

Sci-Tech Connections

Scope and Sequence

Grade 5

Sci Tech Connections Scope and Sequence - Grade 5

Name of Module	Lesson	Name of Activity	Main Concepts	Specific Expectations	Materials Required	Pacing *
<i>Busy Bodies</i>	1	What's in a Shape	Explores whether athletes perform best within a sport if they have a certain shape.	<ul style="list-style-type: none"> • work in pairs or groups cooperatively • plan investigations for some of your questions and solutions • make a prediction about your investigation and provide your reasons for the prediction • compile and record data gathered through investigation in a journal in order to record and present results • communicate procedures and results to an audience 	<ul style="list-style-type: none"> • camera • tape recorders • sporting magazines • paper • pencil • internet access • sheets of paper 	2 – 40 min. periods + homework
<i>Busy Bodies</i>	2	The Inside Story	Investigates what the inner spaces of the human body reveal about basic units of life.	<ul style="list-style-type: none"> • discuss in groups what you already know about the inside story of your body • create a list of interview questions to find out more information about the inside story • interview people and use other resources to find answers to questions • prepare and view a cell slide • create a newspaper report on the inside story • share report with others 	<ul style="list-style-type: none"> • slides (microscopic) • resource books • Internet access • materials for presentation 	2 or 3 – 40 min. periods + homework
<i>Busy Bodies</i>	3a	On the Move	One of three investigations that explore how muscles, bones, and the nervous system work to facilitate the vast number of movements required by an athlete.	<ul style="list-style-type: none"> • work as a group, respect each other and each other's opinions, and work safely • design and create a model of a bone and muscle working together to cause movement • sketch and label design • describe, using models and simulations, ways in which the skeletal, muscular, and nervous systems work together to produce movement 	<ul style="list-style-type: none"> • cardboard • toilet tissue or paper towel tubes • brass paper fasteners • elastic bands • scissors • straws • tape or glue • string • other materials as needed • access to print or internet resources regarding the skeletal and muscular systems 	2 – 40 min. periods

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<i>Busy Bodies</i>	3b	Carrying the Load	One of three investigations that explore how muscles, bones, and the nervous system work to facilitate the vast number of movements required by an athlete.	<ul style="list-style-type: none"> • work as a group, respect each other and each other's opinions, and work safely • explore the construction of bones by creating a model and test out its strength • simulate the forces that act upon bones • compare how hollow and reinforced structures react to compression • present learning in a graph and share with others 	<ul style="list-style-type: none"> • paper tubes • straws • scissors • glue • masses or objects to act as loads • picture of internal structure of a bone 	1 – 60 min. period
<i>Busy Bodies</i>	3c	Quick Time	One of three investigations that explore how muscles, bones, and the nervous system work to facilitate the vast number of movements required by an athlete.	<ul style="list-style-type: none"> • plan and design an investigation to test reaction time • compile data gathered through investigation • communicate results through charts or graphs • make the connection between reaction time and the nervous system 	<ul style="list-style-type: none"> • ruler • objects to test reaction • timer • print or internet resources on the nervous system 	1 or 2 – 40 min. periods + homework
<i>Busy Bodies</i>	4	Paddle Here and There	Investigates a person's reaction time and the forces associated with paddleball.	<ul style="list-style-type: none"> • work as a group, respect each other and each other's opinions, and work safely • design, plan, and test an investigation with a paddleball • identify and describe the forces that cause a paddleball to work • identify and describe the energy transformations involved in working a paddleball • investigate whether reaction time improves with practice • compile data gathered through investigation • communicate results in a poster 	<ul style="list-style-type: none"> • paddleball or similar structure for every pair or group 	1 – 40 min. period

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<i>Busy Bodies</i>	5a	Take a Breather	One of two activities that explore the circulatory and respiratory systems in the context of athletics.	<ul style="list-style-type: none"> • work as a group, respect each other and each other’s opinions, and work safely • design and carry out an investigation to discover lung capacity • measure and record results • compare lung capacities and recognize the function of lungs • recognize the organs of the respiratory system • explain the connection between lung capacity and endurance 	<ul style="list-style-type: none"> • container of water • straws and/or plastic tubing • clear or translucent containers such as 4 qt (4 L) jars • plastic bags • balloons • measuring devices – clearly marked in ounces (milliliters) • resource books • diagrams of the respiratory system 	1 or 2 – 40 min. periods
<i>Busy Bodies</i>	5b	Get to the Heart of It	One of two activities that explore the circulatory and respiratory systems in the context of athletics.	<ul style="list-style-type: none"> • work as a group, respect each other and each other’s opinions, and work safely • design an apparatus to detect heart rate • build a model to detect heart rate • record heart rate under different conditions • check heart rate via pulse at different parts of body • build a model of a heart • present findings to the class 	<ul style="list-style-type: none"> • tubing • paper • watch with second hand • assortment of cylinders or funnels or plastic soda or water bottles • diagrams of the heart and circulatory system • animal hearts (e.g., chicken) – optional 	1 or 2 – 40 min. periods
<i>Busy Bodies</i>	6	Cool Athletes	Investigates the importance of the largest organ — the skin — in allowing athletes to compete without fainting due to heat exhaustion	<ul style="list-style-type: none"> • work as a group, respect each other and each other’s opinions, and work safely • create a plan to gather information • research to find out the function of our skin • create a product to communicate information about the skin • discuss environmental risks to the skin 	<ul style="list-style-type: none"> • paper • pencil • magnifying glass • pieces of material • eyedroppers • thermometers • print resources on organs of the body, e.g., skin, muscles, excretory system • Internet access 	2 or 3 – 40 min. periods

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<i>Busy Bodies</i>	7	Water, Water Everywhere	Explores the importance of water to our bodies while comparing our excretory system to a water purification system.	<ul style="list-style-type: none"> • work as a group, respect each other and each other’s opinions, and work safely • create a plan to make a model of a filtering system • compare your filtering system with how a kidney actually functions • record findings and share ideas with the class 	<ul style="list-style-type: none"> • filters (coffee, paper towel, cotton wool, screening, etc.) • water • food coloring (red for blood) • sand • jars or clear plastic containers • resource books • internet access (optional) 	2 or 3 – 40 min. periods
<i>Busy Bodies</i>	8	Techie Designers	The culminating project invites the student to design a technological device, product, or program to assist athletes in their sport by supporting the body systems.	<ul style="list-style-type: none"> • work as a group, respect each other and each other’s opinions, and work safely • identify a concern or need of athletes with respect to a product, device, or program • conduct research related to this sports need • design and construct a model of a device, product, or program that might address this concern • communicate results using an oral or computer presentation and working model of the product, device, or program 	<ul style="list-style-type: none"> • tape • cardboard • stir sticks • spools • string • cloth – odds and ends • elastic bands • paper clips • other materials as required 	2 – 40 min. periods + homework
<i>It’s a Matter of Change and Energy</i>	9	Go for Energy	The students are introduced to the term “energy” and explore whether athletes follow a regular diet or rely upon special synthetic food supplements to supply energy.	<ul style="list-style-type: none"> • work as a group, respect other people, work safely, and keep a clean work space • plan investigation to find out about energy from foods • compile data gathered through investigations in order to record and present results • communicate procedures and results for specific purposes, and to specific audiences, using media works, oral presentations, written notes, descriptions, drawings, and charts 	<ul style="list-style-type: none"> • cameras • tape recorders • sporting magazines • paper • pencil • Internet access 	2 – 40 min. periods + homework

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<i>It's a Matter of Change and Energy</i>	10	State the Matter, Please	Investigates the three states — solids, liquids, and gases, through the medium of water.	<ul style="list-style-type: none"> • work as a group, respect other people, work safely, and keep a clean work space • investigate that matter occupies space and has mass • discover the three states of matter: solid, liquid, and gas • compare the similarities and differences among the three states of matter • set up your own investigations • communicate the results of your investigations 	<ul style="list-style-type: none"> • water • ice cubes • access to hot water • tinfoil plates • plastic food wrap • containers of different shapes and sizes 	2 or 3 – 40 min. periods
<i>It's a Matter of Change and Energy</i>	11a	Behind the Scenes	One of two activities that explore physical and chemical changes through foods.	<ul style="list-style-type: none"> • work as a group, respect other people, work safely, and keep a clean work space • identify and describe some changes to materials that are reversible and some that are not • describe examples of interactions between materials that result in the production of a gas • recognize that melting and evaporation require heat • use a thermometer to measure the temperature of a material • investigate and describe changes in the relative volume and shape of materials when pressure is applied to them 	<ul style="list-style-type: none"> • stations • Behind the Scenes Stations recording sheet (page 26) • recipe books 	1 – 40 min. period 1 – 60 min. period
<i>It's a Matter of Change and Energy</i>	11b	Take Away the Heat	One of two activities that explore physical and chemical changes through foods.	<ul style="list-style-type: none"> • work as a group, respect other people, work safely, and keep a clean work space • recognize that heat energy can be lessened via use of materials • identify applications of investigation to use in everyday life • measure temperature in metric units • record data such as time via charts or graphs 	<ul style="list-style-type: none"> • tall narrow jar • crushed ice • small bowl • water • thermometer • insulation materials (paper towels, newspaper, or cotton towels) • paper 	1 – 40 min. period + 5 – 10 min. periods

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<i>It's a Matter of Change and Energy</i>	12	Some Like It Hot ...	Designs and creates a technological device to minimize heat loss.	<ul style="list-style-type: none"> • work as a group, respect other people, work safely, and keep a clean work space • explore a variety of technological devices (Thermos bottles, insulated bags, etc.) that minimize heat loss • design and create a technical device that minimizes heat loss • identify and make modifications to your device • relate applications of the Thermos type device to the everyday world • estimate, measure, and record data • compile data using tally charts, tables, and labeled graphs • present model to others and explain how your device works 	<ul style="list-style-type: none"> • samples of insulated containers • different types of cardboard: corrugated, boxboard, etc. • materials such as cotton, vinyl, and wool • tape • stapler • plastic sheets, bags, or bubble wrap • recycled papers – tissue, etc. • Styrofoam pieces and trays • newspaper • assortment of disposable cups, margarine containers, tin cans, and bottles with lids • thermometers 	2 – 40 min. periods
<i>It's a Matter of Change and Energy</i>	13a	Energy for Life	One of two activities explore concepts of energy within the context of human and bodily functions.	<ul style="list-style-type: none"> • work as a group, respect other people, work safely, and keep a clean work space • discuss the meaning of “energy” • recognize that energy for living things comes from the Sun in the form of heat and light • recognize that solar energy and plants are renewable sources of energy • use the words energy, renewable, and non-renewable • understand that solar energy transforms to chemical energy in food (food energy) 	<ul style="list-style-type: none"> • Energy for Life station sheets (pages 40 and 41) 	1 – 40 min. period + 5 – 10 min. periods

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<i>It's a Matter of Change and Energy</i>	13b	Transforming Energy	One of two activities explore concepts of energy within the context of human and bodily functions.	<ul style="list-style-type: none"> • work as a group, respect other people, work safely, and keep a clean work space • investigate how the body breaks down food to produce glucose, which is the body's main source of energy • identify parts of the digestive system • construct a 2-D or 3-D model of the digestive system • record data via charts or graphs • identify food sources from which people in various societies obtain nutrients 	<ul style="list-style-type: none"> • resource books • Internet access • plastic Ziplock baggie • half sheets of acetate or plastic • lemon juice • samples of foods such as crackers, bread, sliced meats, cheese, sugar, or sugar cubes • clear tape • scissors • table knife 	1 – 60 min. period + homework
<i>It's a Matter of Change and Energy</i>	14	Profile of a Product	Investigates the huge demand for non-renewable sources of energy in meeting the many demands of consumers for a host of products.	<ul style="list-style-type: none"> • work as a group, respect other people, work safely, and keep a clean work space • trace the evolution of a product from its raw beginnings to the consumer's home • recognize the energy resources consumed in the production and transportation of the product • distinguish between renewable and non-renewable resources • identify the source of materials found in a product and describe the steps required to modify the natural materials to make the product • identify types of industries involved in the processing and/or preserving of foods and materials 	<ul style="list-style-type: none"> • samples of commonly used items – equipment, toys, containers, or items of garbage • Internet access • research resources • posters/pictures related to energy consumption 	2 – 40 min. periods + homework

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<i>It's a Matter of Change and Energy</i>	15	Town Hall Meeting	Students evaluate the economic and environmental costs of energy resources and make a decision to accept or reject a proposal.	<ul style="list-style-type: none"> • work as a group, respect other people, work safely, and keep a clean work space • evaluate the economic and environmental costs of energy resources • describe ways to avoid wasting energy • pose questions and respond appropriately to the questions of others • communicate, in writing, ideas and information for a variety of purposes • organize and conduct interviews to gain information for a variety of purposes 	<ul style="list-style-type: none"> • resources on non-renewable energy sources • Internet access (optional) • Town Hall Meeting sheet (page 67) 	2 – 40 min. periods + homework
<i>It's a Matter of Change and Energy</i>	16	Wanted: Energy-Efficient Buildings	Investigates a problem and makes choices in finding ways to conserve energy with respect to daily living.	<ul style="list-style-type: none"> • work as a group, respect other people, work safely, and keep a clean work space • identify the forms of energy used in the home, school, and community and identify the energy source for each • create a design for a chalet that uses renewable resources • build a model of a renewable resource (wind power, water power, or solar power) • present plan and model to others 	<ul style="list-style-type: none"> • resources on renewable energy sources • Internet access • used copies of “home architect” magazines • cardboard boxes or shoe-boxes • dishpans • black garbage bags • tape • scissors • water • thermometer • tinfoil 	4 – 40 min. periods

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<i>It's a Team Effort</i>	17	Let's Talk Weather	Investigates how weather forecasts influence decisions concerning human activity and how humans have adapted to a variety of weather conditions.	<ul style="list-style-type: none"> • work as a cooperative group, respect other people, work safely, and keep a clean work space • use the terms weather, climate, and temperature • distinguish between weather and climate • determine the basic factors that influence weather • investigate how weather forecasts influence decisions concerning human activity • investigate how humans have adapted to a variety of weather conditions • formulate questions about needs and problems related to weather and explore possible answers and solutions 	<ul style="list-style-type: none"> • Internet access • resource books • art materials (paper, crayons, markers) • camera, tape recorder, and/or video camera for interview or survey purposes (optional) 	2 or 3 – 40 min. periods + homework
<i>It's a Team Effort</i>	18	Designing the Station	Designs, makes, and tests models of instruments to measure and collect weather data.	<ul style="list-style-type: none"> • work as a cooperative group, respect other people, work safely, and keep a clean work space • construct, redesign, and test a variety of instruments for measuring various features of the weather • use information gathered from local weather stations and other media to interpret weather • use the terms temperature, humidity, barometric pressure, windchill factor, precipitation, and cloud cover • set up a weather station in which the group will gather, record, and interpret readings • make predictions about the weather • compile data to record and present results 	<ul style="list-style-type: none"> • stations and materials (pages 26 to 38) • journal • Weather Recording Chart (page 39) • resource books 	8 – 30 min. periods over time

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<i>It's a Team Effort</i>	19	Water, Water All Around	Investigates stations that demonstrate the importance of water to weather conditions and describes the main types of clouds and how experts can predict weather from cloud types and movement.	<ul style="list-style-type: none"> • work as a cooperative group, respect other people, work safely, and keep a clean work space • explain the formation of clouds • use the vocabulary evaporation, condensation, and precipitation • describe the connection between the water cycle and weather • present learning to class 	<ul style="list-style-type: none"> • Water, Water All Around stations (pages 47 to 52) • journal 	7 – 20 min. periods
<i>It's a Team Effort</i>	20	The Bridge to Weather	Identifies and measures forces acting upon structures and describes the effects of their application.	<ul style="list-style-type: none"> • work as a cooperative group, respect other people, work safely, and keep a clean work space • design and build a bridge • test the load of his/her bridge • identify the parts of a structure that are under tension and those that are under compression when subjected to a load • present a design brief to class convincing others of bridge design • describe the advantages or disadvantages of bridge designs 	<ul style="list-style-type: none"> • cardboard (plain and corrugated) • tagboard • wood scraps • Styrofoam trays • toothpicks • wooden rods • miter box and saw • wooden stir sticks • pipe cleaners • straws • modeling clay • string • tape • white glue • glue gun • wire hook or coat hanger • bucket or pail to hold a load • load (such as blocks, marbles, cans of soup, etc.) 	3 or 4 – 40 min. periods

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<i>It's a Team Effort</i>	21	Taking the Load Off	Explores and investigates the force needed to lift a load with an inclined plane, lever, and screw.	<ul style="list-style-type: none"> • work as a group, respect other people, work safely, and keep a clean work space • work through the stations and compare the force needed to lift a load manually with the force required to lift a load with a simple machine (inclined plane, lever, and screw) • use the terms force, inclined plane, screw, and lever • understand and explain that the force applied to the machine is the effort while the force it overcomes is the load • describe the advantages and disadvantages of using different types of simple machines • create a comic strip showing the use of two simple machines to make work easier 	<ul style="list-style-type: none"> • Taking the Load Off stations (page 73 to 79) • journals 	6 – 30 min. periods
<i>It's a Team Effort</i>	22	Pulleying the Gears	Investigates different pulley systems to compare their advantages and disadvantages in lifting loads. Explores how gears are used to transmit a change in the direction or size of a force.	<ul style="list-style-type: none"> • work as a cooperative group, respect other people, work safely, and keep a clean work space • explore working with pulleys and gears • relate the working of pulleys and gears to the wheel and axle • investigate how different arrangements of pulleys can make work easier • discover that the force applied to the pulley is the effort while the force it overcomes is the load • explore different gear trains to discover gearing up and gearing down • describe, using their observations, the advantages and disadvantages of different types of mechanical systems • keep a record of findings and present results 	<ul style="list-style-type: none"> • Pulleying the Gears stations (pages 88 to 92) • journal • dowels, broom handles, sticks • reels – thread, ribbon • string • object to lift • other materials as required 	5 – 30 min. periods

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<i>It's a Team Effort</i>	23	Rube Goldberg, Move Over	Invites student to design a Rube Goldberg style machine that must accomplish a series of actions leading to a final task.	<ul style="list-style-type: none"> • work as a cooperative group, respect other people, work safely, and keep a clean work space • create a design for a machine • share in making a model of the machine • test how the machine functions and make modifications when necessary • present the design and model at an exhibition 	<ul style="list-style-type: none"> • wooden rods • dowels • miter box, saw, hand drill • gears • pulleys • cardboard • material scraps • wooden scraps • Styrofoam pieces • construction paper • Popsicle sticks • wooden BBQ sticks • pipe cleaners • string • variety of fasteners • other materials as required 	4 – 40 min. periods
<i>In Ancient Times</i>	24	Unearthing the Past	Identifies and compares the features of early civilizations and demonstrates the relationship between early civilizations and their environments.	<ul style="list-style-type: none"> • discuss factors influencing where people settle • choose places to settle in the Eastern Mediterranean • compare maps of the Eastern Mediterranean • identify key features and characteristics of civilizations • in a group, research and share findings on a particular ancient civilization • map location of ancient civilizations • compare ancient civilizations 	<ul style="list-style-type: none"> • thematic maps of the Eastern Mediterranean found in atlases (use the maps of world showing physical features, temperature, precipitation, and natural vegetation) • map of Eastern Mediterranean (page 67) • Unearthing the Past Research Checklist (page 61) 	8 – 40 min. periods and/or home-work

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<i>In Ancient Times</i>	25	The Past Lights Up	Designs and creates a system to lift a load. Identifies a major technological achievement of an early civilization.	<ul style="list-style-type: none"> • work as a cooperative group, respect other people, work safely, and keep a clean work space • formulate and answer questions about the best type of devices to build • create working model(s) • present working model(s) to the class • discuss ways of improving model(s) 	<ul style="list-style-type: none"> • gears • pulleys • wooden rods • saw and miter box • cardboard gussets (triangles) • glue gun • string • safety goggles • pulley and gear-building set • dowels • S hooks 	3 or 4 – 40 min. periods
<i>In Ancient Times</i>	26	A Colossal Undertaking	Identifies and compares design and technology of early civilizations to those of today. Also identifies the parts of a structure that are under tension or under compression when subjected to a load.	<ul style="list-style-type: none"> • work as a cooperative group, respect other people, work safely, and keep a clean work space • discuss architectural wonders • list criteria to be used when selecting top ten architectural list • research structures to determine if they are worthy of placement on the list • identify parts of structure under tension and compression • listen carefully to presentations by peers • participate in discussions at the end of the presentations 	<ul style="list-style-type: none"> • Seven Wonders of the Ancient World map (page 60) • resource books with an architectural focus • Internet access • materials as requested by students for presentation 	2 or 3 – 40 min. periods + homework

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<i>In Ancient Times</i>	27	Who Decides?	Identifies the positive and negative aspects of various government structures and researches the workings of modern governmental systems	<ul style="list-style-type: none"> • work as a cooperative group, respect other people, work safely, and keep a clean work space • participate in decision-making discussions • identify the positive and negative aspects of various government structures • research the workings of America's government system and that of ancient Athens • critique the governments of modern America and ancient Athens 	<ul style="list-style-type: none"> • resource books • Internet access • Who Decides? Chart (page 39) 	4 – 40 min. periods
<i>In Ancient Times</i>	28	Travelling Over the Isthmus	Investigates systems that move a boat across land. Compares the technologies of today with those of early civilizations.	<ul style="list-style-type: none"> • work as a cooperative group, respect other people, work safely, and keep a clean work space • construct a device for moving a toy boat across land • discuss how your device might be similar to or different from what the ancient Greeks might have constructed • draw or sketch what the ancient Greek boat-hauling device might have looked like • share drawing or sketch with the class 	<ul style="list-style-type: none"> • small toy boat or an object representing a boat for each group • container with building materials (e.g., gears, pulleys, cardboard, dowels, saw, miter box, glue, paper towel rolls, modeling clay, and string) • pictures of the diolkos (page 46) • other materials as required 	2 or 3 – 40 min. periods
<i>In Ancient Times</i>	29	Onward to Olympia	Identifies, through research, some of the values and beliefs on which life in early civilizations was based.	<ul style="list-style-type: none"> • work as a cooperative group, respect other people, work safely, and keep a clean work space • determine a list of sports to be included in the Olympics and provide rationale • present ideas to the class • research similarities and differences between the ancient and modern games 	<ul style="list-style-type: none"> • books on the ancient and modern Olympic Games • Internet access • materials as requested by students for presentation 	3 – 40 min. periods

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<i>In Ancient Times</i>	30	Worthy of Immortality	Identifies various sources of information, such as myths and legends, for understanding the past.	<ul style="list-style-type: none"> • work as a cooperative group, respect other people, work safely, and keep a clean work space • brainstorm ways of finding out about the past • rank the different sources for finding out about the past • research the accuracy of the story line • present research findings to the class 	<ul style="list-style-type: none"> • books containing myths and legends • Internet access • examples of some myths 	4 – 40 min. periods + homework

* Timing will vary based on student's new inquiries from original investigation and how many activities from Connecting the Curriculum are introduced. Please remember Language Arts activities are integrated into each investigation.