May 2024

WHAT'S NEW

Improvements for the new high school Science courses will ensure that learners have a Next Generation Science Standards (NGSS) aligned, media-rich, and interactive experience to provide an engaging learning environment to bolster understanding of course content and improve outcomes. Our current science courses will remain available for customers whose alignment needs are better met by them.

TIMELINE OF DELIVERY AND COMMUNICATIONS

These newly designed and 100% NGSS-aligned courses will be customer-ready in June 2024. Your Customer Success Manager will coordinate delivery to your learning management system.

NEW COURSE INFORMATION

Biology (1 of 2)	**SCED ID:** 03 051 G 0912 0102	**Grades:** 9 - 12	**Availability:** June 2024

Course Description: Biology (1 of 2) offers a comprehensive journey from the molecular level of organisms to the complexity of ecosystems. It starts with the structure and function of multicellular organisms, emphasizing the use of models to illustrate biological processes. The course then draws connections between geological processes and life on Earth through engaging concepts like photosynthesis, cellular respiration, and carbon cycling.

Materials Required: hole punch, piece of cloth (should contain patterns of many different colors), graph paper, 6 boxes or cups, 6 leaves from plants with visible stomata, 10 colored sheets of paper, 10 small bowls, art supplies, calculator, clay or modeling dough (different colors), heart-rate monitor interactive, ice cubes, magnifying glass or microscope, markers, paper, pen, poster (digital or paper), thermometer, toothpicks or craft sticks, water, word processing software

Optional: colored pencils, craft supplies, digital art materials

Improvements:	**Related Course Information / Delivery Date:**
• 100% Alignment to NGSS Standards • This course has interactive simulations providing students with engaging science concept learning opportunities. • Performance-based activities have been created for each standard, including a Teacher Guide for the activities.	Biology (2 of 2) Available Winter 2024

Course Scope and Sequence Biology (1 of 2)*

Unit 1: Biological Systems and Global Health Dynamics	**Unit 4: Genetics and Solutions for Global Challenges**
• Lesson 1: *Hierarchy in Multicellular Organisms* • Lesson 2: *Feedback Mechanisms in the Human Body*	• Lesson 16: *The Mechanisms of Genetic Variations* • Lesson 17: *Evidence and Reasoning for Genetic Variations*

- Lesson 3: *Feedback Mechanisms Investigation Plan*
- Lesson 4: *Investigating Global Health Issues*
- Lesson 5: *Photosynthesis and Energy Transformation*

Unit 2: Chemical Foundations of Life's Processes

- Lesson 6: *Role of Basic Elements in Sugar Molecules*
- Lesson 7: *From Sugars to Complex Molecules*
- Lesson 8: *Cellular Respiration and Energy Net Transfer*
- Lesson 9: *Matter Cycling and Energy Flow*
- Lesson 10: *Carbon Flow in Earth's Systems*

Unit 3: Genetic Processes and Organism Complexity

- Lesson 11: *DNA's Role in Protein Structure*
- Lesson 12: *DNA, Proteins, and Cell Functions*

Lesson 13: *Cell Differentiation*

- Lesson 14: *Role of Cell Division and Differentiation*
- Lesson 15: *DNA and Genetic Traits*
- Lesson 18: *Data Analysis of Expressed Traits*
- Lesson 19: *Criteria for Global Challenge Solutions*
- Lesson 20: *Societal Considerations in Global Solutions*

Unit 5: Evolutionary Evidence and Earth's Dynamics

- Lesson 21: *Trails to Common Ancestry and Evolution*
- Lesson 22: *Evidence for Evolution and Common Ancestry*
- Lesson 23: *Four Factors of Evolutionary Processes*
- Lesson 24: *Key Factors and Mechanisms in Evolution*
- Lesson 25: *Plate Tectonics Theory*
- Lesson 26: *Geological Evidence and Genetic Variations*

Unit 6: Earth's and Life's Coevolution

- Lesson 27: *Methods in Studying Earth Formation*
- Lesson 28: *Earth's Formation and Early History*
- Lesson 29: *Geological Events and Biological Evolution*
- Lesson 30: *Coevolution of Earth and Life*

Chemistry (1 of 2)	**SCED ID:** 03 101 G 0912 0102	**Grades:** 9 - 12	**Availability:** June 2024

Course Description: Chemistry (1 of 2) delves into chemistry's core principles, connecting them to Earth's systems and cosmic processes. It covers the sun's lifecycle, nuclear fusion, and star-produced elements, using the periodic table for predicting elemental behaviors and electron configurations. The course addresses nuclear changes, fission, fusion, and decay, alongside a detailed examination of the carbon cycle's global impact. It also explores chemical reaction energetics, bond energy dynamics, and the conservation of mass principle.

Materials Required: art supplies or digital drawing software, baking soda, balloon, calculator, chart of the star's life cycle, clear plastic container, container, digital scale, glass of water (room temperature), laptop, local historical weather data (online or from a local weather station), notebook, online/offline resources for chemical data, pen or pencil, pH test strips (available at aquarium supply stores or online), poster board, presentation tool, references (books, journals, internet access), research materials like a computer or books, straw, thermometer, video of lighting fireworks, vinegar, warm water, word processing software, word processing software (with diagram tool), yeast
Optional: electron configuration chart

Improvements:	**Related Course Information / Delivery Date:**
• 100% Alignment to NGSS Standards	Chemistry (2 of 2) Available Winter 2024

- This course has interactive simulations providing students with engaging science concept learning opportunities.
- Performance-based activities have been created for each standard, including a Teacher Guide for the activities.

Course Scope and Sequence Chemistry NGSS (1 of 2)*

Unit 1: Elements and Cosmic Patterns
- Lesson 1: Predict Element Properties
- Lesson 2: Electrons and Bonds
- Lesson 3: Main Group Elements and Oxygen
- Lesson 4: Star Life Cycle and Elements
- Lesson 5: Stars and Elements in the Universe

Unit 2: Nuclear Science and Solar Energy
- Lesson 6: *Nuclear Processes*
- Lesson 7: *Stability and Decay*
- Lesson 8: *Advancements in Nuclear Science*
- Lesson 9: *Factors Affecting Solar Life Span*
- Lesson 10: *Understanding the Source of Solar Energy*

Unit 3: Chemical Reactions and Carbon Cycle
- Lesson 11: *Chemical Properties*
- Lesson 12: *Chemical Reactions*
- Lesson 13: *Chemical Reactions and Energy*
- Lesson 14: *Carbon Cycle and Earth Systems*
- Lesson 15: *Photosynthesis and Respiration*
- Lesson 16: *Climate Events and Carbon Cycling*

Unit 4: Carbon Cycle and Chemical Dynamics
- Lesson 17: *Quantifiable Processes in Carbon Cycle*
- Lesson 18: *Energy in Carbon Cycle Reactions*
- Lesson 19: *Air Pollution Solutions*
- Lesson 20: *Improve an Air Pollution Solution*

Unit 5: Energy and Mass in Chemical Reactions
- Lesson 21: *Factors Affecting Energy Changes in Reactions*
- Lesson 22: *Bond Energies in Chemical Reactions*
- Lesson 23: *Bond Energy and Real-World Examples*
- Lesson 24: *Law of Conservation of Mass*
- Lesson 25: *Stoichiometry and Mass Conservation*
- Lesson 26: *The Mole Concept in Reactions*

Unit 6: Climate Change and Solutions
- Lesson 27: *Mass Conservation in Climate*
- Lesson 28: *Global Climate Models*
- Lesson 29: *Criteria and Constraints in Conservation*
- Lesson 30: *Climate Solutions Simulations*

Earth and Space Science (1 of 2)	**SCED ID:** 03 008 G 0912 0102	**Grades:** 9 - 12	**Availability:** June 2024

Course Description: Earth and Space Science (1 of 2) offers a deep understanding of Earth's dynamic systems and the impact these processes have on human activity. The course emphasizes the carbon cycle's significance, demonstrating its impact through visual models and experiments. Additionally, it addresses the effects of human activity on Earth's systems, including climate change, natural resource management, and sustainability of living things.

Materials Required: art supplies, calculator, clay or playdough (various colors), digital software for model creation (ex. slides, digital art creation, etc.), paper, poster board or foam board, presentation software, spreadsheet software, word processing software, writing/drawing tools
Optional: plastic bin or shallow container, rocks or other solid materials, ruler or measuring tape, sand or soil, small rocks, pebbles, sand or fine gravel, water source

Improvements:	**Related Course Information / Delivery Date:**
• 100% Alignment to NGSS Standards • This course has interactive simulations providing students with engaging science concept learning opportunities. • Performance-based activities have been created for each standard, including a Teacher Guide for the activities.	Earth and Space Science (2 of 2) Available Winter 2024

Course Scope and Sequence Earth and Space Science NGSS (1 of 2)*

Unit 1: Earth's Resources
- Lesson 1: *Impact of Constructive and Destructive Forces*
- Lesson 2: *Earth's Internal and Surface Processes*
- Lesson 3: *Carbon Cycle: Fossil Fuels & Earth's Balance*
- Lesson 4: *Quantitative Models of Carbon Cycle*
- Lesson 5: *Coevolution of Earth and Life*

Unit 2: Energy Flow and Climate
- Lesson 6: Earth's Climate
- Lesson 7: Energy and Climate
- Lesson 8: Understanding Earth's Interconnected Systems
- Lesson 9: Changes in Earth and Feedback Loops
- Lesson 10: Forecast Climate Trends and Impacts

Unit 3: Carbon Dynamics and Climate
- Lesson 11: *The Earth's Carbon Cycle*
- Lesson 12: *Carbon Pools and Flows*
- Lesson 13: *Analyzing Human Impact on Earth Systems*
- Lesson 14: *Renewable Energy Solutions*
- Lesson 15: *Analyze Cost-Benefit Ratios*

Unit 4: Mountains, Valleys, and Coasts
- Lesson 16: *Constructive and Destructive Forces*
- Lesson 17: *Scales in Shaping Earth's Features*
- Lesson 18: *Weathering and Erosion Caused by Water*
- Lesson 19: *Influence of Water on Earth's Surface*
- Lesson 20: *Environmental Impact on Humans*

Unit 5: Water and Farming
- Lesson 21: *Climate Change and Agricultural Resources*
- Lesson 22: *Develop Farm Practices in Response to Hazards*
- Lesson 23: *Visual Models of Agricultural Efficiency*
- Lesson 24: *Impact of Climate on Agricultural Efficiency*
- Lesson 25: *Agricultural Water Management*

Unit 6: Human Impacts
- Lesson 26: *Global Climate Models and Climate Change*
- Lesson 27: *Climate Change and its Impacts*
- Lesson 28: *Impact of Human Activities on Ecosystems*
- Lesson 29: *Sustainability Assessment of Technology*
- Lesson 30: *Prioritized Criteria for Addressing Hazards*

Physical Science (1 of 2)	**SCED ID:** 03 159 G 0912 0102	**Grades:** 9 - 12	**Availability:** June 2024

Course Description: Physical Science (1 of 2) explores the fundamental principles governing the natural world, from subatomic particles to the vastness of the universe. It delves into the electrical forces binding matter, employing Newton's Law of Gravitation and Coulomb's Law to predict interactions between objects. The course highlights the significance of molecular structures in material design and explains macroscopic energy phenomena through the motion and position of particles. Additionally, the curriculum addresses global challenges through physics principles and engineering design.

Materials Required: 3 rolls of pennies, 20 blank 3-inch-by-5-inch index cards, 30 cm of masking tape, plastic comb, woolen cloth, 1 teaspoon of salt, 1 teaspoon of sugar, 1-meter long string or thread, 2 balloons, 2 small bar magnets, 2 marbles of different sizes (one larger/heavier, one smaller/lighter), 2 toy cars with a noticeable difference in mass, A4 or letter-size paper (different types if available, such as printer paper, construction paper), aluminum foil, answer sheet, bar magnet, bottle caps, plastic lids (for wheels); camera, phone, or scanner; cardboard or plastic containers (for model car base); chargeable objects: plastic rods, balloons; computer, compass, disposable insulated cups (foam); dowels, skewers (for axles); drawing materials: paper, colored pens/pencils; digital writing tools, food thermometer (with a sharp metal probe), internet access, iron filings, lightweight can, masking tape, materials for an impact-absorbing front bumper material (for model car), objects made of various materials, paper, pencil, pen, periodic table of elements, piece of wool cloth or a wool sweater, physics formula sheet, plastic spoon, presentation (could be a poster, slides, or an article), ruler or tape measure, sand, scientific calculator; scissors, glue, tape (building tools), sheet of paper; sketching tools: pencils, erasers, paper; small amount of table salt and ground pepper; small box, plastic (car body); small, dense object like a key, rock, or metal nut; small pieces of paper; smooth, flat surface; spring or rubber band, spreadsheet, stopwatch, textbooks and online resources for research, Valence Electrons in the Periodic Table printable, velocity-vs.-time graph depicting the collision, word processing software

Improvements:

- 100% Alignment to NGSS Standards
- This course has interactive simulations providing students with engaging science concept connections.
- Performance-based activities have been created for each standard, including a Teacher Guide for the activities

Related Course Information / Delivery Date:

Physical Science (2 of 2)
Available Winter 2024

Course Scope and Sequence Physical Science (1 of 2)*

Unit 1: Chemical Bonds and Fundamental Forces

- Lesson 1: *Periodic Table Trends*
- Lesson 2: *Chemical Bonds*
- Lesson 3: *Electrical Forces*
- Lesson 4: *Forces and Particles*
- Lesson 5: *Gravitational and Electrostatic Forces*

Unit 4: Fields, Forces, and the Universe's Origin

- Lesson 15: *Invisible Forces*
- Lesson 16: *Field Interactions*
- Lesson 17: *Main Aspects of the Big Bang Theory*
- Lesson 18: *Evidence of the Big Bang Theory*

- Lesson 6: *Newton's Law of Gravitation and Coulomb's Law*

Unit 2: Molecules and Engineering Solutions

- Lesson 7: *Molecules and Materials*
- Lesson 8: *Molecules and Structure*
- Lesson 9: *Real-World Problems and Engineering Solutions*
- Lesson 10: *Solving Complex Real-World Problems*

Unit 3: Energy and Orbital Motion

- Lesson 11: *Macroscopic Energy*
- Lesson 12: *Energy in Motion*
- Lesson 13: *Gravitation and Orbital Motion*
- Lesson 14: *Laws of Planetary Motion*

Unit 5: Apply the Laws of Motion

- Lesson 19: *Newton's Second Law of Motion*
- Lesson 20: *The Law Variables*
- Lesson 21: *Qualitative Data*
- Lesson 22: *Quantitative Data*

Unit 6: Momentum, Mechanics, and Engineering Solutions

- Lesson 23: *Momentum*
- Lesson 24: *Objects in Motion*
- Lesson 25: *Design a Device*
- Lesson 26: *Data and Observations*
- Lesson 27: *Find a Solution*
- Lesson 28: *Criteria*

***** This is a tentative course outline and may be changed up to the date of release.