Curriculum
A Blended Approach

Star Academy uses a custom-designed core curriculum revolving around hands-on, project-based interactive lessons that expose students to over 50 careers. The program is tailored to meet state standards. Cross-curricular learning and skill support are the foundation of the Star Academy approach.

Star Academy is built around robust, CORE-driven curricula for science, math, English Language Arts, and social studies. You'll find a detailed listing of specific subject matter at the end of this brochure.

Our curricula combine Modules, Individualized Lessons, Math Connections, Blended Science, and Living Curriculum units of study.

Modules: Collaborative, hands-on experiences that last 7-10 days. These multimedia modules reinforce learning through real-world application, and include paired and individual instruction and assessments. Math, science and social studies classrooms employ modules.

Individualized Prescriptive Lessons (IPLs): These lessons provide mastery-based mathematical learning in the context of relevant story lines. Lessons are 45 minutes in length and include instructional text, audio, graphical interactions and assessments.

Math Connections and Blended Science: Teacher-led, small group activities designed to provide students the opportunity to apply concepts learned during computer-based instruction.

- Math Connections are 45-90 minutes in length and serve as the initial hands-on learning for students.
- Blended Science activities are delivered in one-week sessions throughout the year and use questions as springboards for applying the scientific method across disciplines.

Living Curriculum Units: Nine-week experiences that provide organic cross-curricular learning and provide opportunities for service learning. These activities are continually evolving and reflect the needs of students, schools, and their communities at large.

Expeditions: Student-managed, collaborative and paired activities designed to help connect mathematical practices to content through an exploration of essential questions.

Quests: Student-directed curricula bringing a project-based component to English Language Arts. Students experience a full-class, teacher-led curriculum, along with individual journaling activities and small group projects.

iLearn: This prescriptive, individualized math program starts each student at their earliest gap, then precisely matches instruction to each student's unique content needs, based on detailed diagnostic assessments. Students skip what they know and learn just what they need to succeed.

Social Studies

- Geography
- US History
- World History
- Civics
- Economics
  - TCI
  - Modules
  - Expeditions

Science

- Physical Science
- Life Science
- Earth Science
- Integrated Science
- Biology
  - Modules
  - Blended Science

English Language Arts

7th Grade Tier II Intervention

8th Grade Tier II Intervention

English I Tier II Intervention

- Voyager
- Quests
- Modules

Math

7th Grade Math

8th Grade Math

Foundations of Algebra

Algebra I

- Modules
- Expeditions
  - IPLs
  - Math Connections
  - iLearn

Modules

Collaborative, hands-on experiences that last 7-10 days. These multimedia modules reinforce learning through real-world application, and include paired and individual instruction and assessments. Math, science and social studies classrooms employ modules.

Session 1	Session 2	Session 3	Session 4	Session 5	Session 6	Session 7	
Student log in	Student log in	Student log in	Student log in	Student log in	Student log in	Student log in	
Curriculum Guide & Reading Time	Research, Challenge, & Application	Research, Challenge, & Application	Research, Challenge, & Application	Research, Challenge, & Application	Curriculum Test Review	Post Test & Reading Time	
Cooperative Learning	Cooperative Learning	Cooperative Learning	Cooperative Learning	Cooperative Learning	Cooperative Learning	Cooperative Learning	Discovery Days • Held every eight class sessions • Teacher directed • Whole class participation • Enrichment opportunity
Enrichments	Enrichments	Enrichments	Enrichments	Enrichments	Enrichments	Enrichments	
Student log out	Student log out	Student log out	Student log out	Student log out	Student log out	Student log out	

Module Descriptions

Alternative Energy

In Alternative Energy, students explore the basic concepts of energy as well as the law of conservation of energy. Information is presented about renewable and nonrenewable energy sources and how these resource types are important for meeting global energy demands. The advantages and disadvantages of alternative energy forms such as solar, wind, biomass, geothermal, and hydropower are presented. Hands-on experiences include experiments with a wind turbine, solar cells, and hydrogen fuel cells.

Animals

In Animals, students learn classification systems and the place of animals (including humans) within them. Students explore physical and lifestyle characteristics of invertebrates and vertebrates through hands-on activities. They compare organisms in terms of adaptations such as symmetry, movement, and organ systems. They explore the transition to land and temperature regulation. They are introduced to concepts of evolution and the fossil record.

Appplied Physics

In Applied Physics, students learn about the wonderful forces of nature that they must control and learn to live with to make their lives more enjoyable. Using an air track, students learn about motion by calculating the velocity and acceleration of air track cars using a photogate timer. Students study data transmission using a laser. Students also learn about radio waves, light, and heat and do experiments using mathematics.

Aquaculture

In Aquaculture, students learn fish biology, care, and management by maintaining their own goldfish tank. After an introduction to the history of aquaculture, they conduct chemical tests of tank water, learn fish anatomy and metabolism, calculate fish growth and productivity, and maintain records of their activities. Along the way, they learn the processes involved in a large-scale aquaculture operation and consider environmental impacts of aquaculture.

Astronomy

In Astronomy, students learn about the solar system and their relationship to it from a mathematical perspective. They investigate the Sun-Moon-Earth system and the characteristics, sizes, and distances of planets in the solar system. They construct a small refracting telescope and learn how it functions. They explore gravity and orbits, distinguish between weight and mass, and relate the kinetic energy equation to crater impacts.

Biotechnology

In Biotechnology, students explore the past, present, and future of biotechnology. Through hands-on activities, computer simulations, and laboratory experiments, they investigate the structure of the DNA molecule and learn how it can be changed through genetic engineering, including recombinant DNA, gene splicing, and transgenic biotechnology. They consider some implications of using biotechnology in medicine, agriculture, and other fields.

Body Systems

In Body Systems, students explore the structure and functions of the 11 body systems. They measure functions and characteristics of their own bodies including respiration rate, CO2 production, binocular vision, length of the digestive tract, and pulse rate. Students learn the hierarchy of organization within their own bodies and how body systems work together to maintain homeostasis.

Carbon Footprint

Carbon Footprint introduces students to greenhouse gases and global warming. They learn about carbon as an element and as a part of compounds. They learn what fossil fuels are and where they came from. They also learn about the natural carbon cycle and the effects people have on it. Students learn factors that are included in a carbon footprint and how to measure their own carbon footprint. Students learn what they can do to lessen their negative impact on the environment.

Cell Structure

In Cell Structure, students discover the structure and function of the living cell by doing a variety of hands-on activities. They learn proper techniques of microscope use. They observe prepared slides of cells and tissues, make wet-mount slides of living cells, and compare plant and animal cells. They do a naked-egg experiment to demonstrate osmosis across a semipermeable membrane. They use cell models to identify plant and animal cell organelles.

Changing Oceans

Changing Oceans first introduces students to general characteristics of oceans (such as salinity, depth, and layers) and to the variety of ocean organisms and their

habitats. Then, students look at specific ocean-related problems and crises, including overfishing; ocean pollution; global warming; and exploitation of ocean minerals, metals, and energy. In addition to describing the problems, Changing Oceans concentrates on two factors: relating the problem directly to students and brainstorming current or potential solutions to the problem.

Chemical Math

Are you curious how chemists determine what to put together and just what quantity to use when making things such as perfume or medicine? In Chemical Math, students see the math that chemists use on a daily basis. Students balance equations, solve inequalities, use scientific notation, and learn basic chemistry concepts. Students use Avogadro's number and create Lewis dot structures of atoms. In Chemical Math, the numbers behind chemistry are the focus.

Climate & Biomes

In Climate & Biomes, students learn what climate is, what processes drive it, and how we measure both past and present climates. They locate and describe Earth's major biomes (large ecological systems), relate biomes to climatic zones, and demonstrate concepts such as the greenhouse effect, albedo, and global warming. Climate & Biomes enables students to practice higher-level scientific thinking, such as using models, recognizing types of evidence, and developing informed opinions.

Climate Change

The 2007 Intergovernmental Panel on Climate Change (IPCC) Report describes causes, effects, and ways of dealing with climate change resulting from global warming. In Climate Change, students are introduced to the IPCC Report. They learn the effect of carbon dioxide and other greenhouse gases on global temperature increase. Then, they use graphing, polynomials, and matrices to analyze data from the report and develop possible carbon mitigation strategies.

Composites

Composites are natural and synthetic materials consisting of two or more distinctly separate materials. Composites is focused on learning what composite materials are, where they are used, why they are used, and how they are made and on testing their properties. Students create composite test samples using various materials and perform stress tests to evaluate various composite materials.

Confident Consumer

In Confident Consumer, students use problem-solving techniques to complete activities related to consumer education. Students calculate unit prices, evaluate sales and discounts provided by vendors, calculate the most economical way to purchase food and drinks for a party of 25, evaluate products based on strength and absorbency, and much more. Percents, ratios, and proportions are use extensively throughout this curriculum title.

Dynamic Earth

In Dynamic Earth, students gain a scientific understanding of the processes that shape our planet. Students construct a scale model of Earth's interior, calculate the epicenter of an earthquake, create and read a topographic map, and use a shaker table to simulate an earthquake's destructive force. They explore the history and evidence behind continental drift and the theory of plate tectonics.

Eco-Architecture

Eco-Architecture enables students to explore sustainable construction methods that designers and engineers use currently. Students learn how to evaluate the benefits and drawbacks of building materials based on the Six-Question Sustainability Test. They learn the importance of building for sustainability and learn why we need to reduce, reuse, recycle, and rethink when planning for new construction. Ultimately, students design and create their own Eco-home that represents choices they have made about designing with the environment in mind.

Ecology

In Ecology, students explore basic concepts and processes underlying the function of natural ecosystems. They consider biotic and abiotic factors; energy flow through food webs; nutrient cycles; population interactions including population growth, carrying capacity, and predator-prey interactions; biodiversity; and humans as part of ecological systems.

Electricity

In Electricity, students learn the principles of electricity and draw a schematic of a parallel and a series circuit. Students complete a series and a parallel circuit as well as classify conductors and insulators. They use a voltage and ohm meter, and they identify the magnetic fields important to the concept of electricity. Students also measure voltage, resistance, and current during Electricity activities.

Energy, Power, & Mechanics

When students complete Energy, Power & Mechanics, they have a basic understanding of energy sources, the principles of power technology, and the concept of mechanical advantage and machines. Students see how fluids can be used with other simple machines. Using educational instruments, students learn the fundamentals of gears, fluid mechanics, and three classes of levers. Students also use a solar hot dog cooker and experience the concept of wind power.

Engineering Bridges

In Engineering Bridges, students solve an engineering problem as a team. Their task is to build a balsa wood bridge that will span a space and hold the most weight before breaking. There are certain rules that the students must follow to build their bridges correctly. Students learn the relationships among design, structure, and strength of a bridge. By building a bridge and testing its strength on a structure tester, students learn valuable engineering concepts and principles.

Environmental Issues

In Environmental Issues, students use multimedia and hands-on activities and experiments to explore pollution, loss of habitats and biodiversity, resource use, waste management, global climate change, and human population growth. They learn statistics related to these issues and do activities relating to acid rain, paper recycling, resource use, oil-spill cleanup, and global warming.

Factoring & Polynomials

In Factoring & Polynomials, students will learn about different types of polynomials and how to identify and write monomials, binomials, and trinomials. Students examine prime and composite numbers and polynomials. Students will learn to factor and solve quadratic equations using the Distributive Property and the FOIL method. Students will learn to graph polynomials, use factors in graphing, and graph quadratic and special equations.

Fitness & Health

In Fitness & Health, students explore the basics of personal fitness and learn how to keep their bodies fit both inside and outside. They begin by analyzing their own fitness level. They learn ways to measure and improve cardiovascular and muscular fitness. They learn the basics of proper nutrition and the proper care of hair, skin, and teeth. Finally, based on what they have learned, they develop a plan to improve and maintain their own fitness.

Food Science

In Food Science, students examine the six main nutrients. They conduct experiments demonstrating the concepts introduced in Food Science. Students use laboratory equipment such as an electronic balance, graduated cylinders, test tubes, and beakers. Students also write a laboratory report for each experiment conducted during the course of Food Science.

Forces

In Forces, students explore forces and how they affect the motion of objects. Students learn to describe and measure the motion of objects by completing distance, time, speed, and velocity measurement activities. Students use examples they already find relevant to learn about various forces. They describe and measure the changing motion of accelerating objects and observe the direction of motion and how radius affects centripetal acceleration.

Forensic Math

In Forensic Math, students discover the “numbers” behind crime scene investigation. They use algebra in determining the approximate height of both suspects and victims, in calculating the turning diameter of a vehicle, and in computing the velocity of a car. Students use the concepts of slope, y-intercept, functions, and equations to complete a crime scene data analysis.

Forensic Science

In Forensic Science, students determine the prime suspect in a fictitious vandalism of a local high school. Students analyze evidence, which includes fingerprints, hair samples, handwriting, and ink. Students also extract DNA from a sample. Students compare the evidence with samples taken from suspects. Finally, they must put all the evidence together and identify a prime suspect. Teachers may customize suspect samples and evidence, just to keep it interesting!

Future Fuels

In Future Fuels, students determine how the Sun is the source for all energy we use on Earth. Future Fuels explores the need to find replacements for fossil fuels. Students investigate the concepts of renewable and nonrenewable resources and how these types of resources affect the environment. They will explore and compare several alternative energies including wind, geothermal, and hydropower.

Garbology

In Garbology, students learn about the history of waste material and what people can learn from studying it. Garbology also covers different kinds of waste and how each kind is classified. Students explore the extent and causes of the waste problem as well as waste-management techniques, including landfills, incineration, and gasification. Students also learn about the waste problem and how the cradle-to- cradle method of design is a promising long-term solution for the problem of waste.

Genetics

In Genetics, students learn genetics terminology and simulate breeding experiments similar to Gregor Mendel's. They construct models of chromosomes and DNA. Students create Punnett squares and determine probabilities of offspring given specific parent genotypes. They complete a dihybrid cross and a natural selection experiment.

Geometric Packing

In Geometric Packing, students explore surface areas and volumes of various objects by packing materials. They explore spatial relationships and tessellations by transformations and the use of mathematical software. Students are introduced to the concept of slope, have tactile explorations of spherical packing, and find applications of Pascal's Triangle. They use the Fibonacci sequence to understand the greatest common divisor and the least common multiple. Finally, they investigate mathematical history by using ancient Egyptian algebra to find the golden ratio and explore the Pythagorean Theorem by building a scale replica of the Pyramid of Giza.

Gravity

In Gravity, students explore the velocity of falling objects using a picket fence and timer. Students use a photogate and computer software to explore velocity and acceleration of falling objects; they gather, graph, analyze, interpret, and apply experimental data; and they determine the acceleration of gravity. Students use an air track to perform experiments related to potential and kinetic energy.

Gravity of Algebra

In Gravity of Algebra, students will interpret data from a free-fall experiment by applying mathematical concepts such as direct and inverse variations, scatter plots, and slope. They will use the point-slope and y-intercept forms of a line to create a mathematical representation of the data and calculate the acceleration due to gravity. Students will also use graphing skills to learn the relationship between the kinetic and the potential energy of a falling object and explore the Law of Conservation of Energy.

Green Machines

According to the Best Foot Forward group, the average American's carbon footprint shows 34% of the emissions produced are accounted for by personal travel. In Green Machines, the effects of personal travel and the transportation of goods on the environment are examined. While it would be unrealistic to imagine eliminating travel from our society, we can make smart buying choices regarding cars and fuel. Car types, car companies, fuel types, and alternative methods of travel are identified and examined. The focus of Green Machines is environmental health.

Heart Fitness

In Heart Fitness, students cover factors affecting heart fitness, particularly diet and exercise. They monitor and record blood pressure and heart rate, identify heart structures, and describe the path of blood through the circulatory system. They monitor their own diet and relate it to heart fitness. They study symptoms of cardiovascular disease and learn how diet, lack of physical activity, and smoking relate to the development of cardiovascular disease.

Heat & Energy

In Heat & Energy, students learn definitions of concepts related to heat and energy, including temperature, potential and kinetic energies, and work. They look at heat and energy from the molecular viewpoint as they construct models of simple hydrocarbon fuels. Students learn the chemical reaction involved in combustion and the components necessary for combustion to occur, and they distinguish examples of exothermic and endothermic reactions.

Home Makeover

When students complete Home Makeover, they will have an understanding of how to preplan for remodeling a home. Students design an addition to a home by calculating area, selecting materials, and computing overall costs. Students determine square feet, square yards, and the volume of a cylinder as they relate to homes and home remodeling. This curriculum title enables students to study many of the concepts used by those who remodel professionally.

Horticulture

In Horticulture, students briefly explore important subfields of horticulture and then delve into the processes of growing and maintaining their own plants, including germinating plants, making cuttings, and growing plants in both soil and hydroponics media. They explore plant classification, structure, and reproduction. They are introduced to the forestry industry, tree identification, and ecology and conservation concerns in horticulture and forestry.

Hotel Management

In Hotel Management, students trace the earliest types of lodging establishments in America. They explore the day-to-day responsibilities of running a hotel and examine the following hotel areas: front desk, hotel accounting, housekeeping, engineering and maintenance, and hotel security. They learn that each component is necessary to successfully run a hotel. Students utilize math skills by calculating occupancy rates, RevPAR, ADR, room rates, and room discounts. Students use percentages, decimals, ratios, and proportions.

Immunology

During Immunology, students explore the anatomy and physiology of the immune system. Students also explore different microscopic portions of the immune system and the pathogens it fights using digital microscopy. They use a mobile device to explore and use medical terminology to describe the causes, prevention, effects, treatments, and various other aspects of diseases, especially those that relate to the immune system. During the course of the seven sessions, students engage in digital microscopy, modeling, and personal risk assessment related to immunology.

Laser Geometry

In Laser Geometry, students use algebra and geometry to explore different mathematical concepts including exponents, scientific notation, angles, and waves. Students conduct experiments to investigate interior and exterior Heisenberg's Uncertainty Principle; and transverse, longitudinal, and surface waves. Finally, they explore degrees of angles by using a game controller to create an inexpensive, interactive whiteboard and by manipulating the direction of laser beams to piggyback a radio signal to a receiver.

Lenses & Optics

In Lenses & Optics, students will use the focal length of a lens to solve rational equations. Students will gather information by performing an activity to determine lens optic measurements and then graph the measurements. Students will perform an experiment to discover the relationship between the object height and the image height, which is used to define the magnification ratio. Students create a slide projector and discover how lenses are made to correct vision problems.

Light & Lasers

In Light & Lasers, students explore aspects of light and lasers and see how that technology can be used. Students use geometric concepts to divide and reflect a laser beam along a path and to create a security system utilizing the beam. Light is explored and manipulated through experiments that use lenses, prisms, filters, and intensity meters. The data from these experiments is analyzed and interpreted to provide a clear picture of the nature of light.

Material Science

In Material Science, students explore the basic structure and properties of various materials through hands-on activities and experiments. They conduct experiments to test the conductivity of materials and the difference between insulators and conductors of electricity. Students use an atomic building game board to construct a specific atom. The data from the experiments and activities in Material Science aid the students in understanding materials around them in day-to-day living.

Math Behind Your Meals

In Math Behind Your Meals, students will relate algebraic terms and algorithms to tangible examples – in this case, the foods they consume. They will use basic operations and properties to evaluate expressions as they analyze meals from the production to the ingestion phases. They will substitute values for variables to determine how they can get the most nutritional value for their food dollars. They will calculate percent of change to find how much fast food costs today compared to past prices. They will learn how food advertising and marketing relate to portion sizes. They will solve proportions relating to portion sizes and calorie and fat content. They will also calculate the price of food over-consumption as it relates to health care costs and obesity.

Microbiology

In Microbiology, students learn classification systems and characteristics of bacteria, protistans, and fungi. They culture and identify bacterial colonies and observe living protistans and fungi. They distinguish

between simple prokaryotic and more complex eukaryotic cells. They learn microscope use, measure microscopic organisms, and calculate actual sizes of microorganisms based on their magnification.

Mission to Mars

Mission to Mars integrates the concepts of green living into the current research being conducted for a planned mission to the planet Mars. Using a Mars mission as a microscale ecosystem, Mission to Mars explores the green topics of water conservation, food availability, energy needs, global warming, and ozone depletion, to name a few. Students will be given the opportunity to identify and solve many of the problems of a mission to Mars and see how those solutions can also apply to many of the environmental challenges that are faced here on Earth.

Natural Disasters

In Natural Disasters, students briefly explore various categories of natural disasters. They learn the scientific concepts underlying the cause and the general effects of each disaster, as well as locations in the US and around the world where each type of disaster is most likely to strike. They do activities to demonstrate both scientific concepts and methods of measuring and tracking the process. Finally, they develop a school disaster plan based on given conditions.

Nuclear Energy

In Nuclear Energy, students learn about the basics of energy, atomic structure, the periodic table, binding energy, fission, nuclear reactors, and radioactivity. Students graph equations related to energy, rational functions related to Coulomb's Law, equations containing powers and roots, and rational equations relating to radioactivity. Also, using the graphing calculator, students analyze inequalities, evaluate data in a table form, and calculate various aspects of radioactivity using rational equations. Finally, students use the simulation software Nuclear Power Plant to attempt to successfully operate a nuclear power plant.

Oceanography

In Oceanography, students locate oceans and explore the topography of the ocean floor. They do several experiments and activities to understand salinity, density, conductivity, and pressure changes in the oceans and to explore the actions of waves and currents. They survey the organisms found in several ocean habitats and consider the ways in which humans use and abuse the oceans. They do several types of mathematical calculations related to ocean properties.

Organism Reproduction

During the course of Organism Reproduction, students learn how different organisms reproduce, starting with the simplest of all organisms, bacteria, and ending with humans, the most complex organisms. Students explore asexual and sexual reproduction processes involving organisms from each of the five kingdoms. Students investigate both the mitosis and meiosis processes. Students research inherited diseases caused by abnormal genes.

Plants & Pollination

In Plants & Pollination, students fit plants into the five-kingdom classification system and learn the importance of plants on Earth. They are introduced to the structure and function of plant cells and tissues. They learn the functions of roots, stems, and leaves and cover plant processes including photosynthesis, respiration, and transpiration. They also look at plant pollination and reproduction and the difference between monocots and dicots.

Plastics & Polymers

In Plastics & Polymers, students explore several types of polymers, including plastics. The students explore the basic concepts of atoms, molecules, and compounds. This enables students to better understand the properties of the plastics and polymers they create and manipulate. Students create, mold, recycle, and form various polymers. These activities provide a better understanding of the usefulness and limitations of the materials.

Population Perspectives

In Population Perspectives, students will explore the field of demography, or the study of human populations, learning how demographers use algebra to analyze the growth and changing composition of populations. They will analyze and solve population growth equations, compare census taking with population sampling, compare population sizes at different growth rates, construct polynomials related to age cohorts of populations, and compare populations in more developed and less developed countries. They will use the graphing calculator to graph and solve exponential and quadratic equations.

Projectile Motion

In Projectile Motion, students build and launch straw rockets in order to observe how flying objects follow a

curved path called a parabolic path. Students predict the launch angle that will make the straw rocket travel the greatest horizontal distance and test the predictions. Students learn the general form of a quadratic equation, identify the coefficients in a quadratic equation, and use the coefficients in a quadratic equation to predict the shape of a parabola. Students predict where the straw rocket will land using a quadratic equation that describes the straw rocket's path.

Properties of Math

In Properties of Math, students first build the number system from the ground up by exploring set theory and using tiles to explore the density of the real numbers. They are then introduced to the order of operations and properties and ordering of rational numbers through a series of explorations using activities on mathematical software. Students learn relationships between prime factorizations and quotients of integers while relating all ideas to the rational number system. Finally, all concepts are brought together by solving problems using multistep operations.

Reactions

In Reactions, students experience and perform chemical processes that contribute to their general understanding of basic chemical principles, the reasoning for classifying reactants and products into specific groups, and the methods involved for mathematically interpreting the results. Practical, familiar examples of chemical reactions are used throughout Reactions to enhance the student realizations of the importance of chemistry.

Rocket Science

In Rocket Science, students learn about the scientific principles of flight, propulsion, and aerodynamics Newton's laws of motion are introduced and explained in practical terms. The history of rocket science is an important concept in understanding the development of rockets and is presented during Rocket Science. Students construct a water-fueled Stratoblaster® rocket and launch it as a culminating activity.

Rocketry & Space

In Rocketry & Space, students learn about the development of rocketry and the United States space program and its history. The principles of rocket design, propulsion, and certain scientific principles that are fundamental to successful rocket flight are important concepts in Rocketry & Space. Students construct and launch a model rocket as a means of bringing application to the scientific concepts presented.

Rocks & Resources

In Rocks & Resources, students study the rock cycle and learn characteristics of the three basic rock types. They learn and observe properties of minerals, including hardness and fluorescence, in more detail. They review examples of how rocks and minerals are used as nonrenewable resources. They review different types of mining and learn why mining is essential to civilization. They also learn how it affects the environment, using Picher, Oklahoma, as a case study. Finally, they look at potential future mining trends, including deep-sea mining.

Simple Machines

In Simple Machines, students explore how work, force, energy, and machines make moving objects easier through the use of the computer and hands- on activities. Students use variables and equations to describe the principles of simple machines. Students use the information they learn about simple machines to design a compound machine that moves an object.

Soils

In Soils, students explore the role soil plays in agriculture and in our survival as a species on this planet. Students learn about soil formation, soil chemistry, and sustainable agricultural practices used to conserve, as well as increase, the productivity of soil. They participate in experiments that determine the characteristics of an agriculturally productive soil and show the importance of the relationship among soil, water, air, and living organisms.

Sports Statistics

In Sports Statistics, students explore the role of mathematics in sports statistics. Students will use actual professional sports data to find trends and make decisions. Students will also collect data from their own tabletop sports and complete analyses on the data. They will explore many different mathematical concepts including matrices, graphing, factorials, permutations, and combinations.

Statistical Analysis

While engaged in Statistical Analysis, students create and conduct a survey and graph their data. They learn to calculate measures of central tendency and range. Students explore histograms, box-and- whisker plots, stem-and-leaf

plots, bar graphs, circle graphs, and line graphs and use them to display statistical information. Students also complete probability activities ranging from tossing two- color counters and rolling dice to generating and using Pascal's Triangle to calculate experimental and theoretical probabilities. Students use their knowledge of probability to create a fair game.

Supply & Demand

In Supply & Demand, students will learn about the Law of Supply and Demand and how it affects their lives. They will use graphing skills and learn multiple methods of solving systems of equations to determine the equilibrium price and quantity of a given product. Finally, students will use their ability to solve systems of equations to manage a simulated business.

Sustainable Agriculture

In Sustainable Agriculture, students explore issues facing today's farmers and ranchers. Topics such as soil composition, the water cycle, animal care and the use of genetically engineered hormones, and farming technology are covered in Sustainable Agriculture. Students explore the concept of urban farming and how large cities are creating ways to grow their own food locally. Throughout Sustainable Agriculture, students grow plants in various types of soil and draw conclusions about what type of soil produces the best plant growth.

The Universe

To study a topic as big as the universe, you need big numbers! In The Universe, students use positive and negative exponents to calculate star magnitudes and scientific notation to calculate sizes and distances of the stars and galaxies beyond our own solar system. They also explore concepts of probability to consider the likelihood of other planets containing life and civilization.

Water Management

In Water Management, students explore the hydrologic cycle, the uses of water, types of water pollution, and the design and function of water treatment plants. They use a River Tank to estimate surface area and volume of water in a water body and to calculate flow rate. They use a watershed model to simulate runoff, groundwater activity, and pollution. They also calculate a water budget for a family, use a variety of graphs, and consider methods of water conservation.

Water Quality

In Water Quality, students complete an internship with Scientific Laboratory Services. As part of their internship, students will analyze various standards and regulations relating to water quality and use. Through laboratory testing and activities, students will experience real-world applications of inequalities and learn to solve and graph simple, multistep, and compound inequalities using both paper and pencil and a graphing calculator.

Unsolved Mysteries

In Unsolved Mysteries, students will use functions and coordinate graphing in determining who committed a fictional crime. Using cell phone records and coordinate graphing, students will identify an area in which a stolen cell phone was last operated. Students will also use functions to estimate the time of the robbery as well as the approximate height of the suspect. Students will link algebra skills to a real-world career in forensic science.

Weather

Weather begins from a global perspective by explaining circulation and weather patterns and moves to local weather system investigation. Students see the relevance of Weather daily as their local weather conditions change. They learn how their local weather is predicted, or forecasted, on the news and how global weather patterns can influence their everyday lives. They use a computerized weather station to monitor daily weather data such as temperature, pressure, and wind direction.

Weights & Measures

How many ounces of popcorn are contained in that large tub at the local multiplex? How many ounces of soda in the large cup? These are questions students answer as they learn about Weights & Measures. Students also learn to convert from international units to customary units of measurement and temperature, using both dimensional analysis and formulas along the way.

Where in the World

In Where in the World, students explore from Eratosthenes to GPS to see how mathematics is used in mapping the world in which we live. Students complete activities that utilize algebraic concepts such as solving radical expressions, the Pythagorean Theorem, and the Distance Formula while exploring the history of mapmaking from ancient tools to global positioning. Students will create a Mercator projection, use trilateration to determine distances, and use a GPS unit to calculate distances between locations.

Math Components

Expeditions

Cloud-based Expeditions were developed with the Common Core State Standards Initiative and are designed to help connect mathematical practices to mathematical content. Each Expedition begins with an Essential Question, which sets the focus and shapes students' thinking. The overall goal is to create robust mathematical thinkers by engaging learners with the subject matter.

Expeditions blend teacher-led instruction with student-directed, collaborative activities. These activities guide student exploration through hands-on discovery and experimentation. Activity resources are delivered in various forms including interactive content, and videos give instruction, relate procedures, teach concepts, and provide opportunities for practice.

Fundamental to the Expeditions learning process are the 21st-century learning skills of collaboration and teamwork. Students collaborate in pairs and in teams as they seek to answer their Essential Question while recording data in logbooks and data sheets to authenticate their learning.

Using Expeditions as a vehicle, students learn the important processes and proficiencies in mathematics education. This curriculum ensures that teachers can teach and that students will develop the mathematical expertise that will benefit them in college and beyond.

Sample Math Expedition – Running Well Thief

ESSENTIAL QUESTION:

How should mathematical data be used as evidence to convict a suspect of a crime?

During this Expedition students will:

- Conduct experiments by analyzing data and drawing conclusions.
- Graph the results of your experiments.
- Build functions and write equations to represent your functions.

DESTINATION 1

Crime Scene Observations

Tasks/Resources:

- Create an initial theory.

DESTINATION 2

Blood Spatter Analysis

Tasks/Resources:

- Conduct experiments by analyzing data and drawing conclusions.
- Graph the results of your experiments.
- Build functions and write equations to represent your functions.

DESTINATION 3

Shoe Print Analysis

Tasks/Resources:

- Gather shoe length vs height data.
- Analyze shoe length data.
- Develop shoe print conclusion.

DESTINATION 4

Gathering Cooling Evidence

Tasks/Resources:

- Perform coffee-cooling experiment.
- Analyze coffee-cooling rates.
- Develop a cooling curve conclusion.

DESTINATION 5

Final Theory

Tasks/Resources:

- Develop a final theory.

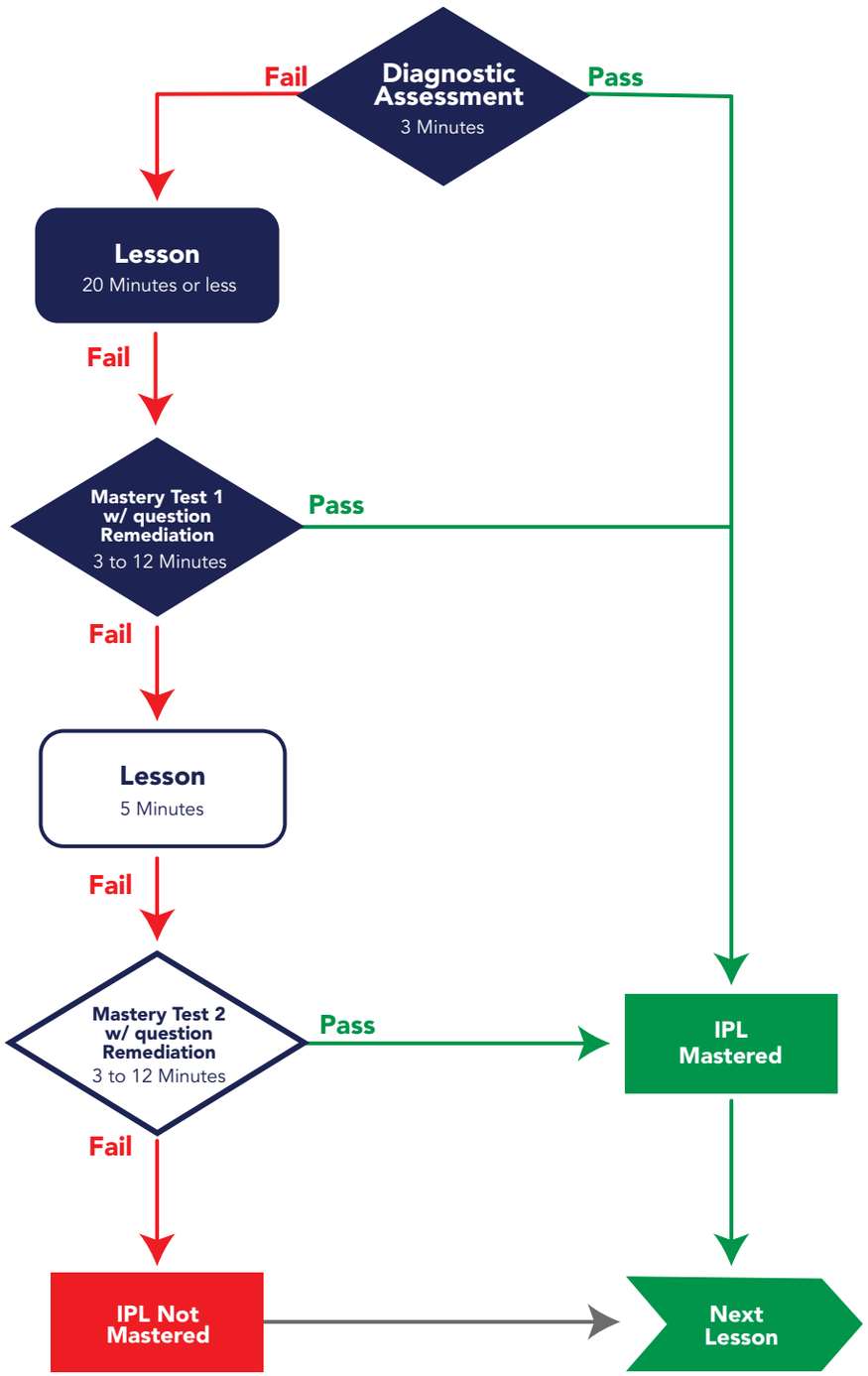
Expedition Titles

Expedition	Standards
Big City Growth	• Distinguish between situations that can be modeled with linear functions and with exponential functions. • Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of the relationship, or two input-output pairs (including reading these from a table). • Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.
Building with Patterns	• Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context. • Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. For example, the Fibonacci sequence is defined recursively by f(0) = f(1) = 1, f(n+1) = f(n) + f(n-1) for n≥1.
Built to Last	• Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.* • Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table). • Interpret the parameters inalinearorexponentialfunctionin terms of a context.
Bungee Plunge!	• Distinguish between situations that can be modeled with linear functions and with exponential functions. • Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals. • Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. • Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.
Classroom Dragsters	• Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. • Define appropriate quantities for the purpose of descriptive modeling. • Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
Coaster Motion	• Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions. • Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables. • Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values,or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.
Electropop Rally	• Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R. • Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method. • Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
Extreme Slopes	• Identify the effect on the graph of replacing f(x) by f(x)+k, kf(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.
Graphic Racing	• Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).
Running Well Thief	• Write a function that describes a relationship between two quantities.

Expedition	Standards
Inventor's Workshop	• Interpret expressions that represent a quantity in terms of its context. • Interpret parts of an expression, such as terms, factors, and coefficients. • Interpret complicated expressions by viewing one or more of their parts as a single entity. *For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P.* • Create equations and inequalities in one variable and use them to solve problems. *Include equations arising from linear and quadratic functions, and simple rational and exponential functions.* • Create equations in two or more variables to represent relationships between quantities. Graph equations on coordinate axes with labels and scales. • Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. *For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.*
Package Delivery	• For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.* • Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.* • Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.
Projectile Isle	• Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b. • Graph linear and quadratic functions and show intercepts, maxima, and minima.
Pully Power	• Understand that a function from one set (called the domain to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of f is the graph of the equation y = f(x) • Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context. • Write a function that describes a relationship between two quantities.* • Determine an explicit expression, a recursive process, or steps for calculation from a context.
Rocket Explorer	• Represent data with plots on the real number line (dot plots, histograms, and box plots). • Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.
Solar Power	• Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.* • Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.
The Art of Coaching	• Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).
Tractor Pull	• Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.*
Tuned in to Exponents	• Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. *For example, we define 51/3 to be the cube root of 5 because we want (51/3)3 = 5(1/3)3 to hold, so (51/3)3 must equal 5.* • Rewrite expressions involving radicals and rational exponents using the properties of exponents.

IPL Series

IPLs are designed using a mastery learning model. Students begin each IPL with a diagnostic assessment to determine each student's level of knowledge. The workflow illustrated below outlines the process students follow to master each concept delivered in the IPLs. The computer-based instruction targets each student to build mastery and gives teachers the opportunity for one-on-one intervention for those students who require additional practice. If a student fails the first mastery test, the student is prevented from continuing the lesson, and our Synergy management system alerts teachers via computer and/or mobile device that intervention is needed. The process enables each student to learn and progress at his or her own pace and provides targeted student-teacher interaction at the moment of need.



Integers

Math Connection - Students play up to 11 games to practice basic skills. The teacher determines which games are needed.

Math Concepts
- Speaking Math
- Integers
- Adding Integers
- Subtracting Integers
- Multiplying and Dividing Integers

Introduction to Decimals

Math Connection - The teacher leads a series of games through a PowerPoint. Students practice recognizing, creating, saying, and rounding decimals using cards. Students compare decimals and order them as if on a number line.

Math Concepts
- Decimal Numbers
- Rounding Decimals
- Ordering Decimals

Decimal Operations

Math Connection - Students play a four-inning baseball game. Inning 1: Addition of decimals. Inning 2: Subtraction of decimals. Inning 3: Multiplication of decimals. Inning 4: Division of decimals

Math Concepts
- Adding Decimals
- Subtracting Decimals
- Multiplying Decimals
- Dividing Decimals

Introduction to Fractions

Math Connection – Students create a unique bingo card. Then, they play bingo by simplifying fractions that are given by the teacher as improper numbers, mixed numbers, or an unsimplified fraction.

Math Concepts
- Graphical Representation of Fractions
- Interpretation of Fractions
- Improper Fractions and Mixed Numbers
- Converting Between Mixed Numbers & Improper Fractions
- Representing Fractions on a Number Line
- Factoring
- Simplifying Fractions

Operations with Fractions I

Math Connection – Students play a game using dice to generate the numbers in the numerator and denominator for the fractions. Students add and subtract fractions with like and unlike denominators. Students also add and subtract improper fractions. Students simplify their answers.

Math Concepts
- Adding Fractions with Like Denominators
- Adding Multiple Fractions with Like Denominators
- Adding Mixed Numbers
- Least Common Multiples
- Adding Fractions with Unlike Denominators
- Subtracting Fractions with Like Denominators
- Subtracting Fractions with Unlike Denominators
- Subtracting Multiple Fractions
- Subtracting Mixed Numbers

Operations with Fractions II

Math Connection – The teacher leads a series of activities through which students practice multiplying and dividing mixed numbers. Students create fractions through the use of fraction and number cubes.

Math Concepts
- Multiplying Fractions
- Multiplying Mixed Numbers
- Dividing Fractions
- Dividing Mixed Numbers
- Converting Decimals/Fractions

Real Number System

Math Connection – Students participate in several activities to work with the real number system. The teacher chooses to do all the activities or has students complete only those that he or she feels the students need to practice most.

Math Concepts
- Real Number System
- Ordering Numbers
- Order of Operations
- Prime Factorization
- Scientific Notation 1
- Scientific Notation 2

Properties of Real Numbers

Math Connection – Students use cards and dice with math symbols to demonstrate examples of the properties of real numbers. The students play a properties matching game.

Math Concepts
- Properties of Equality 1
- Properties of Equality 2
- Substitution
- Commutative Properties
- Associative Properties
- Interpretation of Fractions
- Identity and Inverse Properties
- Distributive Property

Ratios and Percents

Math Connection – Students use a car and roll ramp to obtain data for use with ratios and percentages.

Math Concepts
- Percents
- Percent Change
- Simple Interest
- Compound Interest
- Introduction to Ratios
- Proportions and Unknowns

Equations

Math Connection – Students use a car and roll ramp to obtain data for use with ratios and percentages.

Math Concepts
- Combining Like Terms
- Solving One-Step Equations
- One-Step Equation Word Problems
- Multi-step Equations
- Rate Equations
- Simplifying to Solve Equations
- Variables and Variation

Linear Equations and Graphing

Math Connection – Students build and time LEGO® cars on a ramp to determine speed. Students create linear equations. Students compare and contrast the relationships between the parts of the equations and their meanings in the experiments. They create graphs of the equations using a graph board.

Math Concepts
- The Coordinate Plane
- Distance and Midpoint Formulas
- Slope
- Slope-Intercept Form
- Standard Form
- Point-Slope Form

Inequalities

Math Connection – Students use cards, dice, math symbols, Wikki Stix, and graph boards to solve and graph inequalities and compound inequalities. Students use a number line or a coordinate grid to show solutions.

Math Concepts
- Inequalities
- Solving Inequalities
- Solving Compound Inequalities
- Linear Inequalities 1
- Linear Inequalities 2

Absolute Value

Math Connection – Students shoot straw rockets at a target and keep track of the distance from the target – negative distance in front of the target, positive distance beyond the target. Students create a table and then use absolute value to determine the total distance from the target. Students use their graph boards to plot absolute value equations.

Math Concepts
- Absolute Value
- Solving Absolute Value Equations
- Graphing Absolute Value

Functions

Math Connection –tudents use dice to create domains for given functions including linear, quadratic, absolute value, and step functions. Students graph the functions on a graph board.

Math Concepts
- Functions
- Special Functions
- Graphing Functions

Transformations

Math Connection –Students use a geometry board with pegs and rubber bands, MIRAs, and graph boards to practice transformations.

Math Concepts
- Points, Lines, and Shapes
- Translations
- Reflections
- Rotations
- Dilations

Exponents

Math Connection –Students have the opportunity to play up to 10 games to practice using exponents. The teacher decides which games will be played.

Math Concepts
- Exponents
- Properties of Exponents 1
- Properties of Exponents 2

Radicals

Math Connection – Students use cards, math symbols, and graph boards to practice using and simplifying radicals and radical expressions.

Math Concepts
- Perfect Squares and Square Roots
- Cube Roots
- Simplifying Square Roots
- Radical Expressions
- Radical Expressions – Operations

Special Equations

Math Connection – Students solve rational expressions and equations and simplify complex fractions and mixed expressions using cards, math symbols, and graph boards.

Math Concepts
- Radical Equations
- Complex Fractions
- Rational Equations
- Radical Expressions
- Radical Expressions – Operations

Systems of Equations

Math Connection – Students use cards, dice, math symbols, rulers, and graph boards to solve systems of equations. Students graph some solutions. They use substitution and elimination to solve other systems of equations. Students also solve systems of inequalities.

Math Concepts
- Systems of Equations – Graphs
- Systems of Equations – Substitution
- Systems of Equations – Elimination
- Systems of Inequalities

Matrices

Math Connection – Students build and

use a LEGO® car to measure distance traveled when only the hubs are used and again when rubber tires are added. The two matrices are compared. Students are given the scenario of running a hobby shop that has several types of car kits for sale. They use matrices to keep track of inventory as sales and purchases are made. Then, they determine if they should build their own kit with raw materials or continue to purchase a premade kit. Students add and subtract matrices, multiply matrices by a scalar, and then multiply matrices together in order to run the hobby shop.

Math Concepts
- Matrices – Data Collection
- Matrices – Addition and Subtraction
- Matrices – Multiplication

Polynomials

Math Connection – The teacher leads students through the activity. Students use algebra tiles and graph boards to add, subtract, and multiply polynomials.

Math Concepts
- Monomials
- Polynomials
- Adding & Subtracting Polynomials
- Multiplying Polynomials
- Special Products of Polynomials
- Closure

Quadratics

Math Connection – Students use straw rockets to view the shape of a parabola. Students model the trajectory of a straw rocket using quadratic equations. Students solve quadratic equations to predict where their rocket will land. Students use a graph board to answer questions about quadratic equations.

Math Concepts
- Graphing Quadratics 1
- Graphing Quadratics 2
- Solving Quadratics by Graphing
- Quadratic Formula
- The Discriminant

Factoring

Math Connection – Students practice factoring integers; algebraic expressions; and polynomials using cards, math symbols, and graph boards. Students use the Distributive Property, FOIL, perfect squares, and completing the square methods along with simple prime factorization.

Math Concepts
- Factoring Algebraic Terms
- Factoring with the Distributive Property
- Factoring with FOIL 1
- Factoring with FOIL 2
- Factoring Perfect Square Trinomials
- Completing the Square

Exponential Equations

Math Connection – Students will create a graph using circles to represent exponential growth and decay. They create the range from a given domain for an exponential function. Students then transfer the information to the graph board.

Math Concepts
- Exponential Functions
- Exponential Growth
- Exponential Decay

Probability

Math Connection – Students use cards, dice, and graph boards to determine outcomes for independent and dependent events, combinations, and permutations.

Math Concepts
- Fundamental Counting Principle
- Probability
- Probabilities of Independent & Dependent Events
- Probability of Compound Events
- Permutations
- Combinations

Data Graphs I

Math Connection – Students will complete up to five activities. Some activities include using two LEGO® cars for comparison of distance traveled. Students will create a back-to-back stem-and-leaf plot. They will also use cards and dice to create information for use in averages. Students will use colored circles, algebra tiles, and other manipulatives to create data for bar graphs and box-and-whisker plots.

Math Concepts
- Tree Diagrams, Tables, and Charts
- Bar Graphs and Histograms
- Organizing Data
- Averages
- Box-and-Whisker Plots

Data Graphs II

Math Connection – Students create simple, stratified, and systematic samples using cards and dice. They plot coordinate pairs on a scatter plot and draw a line of best fit on a graph board.

Math Concepts
- Population and Sampling
- Scatter Plots

Logic and Sequences

Math Connection – Students use straw rockets to create data for arithmetic sequences. Information about the components are used to create geometric sequences.

Math Concepts
- Inductive and Deductive Reasoning
- Introduction to Sequences
- Arithmetic Sequences
- Geometric Sequences

Angles

Math Connection – Students will use a protractor to measure angles to determine angle type.

Math Concepts
- Introduction to Geometry
- Parallel, Perpendicular, and Skew Lines
- Angles
- Measuring Angles
- Angle Relationships

Triangles

Math Connection – Students identify, measure, and create a variety of triangles and congruent triangles. They determine ratios in a given triangle including sine, cosine, and tangent. Students use geometry boards, pegs, rubber bands, protractors, rulers, and graph boards during the activity.

Math Concepts
- The Transversal
- Introduction to Triangles
- Congruent Triangles
- Classifying Triangles
- Similar Triangles
- Sine, Cosine, and Tangent
- Trigonometric Ratios
- Inequality, Right Triangles, & the Pythagorean Theorem

Polygons

Math Connection – Students use polygon shapes, paper, rulers, and graph boards to work with polygons. Students compare, measure, and create polygons.

Math Concepts
- Introduction to Polygons
- Missing Angles of Polygons
- Quadrilaterals, Rectangles, and Squares
- The Parallelogram & the Rhombus
- Trapezoids & Kites
- Perimeter
- Area
- Area of Irregular Shapes

Circles

Math Connection – Students calculate the area of circles; use circumference to determine radius; and calculate the volume and surface area of cones, cylinders, and spheres. Students use card stock to create a package and then create a scaled version of the package.

Math Concepts
- Circles
- Circumference and Area
- Cylinders
- Cones
- Spheres

Prisms and Pyramids

Math Connection – Students identify and construct prisms and pyramids using straws and pipe cleaners. Students calculate the area and volume of prisms and pyramids and identify their nets.

Math Concepts
- Cubes
- Rectangular Prisms
- Triangular Prisms
- Rectangular Pyramids
- Triangular Pyramids
- Nets

Units

Math Connection – Students determine and convert standard and metric measurement for length and temperature. Students measure several objects in the room and use graph boards to gather data and solve problems.

Math Concepts
- Standard Units
- Metric Units
- Dimensional Analysis
- Converting Fahrenheit and Celsius

Accuracy

Math Connection – Students use accuracy and precision to measure the distance from their rocket to the target. They use significant digits in addition, subtraction, multiplication, and division.

Math Concepts
- Significant Digits
- Operations with Significant Digits
- Accuracy and Precision
- Factoring with the Distributive Property
- Factoring with FOIL 1
- Factoring with FOIL 2
- Factoring Perfect Square Trinomials
- Completing the Square

Exponential Equations

Math Connection – Students will create a graph using circles to represent exponential growth and decay. They create the range from a given domain for an exponential function. Students then transfer the information to the graph board.

Math Concepts
- Exponential Functions
- Exponential Growth
- Exponential Decay

Special Equations

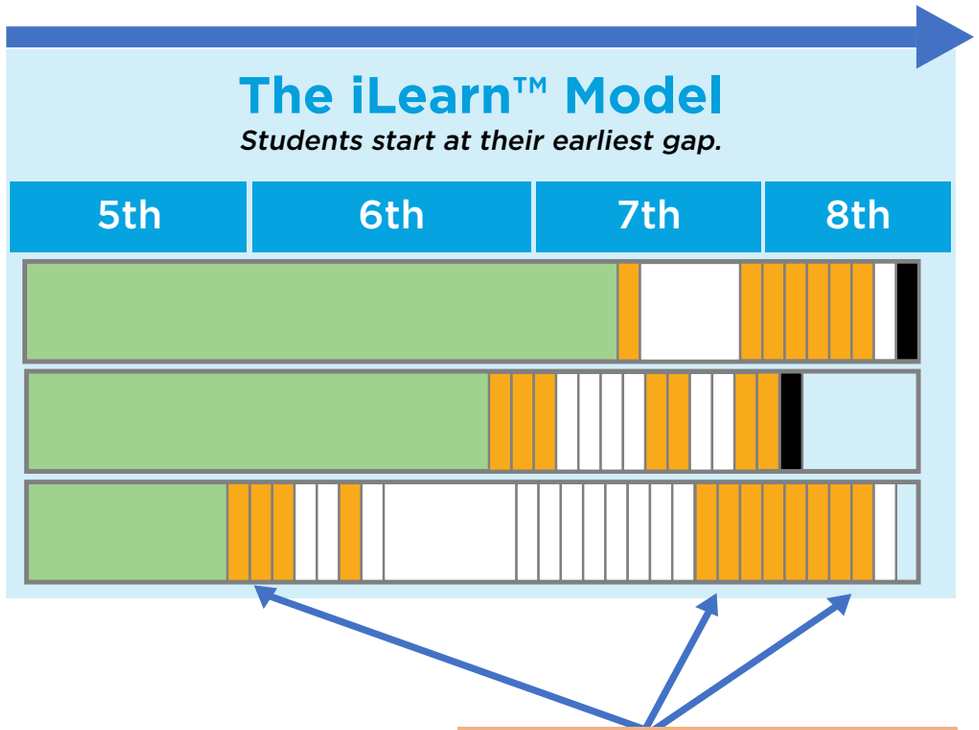
Math Connection – Students solve rational expressions and equations and simplify complex fractions and mixed expressions using cards, math symbols, and graph boards.

Math Concepts
- Radical Equations
- Complex Fractions
- Rational Equations
- Radical Expressions
- Radical Expressions – Operations

iLearn:™ Closing the Gaps

This prescriptive, individualized math program starts each student at their earliest gap, then precisely matches instruction to each student's unique content needs, based on detailed diagnostic assessments. Students skip what they know, and learn just what they need to succeed.

Accelerate students back to grade level



Prescriptive Intervention Defined

The **iLearn Math** solution is "prescriptive" because it precisely matches the content that each student learns to their unique needs, based on detailed diagnostic assessments.

It then uses embedded formative assessments to custom-tailor the delivery process to optimize progress for each student. All of this is done without requiring additional work by the teacher.

Extensive Reporting

Teachers are supported by extensive online reports available on a real-time basis. They range from detailed, actionable information - on each student's learning needs, performance, and progress - to summary reports on class, school-level, and district results and progress.

The result is that every student receives exactly what is needed to optimize their achievement growth – every minute of every day. This is done with unprecedented precision and fidelity, while making it even easier to manage the RTI process.

Assignments

Teachers assign targeted Lessons or Chapters that are like mini-math programs, allowing students to master just the parts of each Assignment they need.

Assessments

"Benchmark" testing at grade-level and "Multi-Grade Diagnostic" testing that surveys critical concepts across prior grades offer multiple ways for teachers to learn what students know and do not know.

star ACADEMY

Blended Science

Progression of Learning

Core knowledge and the scientific method

NOLA Education science curriculum employs a unique program scope and sequence designed to introduce students to the foundational concepts of inquiry-based learning and the scientific process. Students navigate through a progression of instruction where they inquire, hypothesize, research, experiment, analyze data, and draw conclusions. This process is designed around activities that are aligned with core content for Earth, physical, and life science.

Each core course is experienced over an evolution of five stages. In the first stage, students focus on understanding the scientific method before moving on to the remaining stages where they learn to apply the scientific method. Students develop, revise, and test hypotheses and are given more control of the learning process in each succeeding stage. The final stage gives students full ownership of the learning process, culminating with an open-ended scientific investigation.

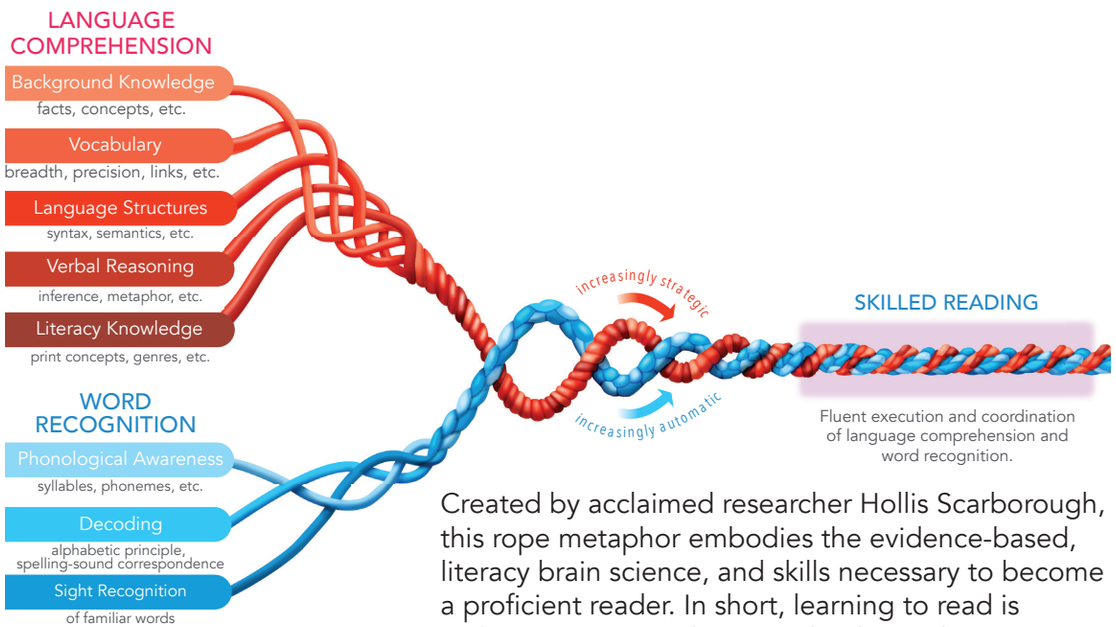
Using this approach not only engages students in core science concepts in a real-world learning environment but also teaches them the 21st-century skills of critical thinking, problem solving, teamwork, and communication, all of which are learned by applying the scientific method.

Physical Science

Earth Science

Life Science

Language Live (ELA)



Scarborough, 2001

Created by acclaimed researcher Hollis Scarborough, this rope metaphor embodies the evidence-based, literacy brain science, and skills necessary to become a proficient reader. In short, learning to read is rocket science. Teachers need to know the content, methodology, and explicit, Structured Literacy approach to successfully teach students to read.

Star Academy's English Language Arts (ELA) program is based on ***"LANGUAGE! Live®"*** from Voyager Sopris. ***LANGUAGE! Live®*** is a comprehensive literacy intervention course for struggling students in grades 5 –12. With a blended approach, LANGUAGE! Live's instruction reinforces the literacy foundations students need while strategically using authentic text to engage and accelerate them to grade-level proficiency.

LANGUAGE! Live is best suited for the adolescent learner who:

- Has some success with foundational skills but also is discouraged, or lacks motivation
- Performs well on oral-comprehension measures when reading is not required
- Has difficulty reading vocabulary words by sight
- Struggles with decoding longer words and has poor spelling
- Is an English language learner or has special needs, including those with dyslexia

Word Training

Word Training leverages the power of technology to provide precise and consistent instruction, flexible pacing, ample practice, and the ability for learners to privately and independently acquire skills they missed earlier in their school careers. Word Training engages students with foundational-skills instruction while providing motivating videos that build background knowledge.

Based on a four-part lesson design:

1. Tutorial video led by an expert teacher
2. Check your understanding activity
3. Video reviewing concept led by peer tutors
4. Cumulative practice

Fluency Checks with recording features measure students' fluency progress

- End-of-unit assessments measure words, phrases, sentences, and connected text read correctly
- Students track online performance

Text Training

Text Training leverages the power of the teacher to guide students in close reading of challenging, age-appropriate text and provides resources to reinforce and extend student learning. Teachers can focus on details essential to comprehension, critical thinking, and the connection between reading and writing. Text Training also provides additional practice with these critical skills and creates opportunities for teachers and students to interact, and make meaning.

Text training is based on a four-part unit design:

- Vocabulary
- Grammar
- Reading Comprehension
- Writing

The lessons spiral in difficulty as instruction in the unit advances with multiple opportunities for practice. The content in all four strands is interwoven into coherent, systematic instruction.

- Formative assessments in each unit allow teachers to see a student's response to instruction
- Vocabulary checkpoints check students' acquisition of new word knowledge
- Reteach lessons located in the online resources provide additional instruction
- Practice activities align with instruction and provide feedback so students can continue to learn. These include:
  - Power Pass, an opportunity to apply knowledge to questions that are similar to those asked on high-stakes tests
  - Content Mastery Practice, which allows students to check their own learning

Progress Monitoring

Each component of ***LANGUAGE! Live®*** provides resources and tools to track student performance and provide opportunities to help students continue to learn.

Benchmark Assessments

- Are administered, completed, and scored online
- Determine placement as well as student growth throughout the year
- Occur three times per year
- Measure progress in comprehension, fluency, and spelling
- Utilize norm-referenced assessments

Baseline/Summative Assessments

- The Initial/Final Assessment is a summative assessment based on the curriculum presented to students throughout a LANGUAGE! Live level.
- The Initial Assessment can be used to refine placement and refine instruction time and focus.
- The Final Assessment can be used

Quests

Quests are computer-delivered content that bring a hands-on component to English Language Arts. Students work in cooperative learning pairs and occasionally in small groups for discussions or presentations. Students experience the curriculum via a multimedia delivery system designed to engage multiple learning types through hands-on manipulative and reference texts.

Developing My Future Story

- Read with a purpose.
- Refine a topic.
- Develop a thesis statement.
- Take the O*NET Career Interests Inventory.
- Learn about sources.
- Develop research questions.
- Create a list of resources to use for a career investigation.
- Investigate a location to visit or live and work.
- Learn how to use resources.
- Integrate sources into your own writing.
- Create a preliminary list of works cited.
- Learn about presentations.
- Create a PowerPoint presentation that shows researched information.

Past Tense & Current Events

- Define and identify informational texts.
- Identify the location and uses of common elements found in informational texts.
- Analyze text treatments and how they can change or clarify the meaning of a word or passage. Identify audience.
- Recognize and explain author bias.
- Write an editorial column for a newspaper.
- Learn to make inferences.
- Practice drawing conclusions.
- Learn about purpose and tone of a piece of text.
- Discriminate between informative & persuasive text.
- Determine the appropriate tone of a text.
- Learn to identify & compose a thesis statement.
- Compare and contrast thesis statements.
- Write articles for a newspaper.
- Learn the purpose of different types of graphs.
- Use information from tables to create graphs.
- Analyze information from different types of graphs.
- Develop graphs for a newspaper to convey information in illustrated form.
- Learn to read charts and maps.
- Make inferences or draw conclusions based on graphical information.
- Identify significant information in graphic captions.
- Create a chart or map to represent relevant information for a newspaper.
- Write supplemental material for the final newspaper project.
- Investigate types of propaganda.
- Evaluate the purpose of propaganda.
- Identify propaganda in written & graphical form.
- 26 I Star Academy Course Descriptions
- Examine political cartoons & practice analyzing them.
- Create propaganda for the final newspaper project.
- Learn to glean information from photographs.
- Read picture captions critically.
- Analyze information from nonprinted text.

Reading Between the Lines

- Read The Giver.
- Use active reading strategies to analyze setting and character.
- Learn strategies for understanding new vocabulary.
- Learn types of figurative language.
- Write a song using figurative language.
- Learn types of point of view. Write a passage from another character's point of view.
- Explore instances of symbolism.
- Write a sensory paragraph.
- Use a plot diagram to explore the elements of plot.
- Learn about theme and utopias.
- Create a utopia travel poster.
- Learn about audience.
- Write a letter to the author.
- Locate elements of foreshadowing in the book.
- Make predictions about what will happen in the remainder of the novel.
- Explore tone and style.
- Create an illustration that highlights your understanding of literary terms.
- Create your own chapter of the novel titled "24: The Final Chapter."

Writing Dynamics

- Learn the importance of identifying audience.
- Evaluate an advertisement.
- Write an essay titled "Audience Analysis."
- Learn the importance of prewriting.
- Read pieces of argumentative passages.
- Create a list, a graphic organizer, and an outline.
- Learn about drafting.
- Create a draft of an essay titled "Argument."
- Learn about persuasion used in advertising.
- Identify points of writing style.
- Write a marketing advertisement.
- Identify tone in your writing.
- Read claim letters.
- Create a claim letter.
- Discover the importance of editing.
- Write clear directions for others to follow.
- Learn about the importance of word choice.
- Write a letter of request.
- Explore creative writing.
- Explore the final process of writing-publishing.

Middle School
Social Studies

Inspire students to think critically, challenge assumptions, and understand the complexities of societal structures.

History Alive! The Ancient World

History Alive! The Ancient World introduces students to the beginning of the human story. As students explore the great early civilizations of Egypt and the Near East, India, China, Greece, and Rome, they discover the secrets of these ancient cultures that continue to influence the modern world.

- **Foundations of History**
- **The Rise of Civilization**
- **Ancient Egypt and the Middle East**
- **Ancient India**
- **Ancient China**
- **Ancient Greece**
- **Ancient Rome**

History Alive! The World Through 1750

Take a trip to ancient Greece through video-based geography challenges, analyze primary source diary entries from Lady Murasaki, and explore sites of encounter like Quanzhou and Tenochtitlán. TCI's *History Alive! The World Through 1750* engages students with meaningful, immersive lessons that build critical thinking skills and foster a deep understanding of the world.

- **Foundations of History**
- **The Rise of Civilization**
- **Ancient Egypt and Kush**
- **Ancient India**
- **Ancient China**
- **Ancient Greece**
- **Ancient Rome**
- **Europe During Medieval Times**
- **The Middle East During Medieval Times**
- **The Culture and Kingdoms of West Africa**
- **Imperial China**
- **Pre-Feudal Japan**
- **Civilizations of the Americas**
- **The Medieval World, 1200-1490**
- **Europe's Renaissance and Reformation**
- **Europe Enters the Modern Age**

History Alive! The United States Through Industrialism

History Alive! The United States Through Industrialism immerses students in a powerful journey through the history of the United States from its earliest foundations to the Age of Industrialism.

- **Foundations of History**
- **America Before and After Colonization**
- **Revolution in the Colonies**
- **Forming a Nation**
- **Launching the New Republic**
- **An Expanding Nation**
- **Americans in the Mid -1800s**
- **The Union Challenged**
- **Migration And Industry**
- **A Modern Nation Emerges**

History Alive! The United States Through Modern Times

History Alive! The United States Through Modern Times captures the story of the United States from the precolonial era to the 21st century. Our new edition, now available, goes deeper into modern U.S. history while maintaining the same level of hands-on engagement established in the previous edition.

- **Forming a New Nation**
- **Launching the New Republic**
- **An Expanding Nation**
- **Americans in the Mid-1800s**
- **The Union Challenged**
- **Migration And Industry**
- **World War II and The Cold War**
- **Moving Toward Today**

Geography Alive! Regions and People

Created in partnership with scholars from the National Council for Geographic Education (NCGE), ***Geography Alive! Regions and People*** adopts a stimulating case-study approach to geography.

- **The Geographer's World**
- **Canada and the United States**
- **Latin America**
- **Europe and Russia**
- **Africa**
- **Southwest and Central Asia**
- **Monsoon Asia**
- **Oceania and Antarctica**

High School
Social Studies

TCI's high school social studies curriculum program aims at giving students a strong foundation for excelling in college, career, and civic life.

History Alive! World Connections

History Alive! World Connections takes a global approach to the study of world history by exploring inter-regional connections and global themes that connect our world today. Just as a filmmaker uses multiple lenses to tell a story, this program invites students to begin with a wide-angle view to examine eras in world history and then "zoom in" to understand the development of events and interactions among the world's people and cultures today.

- **Foundations of History**
- **The World Before 1750**
- **The First Global Age**
- **The Age of Revolutions**
- **A World in Crisis**
- **The Cold War**
- **The Contemporary World**

Geography Alive! Regions and People

Created in partnership with scholars from the National Council for Geographic Education (NCGE), ***Geography Alive! Regions and People*** adopts a stimulation case-study approach to geography.

- **The Geographer's World**
- **Canada and the United States**
- **Latin America**
- **Europe and Russia**
- **Europe and Russia cont.**
- **Africa**
- **Southwest and Central Asia**
- **Monsoon Asia**
- **Oceania and Antarctica**

History Alive! Pursuing American Ideals

History Alive! Pursuing American Ideals teaches students about U.S. history through the use of the founding ideals — established in the Declaration of Independence. Students discuss and debate U.S. history in a way that goes beyond a chronological timeline of events. By the end of the program, they will have made deeper connections between the past and the present.

- **Establishing an American Republic 1492 - 1896**
- **Industrialism and Reform 1840 - 1920**
- **Expanding American Global Influence 1796 - 1921**
- **The Roaring Twenties and the Great Depression**
- **World War II and the Cold War 1917 - 1960**
- **The Search for a Better Life 1945 - 1990**
- **Tumultuous Times 1954 - 1980**
- **The Making of Modern America 1980 - Present**

Government Alive! Power, Politics, and You

Government Alive! Power, Politics, and You actively connects the government to the everyday lives of high school students. With hands-on lessons and a concise, standards-based text, students become enthusiastically engaged in learning about the U.S. government at the local, state, and federal levels. Government Alive! Power, Politic, and You inspires and prepares students to become active citizens.

- **Power, Authority, and Government**
- **Foundations of American Government**
- **Political Participation and Behavior**
- **The Legislative Branch**
- **The Executive Branch**
- **The Judicial Branch**

Econ Alive! The Power to Choose

Econ Alive! The Power to Choose demystifies economics for students. A concise, standards-based text and multiple intelligence activities help students grasp complex concepts in the context of understandable real-world situations. This program promotes an economic way of thinking about what's going on in the world and why. *Econ Alive! The Power to Choose* also builds personal financial literacy to prepare high school students to participate in the economies of today and tomorrow.

- **The Economic Fundamentals**
- **How Markets Work**
- **Economic Institutions and Organizations**
- **Economics of the Public Sector**
- **Measuring and Managing the Economy**
- **Globalization and the Global Economy**

A Twenty-First Century Approach to

WORKFORCE DEVELOPMENT & CAREER EXPLORATION

Alternative Energy
Chemical Engineers
Civil Engineers
Electrical or Electronic Engineers
Environmental Engineers
HazMat Removal Workers
Industrial Safety Engineers
Nuclear Engineers
Petroleum Engineers
Service Station Attendants

Animals
Animal Caretakers (Kennel Attendants, Groomers)
Animal Trainers
Biological Scientists (Zoologists)
Farmers or Ranchers
Forest or Conservation Workers
Pest Control Workers
Veterinarians
Veterinary Assistants
Zookeepers

Applied Physics
Aerospace Engineers
Broadcast Technicians
College or University Faculty
Communication Equipment Installers or Repairers
Database Administrators
Mechanical Engineers
Opticians
Stationary Engineers

Aquaculture
Agricultural Engineers
Agricultural Technicians
Biologists
Conservation Workers
Farmers or Ranchers
Fish or Game Wardens
Food Scientists
Seamen
Water Treatment Plant Operators

Astronomy
Aerospace Engineers
Air Traffic Controllers
Astronomers
College or University Faculty
Computer Hardware Engineers
Computer Operators
Computer Science Teachers
Photographers
Physicists
Reporters or Correspondents

Biotechnology
Agricultural Engineers
Agricultural Technicians
Food Science Technicians
Biologists
Skin Care Specialists
Sports Competitors

Body Systems
Athletes
Cardiovascular Technicians
Dentists
Emergency Medical Technicians
Family or General Practitioners
Medical Transcriptionists
Optometrists
Paramedics
Registered Nurses
Rehabilitation Counselors
Skin Care Specialists
Sports Competitors

Carbon Footprint
Agricultural Engineers
Biologists
Chemists
Epidemiologists
Family or General Practitioner
Medical or Clinical Laboratory Technologists
Phlebotomists
Veterinarians

Changing Oceans
Chemical Oceanographers
Fishers or Fishing Vessel Operators
Marine Biologists
Physical Oceanographers

Chemical Math
Analytical Chemists
Applied Mathematicians
Chemical Engineers
Chemical Technicians
Materials Chemists
Materials Engineers
Medicinal Chemists
Nuclear Engineers
Petroleum Engineers
Physical or Theoretical Chemists

Climate & Biomes
Agricultural Engineers
Atmospheric Scientists
Biological Scientists (Ecologists)
Computer Programmers
Conservation Officers
Environmental Engineers
Forest or Conservation Workers
Geoscientists (Oceanographers)

Climate Change
Atmospheric Scientists
Meteorologists
Climatologists

Computer Scientists
Environmental Science Technicians
Mathematicians
Operational Meteorologists
Weather Forecasters
Physical Meteorologists

Composites
Aerospace Engineers
Aircraft Mechanics or Technicians
Automotive Body or Glass Repairers
Dentists
Industrial Designers
Industrial Engineering Technicians
Materials Engineers

Dynamic Earth
Agricultural Engineers
Agricultural Technicians
Biologists
College or University Faculty
Conservation Officers
Environmental Engineers
Farmers or Ranchers
Forest Workers
Landscape Architects

Eco-Architecture
Architects
Construction Managers
Energy Auditors
Engineers

Ecology
Agricultural Engineers
Biological Scientists (Ecologists)
Conservation Officers
Environmental Engineers
Forest or Conservation Workers
Landscape Architects
Marine Biologists
Surveyors
Urban or Regional Planners

Electricity
Electrical Engineering Technicians
Electrical Engineers
Electrical Equipment Assemblers
Electrical Power-Line Installers
Electricians
Insulation Workers
Security Systems Installers
Telecommunications Line Installers
Welders

Energy, Power & Mechanics
Electrical Power-Line Installers
Electricians
Farm Equipment Mechanics
Heating, Air Conditioning
Refrigeration Mechanics
Mechanical Engineers
Nuclear Engineers
Petroleum Engineers

Engineering Bridges
Agricultural Engineers
Biologists
Civil Engineers
Conservation Officers
Environmental Engineers
Farmers or Ranchers
Forest or Conservation Workers
HazMat Removal Workers
Material Moving Occupations
Recyclable Material Collectors
Nuclear Engineers

Fitness & Health
Fitness Trainers
Personal Care Aides
Physical Therapists
Physical Therapists
Recreation Workers
Registered Nurses
Rehabilitation Counselors
Respiratory Therapists
Shampooers
Speech Pathologists

Food Science
Agricultural Engineers
Agricultural or Food Science Technicians
Biologists
Skin Care Specialists
Sports Competitors

Forces
Aerospace Engineers
Air Traffic Controllers
Aircraft Engine Specialists
Boat Builders or Shipwrights
Civil Engineers
Construction Inspectors
Highway Maintenance Workers
Mechanical Engineers

Forensic Science
Chemical Engineers
Claim Examiners
Criminal Investigators
Emergency Medical Technicians
Epidemiologists
Fire Inspectors
General Practitioners
Insurance Investigators
Science Technicians

Future Fuels
Electrical Engineers
Geologists
Hydrologists
Meter Readers

Garbology
HazMat Removal Workers
Hydrologists
Inspectors, Testers, Sorters, Refuse and Recyclable Materials

Genetics
Biologists
Conservation Officers
Dietitians or Nutritionists
Epidemiologists
Family Practitioners
Farmers or Ranchers
Nursery or Greenhouse Managers
Registered Nurses

Going Green
Environmental Engineers
Farmers
HVAC Technicians
Woodworkers

Gravity
Aerospace Engineers
Air Traffic Controllers
Aircraft Engine Specialists
Avionics Technicians
Civil Engineers
College or University Faculty
Mechanical Engineers
Network Administrators

Green Machines
Cargo or Freight Agents
Geoscientists
Landscape Architects

Heart Fitness
Athletes
Dietitians or Nutritionists
Family or General Practitioners
Fitness Trainers
Home Health Aides
Licensed Practical Nurses
Physical Therapists
Physician Assistants
Respiratory Therapists

Heat & Energy
Chemical Engineers
Chemists
Fire Fighters
Food Scientists or Technologists
Industrial Safety or Health Engineers
Nuclear Engineers
Petroleum Engineers

Horticulture
Agricultural Engineers
Biological Scientists (Botanists)
Biological Scientists (Ecologists)
Floral Designers
Forest or Conservation Workers
Landscape Architects
Landscape Workers
Logging Equipment Operators
Nursery Greenhouse Managers
Pesticide Handlers

Immunology
Biologists
Child Care Workers
Dietitians and Nutritionists
Family and General Practitioners
Home Health Aides
Medical and Clinical Lab Technicians
Medical Assistants
Medical Scientists (Epidemiologists)
Registered Nurses

Light & Lasers
Avionics Technicians
Dispensing Opticians
Etchers or Engravers
Ophthalmic Laboratory Technicians
Optometrists
Photographers
Precision Devices Inspectors
Radiologic Technicians
Security or Fire Alarm Systems Installers
Telecomm Installers or Repairers

Material Science
Assemblers or Fabricators
Brick Masons
Carpenters
Ceiling Tile Installers
Cement Masons
Chemical Engineers
Construction Laborers
Petroleum Engineers

Microbiology
Biological Scientists (Microbiologists)
Chemists
Farmers or Ranchers
Food Scientists or Technologists
Medical Assistants
Med or Laboratory Technologists
Pharmacists
Phlebotomists
Registered Nurses

Natural Disasters
Civil Engineers
Construction or Build Inspectors
Emergency Mngmnt Specialists
EMTs or Paramedics
Environmental Engineers
Epidemiologists
Fire Fighters
HazMat Removal Workers
Police Detectives
Dispatchers
Public Safety Personnel
Security Personnel

Oceanography
Environmentalists
Fishers or Fishing Boat Captains
Geoscientists (Marine Biologists)
Geoscientists (Oceanographers)
Marine Engineers or Architects
Material Moving Occupations
Longshoremen
Ship Officers or Sailors

Organism Reproduction
Agricultural Technicians
Biologists
Clinical Laboratory Technologists
Conservation Officers
Epidemiologists
Farmers or Ranchers
Nursery Greenhouse Managers
Veterinarians

Plants & Pollination
Agricultural Engineers
Biologists Clinical Lab Technologist
Floral Designers
Forest Fire Inspectors
Fire Prevention Workers
Conservation Workers
Landscape Architects
Landscape Workers
Logging Equipment Operators
Nursery Greenhouse Managers

Plastics & Polymers
Assemblers or Fabricators
Brick Masons
Chemical Engineers
Chemical Plant Operators
Chemists
Hazardous Materials Removal Workers
Industrial Safety Engineers
Manufacturing Bakers

Reactions
Agricultural or Food Science Techs
Biologists
Chemical Engineers
Chemists
Environmental Engineers
Fire Inspectors
Hazardous Materials Removal Workers
Industrial Safety or Health Engineers
Nuclear Engineers

Rocket Science
Aerospace Engineers
Aircraft Engine Specialists
Avionics Technicians
Computer Programmers
Electrical Engineering Technicians
Electrical Engineers
Mechanical Drafters
Mechanical Engineers

Rocks & Resources
Ecologists
Environmental Engineering Technicians
Environmental Engineers
Hydrologists

Simple Machines
Amusement or Recreation Attendants
Automotive Body Repairers
Bicycle Repairers
Boat Builders
Farm Equipment Mechanics
Maintenance Workers
Sewing Machine Operators
Small Engine Mechanics

Soils
Agricultural Engineers
Agricultural Equipment Operators
Agricultural Technicians
Biologists
Environmental Engineers
Farmers or Ranchers
Food Scientists
Heavy Equipment Operators
Nursery Workers
Surveyors

Sustainable Agriculture
Farmers or Ranchers
Food Scientists
Landscape Architects
Soil Conservationists
Geoscientists
Landscape Architects

The Universe
Aerospace Engineers
Aircraft Mechanics
Aircraft Pilots
Astronautical Engineers
Astronomers
Computer Scientists
Flight Engineers
Mathematicians
Physicists

Water Management
Biologists
Chemical Plant Operators
Conservation Officers
Environmental Engineers
Hazardous Material Workers
Longshoremen
Plumbers
Public Safety Personnel
Safety or Health Engineers

Weather
Air Traffic Controllers
Atmospheric Scientists (Climatologists)
Atmospheric Scientists (Meteorologists)
Dispatchers
Environmental Engineers
Environmental Scientists or Hydrologists
Farmers or Ranchers
Public Safety Personnel
Weather Forecasters

Weights & Measures
Agricultural Engineers
Biologists
Chemical Engineers
Chemists
College or University Faculty
Epidemiologists
Food Scientists or Technologists
Med Records or Health Info Techs