New York State Testing Program

Educator Guide to the Regents Examination in Earth and Space Sciences

New York State P-12 Learning Standards

June 2024

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Foreword

The information contained in this Educator Guide is designed to raise educator awareness of the structure of the New York State Regents Examination in Earth and Space Sciences measuring the New York State P-12 Science Learning Standards (https://www.nysed.gov/sites/default/files/programs/standards-instruction/p-12-science-learning-standards.pdf).

The guide provides educators with pertinent information about the

The New York State P-12 Science Learning Standards

The New York State P-12 Science Learning Standards (NYSP-12SLS) are a series of Performance Expectations (PEs) that define what students should know and be able to do as a result of their study of science. The New York State P-12 Science Learning Standards are based on the Framework for K–12 Science Education (the Framework) develop

Test Specifications

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The Science Regents Examinations are rooted in a research (S)-10 dTd (397.32 5 0 6.76 13.8)Tj 0 re f 54 Td (s

Claim #2 (History of Earth):
A student can evaluate evidence from active geologic processes in the rock record, use scientific reasoning, and apply evidence from other planetary bodies to construct an account of Earth's formation and history, and to develop a model that illustrates how both gradual and catastrophic geologic processes operate at different spatial and temporal scales to change Earth's geographic features.
Evidence: A student demonstrates understanding of the "history of Earth" through application, evaluation, analysis, and/or synthesis using science and engineering practices, core ideas, and crosscutting concepts related to: - A model that describes geologic features and their formation at or below Earth's surface [HS-ESS2-1] - Patterns of change at different spatial and temporal scales that influence the formation and destruction of geologic features [HS-ESS1-5 and HS-ESS2-1] - Scientific reasoning and the application of evidence from Earth and other solar system objects that explains Earth's formation, history, and age [HS-ESS1-6]
Claim #3 (Earth's Systems): A student can develop models and investigations, analyze data and feedback mechanisms, and construct arguments based on evidence that demonstrate the coevolution of life with Earth's changing systems and the cycling of matter and energy within and between Earth's systems.
Evidence: A student demonstrates understanding of "Earth's systems" through application, evaluation, analysis, and/or synthesis using science and engineering practices, core ideas, and crosscutting concepts related to - The unique characteristics of water and the effects of water on Earth [HS-ESS 2-5] - Geoscience dTm [0 Td ( )Tj /T1_0 1 Tf 0 Tr 0.002 0 Td ( )Tj /TT0 1 Tf -0.004 Tc 0.004 Tw 12 0 0 12

Claim #4 (Weather and Climate):
A student can analyze and evaluate atmospheric and geoscience data to model and communicate information that explains how the flow of energy in Earth's systems influences past, present, and future changes to Earth's weather and climate conditions.

Evidence: A student demonstrates understanding of "human sustainability" through application, evaluation, analysis, and/or synthesis using science and engineering practices, core ideas, and crosscutting concepts related to:

- A model that describes how changes in Earth's climate result from variations in energy flow into and out of Earth's systems [HS-ESS2-4, HS-ESS3-5]
- An understanding of weather variables and how interactions of these variables result in changes in Earth's systems [HS-ESS 2-8, HS-ESS2-4]
- Patterns of past and current weather/climate data that are used to forecast short- and long-term atmospheric conditions [HS-ESS2-8, HS-ESS3-5]

Claim #5 (Human Sustainability):
A student can construct an evidence-based explanation of human-induced climate change, evaluate energy usage, create a computational simulation for sustainability, evaluate or refine a technological solution to reduce human impact, and use a computational representation to illustrate the relationship between human activity and Earth's systems.

Evidence: A student demonstrates understanding of "human sustainability" through application, evaluation, analysis, and/or synthesis using science and engineering practices, core ideas, and crosscutting concepts related to:

- Evidence that climate change has influenced human activity over time [HS-ESS3-1]
- Relationships between resources used by humans and the impacts on Earth's systems and climate [HS-ESS3-2]
- Simulations based on historical and current data that show how responsible energy use can promote sustainability and biodiversity [HS-ESS3-3]
- Technological solutions that are designed to address the costs and benefits of using natural resources, while balancing human needs with the mitigation of environmental impacts [HS-ESS3-4]

Claim #6 (Engineering Design):

A student can analyze models, including mathematical and computer simulations, that present criteria, trade-offs, and a range of constraints to design and evaluate a solution that optimizes technological and engineering practices for the management of systems, societal needs, environmental impacts, and real-world problems.

Evidence: A student demonstrates understanding of “engineering design” through application, evaluation, analysis, and/or synthesis using science and engineering practices, core ideas, and crosscutting concepts related to:

- Students collected data, models, and simulations that identify, describe, and solve real-world problems designed to balance societal needs with societal wants while attempting to reduce impacts. [HS-ETS1-2, HS-ETS1-4]
- Solutions to global challenges that meet criteria, require trade-offs, and are limited by constraints as illustrated by various types of models (computer, simulations, engineering). (HS-ETS 1-1, HS-ETS1-3)

Performance Level Definitions

For each subject area, students perform along a continuum of the knowledge and skills necessary to meet the demands of the Learning Standards for Science. There are students who meet the expectations of the standards with distinction, students who fully meet the expectations, students who minimally meet the expectations, students who partially meet the expectations, and students who do not demonstrate sufficient knowledge or skills required for any performance level. New York State assessments are designed to classify student performance into one of five levels based on the knowledge and skills the student has demonstrated.

These performance levels for the Science Regents Examinations are defined as:

NYS Level 5
Students performing at this level meet the expectations of the Science Learning Standards **with distinction** for Earth and Space Sciences.

NYS Level 4
Students performing at this level **fully meet** the expectations of the Science Learning Standards for Earth and Space Sciences. They are likely prepared to succeed in the next level of coursework.

NYS Level 3
Students performing at this level **minimally meet** the expectations of the Science Learning Standards Tence L-20w -1

Test Design and Administration

Test Blueprint

The table below illustrates the test blueprint percent ranges for each topic in Earth and Space Sciences (ESS). All questions on the 2025 Earth and Space Sciences Test measure the New York State P-12 Science Learning Standards. All the Performance Expectations (PEs) within the learning standards are connected to the Scientific and Engineering Practices (SEPs), Disciplinary Core Ideas (DCIs), and Crosscutting Concepts (CCCs). Therefore, every question on the Earth and Space Sciences Test will draw from all three

Stimuli

The number of stimuli and the scale of real