

New Science Courses for 2018

Biology A

Course Description

In this course, Biology A: Tracing Matter and Energy, students will study the formation of carbon-based molecules, organization of multicellular organisms, homeostasis, mitosis, cellular respiration, aerobic and anaerobic conditions, ecosystems, photosynthesis, impacts of human activity, and energy and mineral resources. Students will refine their science and engineering skills within the context of an engaging storyline to explain a phenomenon.

Course Objectives

This course aligns with the 2013 Washington State Science Standards (Next Generation Science Standards (NGSS)) for high school.

The course is organized by bundling the Performance Expectations into separate units within the course. (See Full Descriptions Narrative for unit content standards). Each unit is framed within a storyline that begins with an engaging, culturally relevant, authentic phenomenon. The lesson sequence helps students make sense of the phenomena and ultimately explain the phenomena. During the unit students engage in NGSS Science and Engineering Practices: (1) Asking Questions and Defining Problems (2) Developing and Using Models (3) Planning and Carrying Out Investigations (4) Analyzing and Interpreting Data (5) Using Mathematics and Computational Thinking (6) Constructing Explanations and Designing Solutions (7) Engaging in Argument from Evidence (8) Obtaining, Evaluating, and Communicating Information. This units will be framed with NGSS Crosscutting Concepts of: (1) Patterns (2) Cause & Effect (3) Scale, Proportion & Quantity (4) Systems & System Models (5) Energy & Matter (6) Structure & Function (7) Stability & Change.

Full Descriptions Narrative

Biology A: Tracing Matter and Energy is divided into 4 units. Unit 1 addresses the following NGSS Disciplinary Core Ideas (DCIs): LS1-6 Carbon, hydrogen, and oxygen from sugar re-combine to form amino acids and/or other carbon-based molecules, LS1-2* Organization of interacting systems within multicellular organisms to allow the organism to function, LS1-3* Feedback mechanisms maintain homeostasis, LS1-4* Cellular division (mitosis) and differentiation, LS1-7* Cellular respiration transfers energy b/c bonds of food and oxygen molecules are broken and bonds in new compounds are formed. Unit 2 addresses the following DCIs: LS1-5 Photosynthesis transforms light energy into stored chemical energy, LS1-2* Organization of interacting systems within multicellular organisms to allow the organism to function, LS1-3* Feedback mechanisms maintain homeostasis, LS1-7* Cellular respiration transfers energy b/c bonds of food and oxygen molecules are broken and bonds in new compounds are formed. Unit 3 addresses the following DCIs: LS2-3 Cycling of matter and flow of energy in aerobic and anaerobic conditions, LS2-4 Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem, LS2-5 Role of photosynthesis and cellular respiration in the cycling of carbon, LS2-6 Interactions in ecosystems in stable conditions and changing conditions. Unit 4 addresses the following DCIs: LS2-7 Reducing the impacts of human activities on the environment and biodiversity, ESS3-1 Human activity influenced by availability of natural resources, occurrence of natural hazards, and changes in climate, ESS3-2 Solutions for developing, managing, and utilizing energy and mineral resources, ESS3-3 Relationships among management of natural resources, the sustainability of human populations, and biodiversity, ESS3-4 Solution that reduces impacts of human activities on natural systems, ETS1-1* Analyze a major global challenge , ETS1-2* Design a solution to a complex real-world problem , ETS1-4* Use a computer simulation to model the impact of proposed solutions to a complex real-world problem, ETS1-3* Evaluate a solution to a complex real-world problem.

New Science Courses for 2018

Biology B

Course Description

In this course, Biology B: Tracing Information through Generations, students will study mitosis, transcription and translation, homeostasis, inheritance, genetic variation, population genetics, group behavior and survival, evolution, natural selection, adaptation, Earth's formation, Earth's systems and life on Earth, carrying capacity, biodiversity, impacts of human activity. Students will refine their science and engineering skills within the context of an engaging storyline to explain a phenomenon.

Course Objectives

This course aligns with the 2013 Washington State Science Standards (Next Generation Science Standards (NGSS)) for high school.

The course is organized by bundling the Performance Expectations into separate units within the course. (See Full Descriptions Narrative for unit content standards). Each unit is framed within a storyline that begins with an engaging, culturally relevant, authentic phenomenon. The lesson sequence helps students make sense of the phenomena and ultimately explain the phenomena. During the unit students engage in NGSS Science and Engineering Practices: (1) Asking Questions and Defining Problems (2) Developing and Using Models (3) Planning and Carrying Out Investigations (4) Analyzing and Interpreting Data (5) Using Mathematics and Computational Thinking (6) Constructing Explanations and Designing Solutions (7) Engaging in Argument from Evidence (8) Obtaining, Evaluating, and Communicating Information. This units will be framed with NGSS Crosscutting Concepts of: (1) Patterns (2) Cause & Effect (3) Scale, Proportion & Quantity (4) Systems & System Models (5) Energy & Matter (6) Structure & Function (7) Stability & Change.

Full Descriptions Narrative

Biology B: Tracing Information through Generations is divided into 5 units. Unit 1 addresses the following NGSS Disciplinary Core Ideas (DCIs): LS1-4* Cellular division (mitosis) and differentiation. Unit 2 addresses the following DCIs: LS1-1 DNA determines structure of proteins which carry out functions of life, LS1-3* Feedback mechanisms maintain homeostasis, LS3-1* Role of DNA and chromosomes in coding instructions for traits passed from parents to offspring, LS3-2* Genetic variations may result from: (1) meiosis, (2) replication errors (3) environmental mutations, ETS1-1* Analyze a major global challenge, ETS1-2* Design a solution to a complex real-world problem. Unit 3 addresses the following DCIs: LS3-3 Use statistics and probability to explain variation in traits in a population, LS3-1* Role of DNA and chromosomes in coding instructions for traits passed from parents to offspring, LS3-2* Genetic variations may result from: (1) meiosis, (2) replication errors (3) environmental mutations. Unit 4 addresses the following DCIs: LS2-8 Group behavior effects individual and species' chances to survive and reproduce, LS4-1 Evolution is supported by multiple lines of scientific evidence, LS4-2 Four factors of natural selection, LS4-3 Organisms with an advantageous heritable trait tend to increase in proportion, LS4-4 Natural selection leads to adaptation of populations, LS4-5 Environmental changes may result in a increased number of individuals, new species or extinction, ESS1-5 Theory of plate tectonics to explain the ages of crustal rocks, ESS1-6 construct an account of Earth's formation and early history, ESS2-7 Coevolution of Earth's systems and life on Earth. Unit 5 addresses the following DCIs: LS2-1 Factors that affect carrying capacity of ecosystems, LS2-2 Factors affecting biodiversity and populations in ecosystems, LS4-6 Mitigate adverse impacts of human activity on biodiversity, ETS1-3* Evaluate a solution to a complex real-world problem, ETS1-4* Use a computer simulation to model the impact of proposed solutions to a complex real-world problem.

New Science Courses for 2018

Chemistry A

Course Description

In this course, Chemistry A: Origin of the Elements and Material Science, students will study fission, fusion, and radioactive decay, properties of elements, simple chemical reactions, structure of substances and forces between particles, designing materials, life span of the sun, and the way stars produce elements. Students will refine their science and engineering skills within the context of an engaging storyline to explain a phenomenon.

Course Objectives

This course aligns with the 2013 Washington State Science Standards (Next Generation Science Standards (NGSS)) for high school.

The course is organized by bundling the Performance Expectations into separate units within the course. (See Full Descriptions Narrative for unit content standards). Each unit is framed within a storyline that begins with an engaging, culturally relevant, authentic phenomenon. The lesson sequence helps students make sense of the phenomena and ultimately explain the phenomena. During the unit students engage in NGSS Science and Engineering Practices: (1) Asking Questions and Defining Problems (2) Developing and Using Models (3) Planning and Carrying Out Investigations (4) Analyzing and Interpreting Data (5) Using Mathematics and Computational Thinking (6) Constructing Explanations and Designing Solutions (7) Engaging in Argument from Evidence (8) Obtaining, Evaluating, and Communicating Information. This units will be framed with NGSS Crosscutting Concepts of: (1) Patterns (2) Cause & Effect (3) Scale, Proportion & Quantity (4) Systems & System Models (5) Energy & Matter (6) Structure & Function (7) Stability & Change.

Full Descriptions Narrative

Chemistry A: Origin of the Elements and Material Science is divided into 3 units. Unit 1 addresses the following NGSS Disciplinary Core Ideas (DCIs): PS1-8 Nuclear and energy changes during fission, fusion, and radioactive decay, PS1-1* Properties of elements on the periodic table, PS1-2* Explain the outcome of a simple chemical reaction. Unit 2 addresses the following DCIs: PS1-1* Properties of elements on the periodic table, PS1-2* Explain the outcome of a simple chemical reaction, PS1-3* Structure of substances determined by forces between particles, PS2-6* Molecular-level structure is important in the functioning of designed materials, ETS1-3* Evaluate a solution to a complex real-world problem. Unit 3 addresses the following DCIs: ESS1-1 Life span of the sun and the role of nuclear fusion, ESS1-3 The way stars produce elements, PS1-2* Explain the outcome of a simple chemical reaction, PS1-3* Structure of substances determined by forces between particles, PS2-6* Molecular-level structure is important in the functioning of designed materials, ETS1-1* Analyze a major global challenge , ETS1-2* Design a solution to a complex real-world problem , ETS1-4* Use a computer simulation to model the impact of proposed solutions to a complex real-world problem.

New Science Courses for 2018

Chemistry B

Course Description

In this course, Chemistry B: Reactions, Energy, and Environmental Chemistry, students will study energy flow in a chemical reaction, factors affecting reaction rate, conditions affecting production of a reaction, mass conservation, second law of thermodynamics, changes to earth's systems, effect of energy flow on climate, properties of water, carbon cycling, climate change, and impacts of human activity. Students will refine their science and engineering skills within the context of an engaging storyline to explain a phenomenon.

Course Objectives

This course aligns with the 2013 Washington State Science Standards (Next Generation Science Standards (NGSS)) for high school.

The course is organized by bundling the Performance Expectations into separate units within the course. (See Full Descriptions Narrative for unit content standards). Each unit is framed within a storyline that begins with an engaging, culturally relevant, authentic phenomenon. The lesson sequence helps students make sense of the phenomena and ultimately explain the phenomena. During the unit students engage in NGSS Science and Engineering Practices: (1) Asking Questions and Defining Problems (2) Developing and Using Models (3) Planning and Carrying Out Investigations (4) Analyzing and Interpreting Data (5) Using Mathematics and Computational Thinking (6) Constructing Explanations and Designing Solutions (7) Engaging in Argument from Evidence (8) Obtaining, Evaluating, and Communicating Information. This units will be framed with NGSS Crosscutting Concepts of: (1) Patterns (2) Cause & Effect (3) Scale, Proportion & Quantity (4) Systems & System Models (5) Energy & Matter (6) Structure & Function (7) Stability & Change.

Full Descriptions Narrative

Chemistry B: Reactions, Energy, and Environmental Chemistry is divided into 3 units. Unit 1 addresses the following NGSS Disciplinary Core Ideas (DCIs): PS1-4 Release or absorption of energy from a chemical reaction, PS1-5 Effect of temperature or concentration on reaction rate, PS1-6 Conditions that produce increased amounts of products at equilibrium, PS1-7 Atoms (mass) are conserved during a chemical reaction, PS3-4 Second law of thermodynamics. Unit 2 addresses the following DCIs: ESS2-2 Changes to Earth's surface cause changes to other Earth systems, ESS2-4 Energy flow in Earth's systems can change climate, ESS2-5 Properties of water and its effects on Earth materials and surface processes, ESS2-6 Carbon cycling among the hydrosphere, atmosphere, geosphere, and biosphere, ESS3-5 Rate of global or regional climate change, ESS3-6 Relationships among Earth systems and impacts of human activity. Unit 3 addresses the following DCIs: ETS1-1* Analyze a major global challenge, ETS1-2* Design a solution to a complex real-world problem, ETS1-3* Evaluate a solution to a complex real-world problem, ETS1-4* Use a computer simulation to model the impact of proposed solutions to a complex real-world problem.

New Science Courses for 2018

Physics A

Course Description

In this course, Physics A: Wave Properties and Technology, students will study Newton's Law of Gravitation, Coulomb's Law, speed of waves, electromagnetic radiation and its effects on matter, technological devices, **Big Bang theory**, digital transmission and storage of information. Students will refine their science and engineering skills within the context of an engaging storyline to explain a phenomenon.

Course Objectives

This course aligns with the 2013 Washington State Science Standards (Next Generation Science Standards (NGSS)) for high school.

The course is organized by bundling the Performance Expectations into separate units within the course. (See Full Descriptions Narrative for unit content standards). Each unit is framed within a storyline that begins with an engaging, culturally relevant, authentic phenomenon. The lesson sequence helps students make sense of the phenomena and ultimately explain the phenomena. During the unit students engage in NGSS Science and Engineering Practices: (1) Asking Questions and Defining Problems (2) Developing and Using Models (3) Planning and Carrying Out Investigations (4) Analyzing and Interpreting Data (5) Using Mathematics and Computational Thinking (6) Constructing Explanations and Designing Solutions (7) Engaging in Argument from Evidence (8) Obtaining, Evaluating, and Communicating Information. This units will be framed with NGSS Crosscutting Concepts of: (1) Patterns (2) Cause & Effect (3) Scale, Proportion & Quantity (4) Systems & System Models (5) Energy & Matter (6) Structure & Function (7) Stability & Change.

Full Descriptions Narrative

Physics A: Wave Properties and Technology is divided into 3 units. Unit 1 addresses the following NGSS Disciplinary Core Ideas (DCIs): PS2-4 Newton's Law of Gravitation and Coulomb's Law and ESS1-4 Motion of orbiting objects in the solar system. Unit 2 addresses the following DCIs: PS2-5 Electric current produces a magnetic field and a changing magnetic field produces an electric current. Unit 3 addresses the following DCIs: PS4-1 Relationships among frequency, wavelength, and speed of waves, PS4-3 Electromagnetic radiation as a wave model or a particle model, PS4-4 Effects of different frequencies of electromagnetic radiation on matter, **ESS1-2 Big Bang theory based on astronomical evidence**, PS4-5 Technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy, PS4-2 Advantages of using a digital transmission and storage of information, ETS1-1* Analyze a major global challenge, ETS1-2* Design a solution to a complex real-world problem, ETS1-3* Evaluate a solution to a complex real-world problem, and ETS1-4* Use a computer simulation to model the impact of proposed solutions to a complex real-world problem.

New Science Courses for 2018

Physics B

Course Description

In this course, Physics B: Mechanics in the Earth Solar System, students will study energy changes and flow, energy associated with motion and relative position, conversion between forms of energy, formation of continental and ocean-floor features, cycling of matter, Newton's Second Law of motion, conservation of momentum, collisions, the relationship between electric currents and magnetic fields, and motion of orbiting objects. Students will refine their science and engineering skills within the context of an engaging storyline to explain a phenomenon.

Course Objectives

This course aligns with the 2013 Washington State Science Standards (Next Generation Science Standards (NGSS)) for high school.

The course is organized by bundling the Performance Expectations into separate units within the course. (See Full Descriptions Narrative for unit content standards). Each unit is framed within a storyline that begins with an engaging, culturally relevant, authentic phenomenon. The lesson sequence helps students make sense of the phenomena and ultimately explain the phenomena. During the unit students engage in NGSS Science and Engineering Practices: (1) Asking Questions and Defining Problems (2) Developing and Using Models (3) Planning and Carrying Out Investigations (4) Analyzing and Interpreting Data (5) Using Mathematics and Computational Thinking (6) Constructing Explanations and Designing Solutions (7) Engaging in Argument from Evidence (8) Obtaining, Evaluating, and Communicating Information. This units will be framed with NGSS Crosscutting Concepts of: (1) Patterns (2) Cause & Effect (3) Scale, Proportion & Quantity (4) Systems & System Models (5) Energy & Matter (6) Structure & Function (7) Stability & Change.

Full Descriptions Narrative

Physics B: Mechanics in the Earth Solar System is divided into 2 units. Unit1 addresses the following NGSS Disciplinary Core Ideas (DCIs): PS3-1 Energy changes and energy flow in and out, PS3-2 Energy at the macroscopic scale = energy associated with motion and relative position of particles (objects), PS3-3 Convert one form of energy into another form of energy, PS3-5 Objects interacting through electric or magnetic fields changes the forces and energy , ESS2-1 How Earth's internal and surface processes form continental and ocean-floor features, ESS2-3 Cycling of matter by thermal convection. Unit 2 addresses the following DCIs: PS2-1 Newton's second law of motion = relationship among net force, mass, and acceleration, PS2-2 Momentum is conserved when there is no net force, PS2-3 Minimize the force on an object during a collision.