to a liquid
   D gas to a liquid

2. What do opposite poles of a magnet do?

   A Attract
   B Mix
   C Move
   D Repel

3. A group of caterpillars were fed milkweed on three different schedules for one week. According to the table, which feeding schedule will produce the **LEAST** amount of growth in a caterpillar eating milkweed?

Feeding Schedule

Frequency of Caterpillar Feeding	Caterpillar Growth (Millimeters)
Once a day	3
Twice a day	5
Three times day	6

   A Once a day
   B Twice a day
   C Three times a day
   D All day

Answer Key

Item Number	Correct Answer
1	A
2	A
3	A