Ark Community Charter School
Science Curriculum Framework – Grade 5

Suggested Pacing	Units	New York State Standards	New York State Skills Standards	New York State Performance Indicators	Assessments
When and in what order will the standards be taught and assessed?	What are your unit titles	What should students know? Optional: You can also identify essential questions based on the content standards.)	What should students be able to do? **(Assessed) will be bolded below,** the rest will be practiced (P) at this grade level.	What qualities of the physical and living environment will the students will be able to observe or describe? **(Assessed) will be bolded below,** the rest will be practiced (P) at this grade level.	What specific tools will be used to assess which content bolded standard or skills standard at this grade level?
Scientific Procedure will be practiced and assessed	Motion and design kit	STANDARD 1- Analysis, Inquiry, and Design: SCIENTIFIC INQUIRY:	***Key Idea 1:*** **The central purpose of scientific inquiry is to develop explanations of natural phenomena in a continuing, creative process.** **S1.1 Ask "why" questions in attempts to seek greater understanding concerning objects and events they have observed and heard about.** **S1.1a Observe and discuss objects and events and record observations** **S1.1b Articulate appropriate questions based on observations** **S1.2 Question the explanations they hear from others and read about, seeking clarification and comparing them with their own observations and understandings.** **S1.2a Identify similarities and differences between explanations received from others or in print and personal observations or understandings** **S1.3 Develop relationships among observations to construct descriptions of objects and events and to form their own**		Assessed in written scientific reports and worksheets for each unit

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			tentative explanations of what they have observed. **S1.3a Clearly express a tentative explanation or description which can be tested** ***Key Idea 2:*** **Beyond the use of reasoning and consensus, scientific inquiry involves the testing of proposed explanations involving the use of conventional techniques and procedures and usually requiring considerable ingenuity.** **S2.1 Develop written plans for exploring phenomena or for evaluating explanations guided by questions or proposed explanations they have helped formulate.** **S2.1a Indicate materials to be used and steps to follow to conduct the investigation and describe how data will be recorded (journal, dates and times, etc.)** **S2.2 Share their research plans with others and revise them based on their suggestions.** **S2.2a Explain the steps of a plan to others, actively listening to their suggestions for possible modification of the plan, seeking clarification and understanding of the suggestions and modifying the plan where appropriate** **S2.3 Carry out their plans for exploring phenomena through direct observation and through the use of simple instruments that permit measurement of quantities, such as length, mass, volume, temperature, and time.** **S2.3a Use appropriate "inquiry and process skills" to collect data** **S2.3b Record observations accurately and concisely** ***Key Idea 3:*** **The observations made while testing proposed explanations, when analyzed using conventional and invented methods, provide new insights into phenomena.** **S3.1 Organize observations and measurements of objects and events through classification and the preparation of simple charts and tables.** **S3.1a Accurately transfer data from a science journal or notes to appropriate graphic organizer** **S3.2 Interpret organized observations and measurements, recognizing simple patterns, sequences, and relationships.**	**To fulfill S2.3 students be introduced to using the following tools:** **•hand lens** **•ruler (metric)** **•thermometer (C °,F °)** **•measuring cups** **•graduated cylinder** **Venn diagram** **Bar Graphs** **Line graphs** **Tables**	

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			S3.2a State, orally and in writing, any inferences or generalizations indicated by the data collected **S3.3 Share their findings with others and actively seek their interpretations and ideas.** **S3.3a Explain their findings to others, and actively listen to suggestions for possible interpretations and ideas** **S3.4 Adjust their explanations and understandings of objects and events based on their findings and new ideas.** **S3.4a State, orally and in writing, any inferences or generalizations indicated by the data, with appropriate modifications of their original prediction/explanation** **S3.4b State, orally and in writing, any new questions that arise from their investigation**		
		Standard 6: Interconnectedness: Common Themes	**Students will understand the relationships and common themes that connect mathematics, science, and technology and apply the themes to these and other areas of learning.** ***Key Idea 1:*** **Through systems thinking, people can recognize the commonalities that exist among all systems and how parts of a system interrelate and combine to perform specific functions.**	•observe and describe interactions among components of simple systems •identify common things that can be considered to be systems (e.g., a plant, a transportation system, human beings)	
	All Units	Standard 7: Interdisciplinary Problem Solving Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.	**Connections** ***Key Idea 1:*** **The knowledge and skills of mathematics, science, and technology are used together to make informed decisions and solve problems, especially those relating to issues of science/technology/society, consumer decision making, design, and inquiry into phenomena.** **Strategies** ***Key Idea 2:*** **Solving interdisciplinary problems involves a variety of skills and strategies, including effective work habits; gathering and processing information; generating and analyzing ideas; realizing ideas; making connections among the common themes of mathematics, science, and technology; and presenting results.**	•analyze science/technology/society problems and issues that affect their home, school, or community, and carry out a remedial course of action •make informed consumer decisions by applying knowledge about the attributes of particular products and making cost/benefit trade-offs to arrive at an optimal choice •design solutions to problems involving a familiar and real context, investigate related science concepts to determine the solution, and use mathematics to model, quantify, measure, and compute •observe phenomena and evaluate them scientifically and mathematically by conducting a fair test of the effect of variables and using mathematical knowledge and technological tools to collect, analyze, and present data and conclusions	

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			Working Effectively –contributing to the work of a brainstorming group, laboratory partnership, cooperative learning group, or project team; planning procedures; identifying and managing responsibilities of team members; and staying on task, whether working alone or as part of a group **Gathering and Processing Information –accessing information from printed media, electronic databases, and community resources; using the information to develop a definition of the problem and to research possible solutions** **Generating and Analyzing Ideas –developing ideas for proposed solutions, investigating ideas, collecting data, and showing relationships and patterns in the data** **Common Themes –observing examples of common unifying themes, applying them to the problem, and using them to better understand the dimensions of the problem** **Realizing Ideas –constructing components or models, arriving at a solution, and evaluating the results** **Presenting Results – using a variety of media to present the solution and to communicate the results**		
Sept	**Recycling**	**STANDARD 4: The Physical Setting & Living Environment**	**Key Idea 7:** **Human decisions and activities have had a profound impact on the physical and living environment.**	**7.2a In ecosystems, balance is the result of interactions between community members and their environment.** **7.2b The environment may be altered through the activities of organisms. Alterations are sometimes abrupt. Some species may replace others over time, resulting in longterm gradual changes (ecological succession).** **7.2c Overpopulation by any species impacts the environment due to the increased use of resources. Human activities can bring about environmental degradation through resource acquisition, urban growth, land-use decisions, waste disposal, etc.** **7.2d Since the Industrial Revolution, human activities have resulted in major pollution of air, water, and soil. Pollution has cumulative ecological effects such as acid rain, global warming, or ozone depletion. The survival**	**Maintaining recycling through out the school and teaching K-4 class about recycling**

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				of living things on our planet depends on the conservation and protection of Earth's resources.	
Oct-Dec	**Human Systems**	**STANDARD 4: Living Environment**	**Explain the functioning of the major human organ systems and their interactions.**	**Major Understandings:** **1.2a Each system is composed of organs and tissues which perform specific functions and interact with each other, e.g., digestion, gas exchange, excretion, circulation, locomotion, control, coordination, reproduction, and protection from disease.** **1.2b Tissues, organs, and organ systems help to provide all cells with nutrients, oxygen, and waste removal.** **1.2c The digestive system consists of organs that are responsible for the mechanical and chemical breakdown of food. The breakdown process results in molecules that can be absorbed and transported to cells.** **1.2d During respiration, cells use oxygen to release the energy stored in food. The respiratory system supplies oxygen and removes carbon dioxide (gas exchange).** **1.2e The excretory system functions in the disposal of dissolved waste molecules, the elimination of liquid and gaseous wastes, and the removal of excess heat energy.** **1.2f The circulatory system moves substances to and from cells, where they are needed or produced, responding to changing demands.** **1.2g Locomotion, necessary to escape danger, obtain food and shelter, and reproduce, is accomplished by the interaction of the skeletal and muscular systems, and coordinated by the nervous system.** **1.2h The nervous and endocrine systems interact to control and coordinate the body's responses to changes in the environment, and to regulate growth, development, and reproduction. Hormones are chemicals produced by the endocrine system; hormones regulate many body functions.** **1.2i The male and female reproductive systems are**	**Complete chapter on Human Systems in Scott Foresman Science book and completion of Macro and micro in art class**

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			Describe the importance of major nutrients, vitamins, and minerals in maintaining health and promoting growth, and explain the need for a constant input of energy for living organisms.	**responsible for producing sex cells necessary for the production of offspring.** **1.2j Disease breaks down the structures or functions of an organism. Some diseases are the result of failures of the system. Other diseases are the result of damage by infection from other organisms (germ theory). Specialized cells protect the body from infectious disease. The chemicals they produce identify and destroy microbes that enter the body.** **5.1f Regulation of an organism's internal environment involves sensing the internal environment and changing physiological activities to keep conditions within the range required for survival. Regulation includes a variety of nervous and hormonal feedback systems.** **5.2a Food provides molecules that serve as fuel and building material for all organisms. All living things, including plants, must release energy from their food, using it to carry on their life processes.** **5.2b Foods contain a variety of substances, which include carbohydrates, fats, vitamins, proteins, minerals, and water. Each substance is vital to the survival of the organism.** **5.2c Metabolism is the sum of all chemical reactions in an organism. Metabolism can be influenced by hormones, exercise, diet, and aging.** **5.2d Energy in foods is measured in Calories. The total caloric value of each type of food varies. The number of Calories a person requires varies from person to person.** **5.2e In order to maintain a balanced state, all organisms have a minimum daily intake of each type of nutrient based on species, size, age, sex, activity, etc. An imbalance in any of the nutrients might result in weight gain, weight loss, or a diseased state.** **5.2f Contraction of infectious disease, and personal**	

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				behaviors such as use of toxic substances and some dietary habits, may interfere with one's dynamic equilibrium. During pregnancy these conditions may also affect the development of the child. Some effects of these conditions are immediate; others may not appear for many years.	
Jan-March	**Motion and design**	**STANDARD 4: The Physical Setting**	**Describe different patterns of motion of objects.** **Observe, describe, and compare effects of forces (gravity, electric current, and magnetism) on the motion of objects.**	**5.1a The motion of an object is always judged with respect to some other object or point. The idea of absolute motion or rest is misleading.** **5.1b The motion of an object can be described by its position, direction of motion, and speed.** **5.1c An object's motion is the result of the combined effect of all forces acting on the object. A moving object that is not subjected to a force will continue to move at a constant speed in a straight line. An object at rest will remain at rest.** **5.1d Force is directly related to an object's mass and acceleration. The greater the force, the greater the change in motion.** **5.1e For every action there is an equal and opposite reaction.** **5.2b Electric currents and magnets can exert a force on each other.** **5.2c Machines transfer mechanical energy from one object to another.** **5.2d Friction is a force that opposes motion.** **5.2e A machine can be made more efficient by reducing friction. Some common ways of reducing friction include lubricating or waxing surfaces.** **5.2f Machines can change the direction or amount of force, or the distance or speed of force required to do work.** **5.2g Simple machines include a lever, a pulley, a wheel**	**completion of Motion and Design Kit by Carolina Biologic**

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				and axle, and an inclined plane. A complex machine uses a combination of interacting simple machines, e.g., a bicycle.	
March - June	**Natural Disasters**	**STANDARD 4: The Physical Setting**	**Describe volcano and earthquake patterns, the rock cycle, and weather and climate changes.**	**2.2a The interior of Earth is hot. Heat flow and movement of material within Earth cause sections of Earth's crust to move. This may result in earthquakes, volcanic eruption, and the creation of mountains and ocean basins.** **2.2b Analysis of earthquake wave data (vibrational disturbances) leads to the conclusion that there are layers within Earth. These layers the crust, mantle, outer core, and inner core have distinct properties.** **2.2c Folded, tilted, faulted, and displaced rock layers suggest past crustal movement.** **2.2d Continents fitting together like puzzle parts and fossil correlations provided initial evidence that continents were once together.** **2.2e The Theory of Plate Tectonics explains how the solid lithosphere consists of a series of plates that float on the partially molten section of the mantle. Convection cells within the mantle may be the driving force for the movement of the plates.** **2.2f Plates may collide, move apart, or slide past one another. Most volcanic activity and mountain building occur at the boundaries of these plates, often resulting in earthquakes.** **2.2g Rocks are classified according to their method of formation. The three classes of rocks are sedimentary, metamorphic, and igneous. Most rocks show characteristics that give clues to their formation conditions.** **2.2h The rock cycle model shows how types of rock or rock material may be transformed from one type of rock to another.**	**Completion and Presentation of Natural Disaster research paper, backdrops, weather video and poems**

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				2.2i Weather describes the conditions of the atmosphere at a given location for a short period of time. **2.2j Climate is the characteristic weather that prevails from season to season and year to year.** **2.2k The uneven heating of Earth's surface is the cause of weather.** **2.2l Air masses form when air remains nearly stationary over a large section of Earth's surface and takes on the conditions of temperature and humidity from that location.** **Weather conditions at a location are determined primarily by temperature, humidity, and pressure of air masses over that location.** **2.2m Most local weather condition changes are caused by movement of air masses.** **2.2n The movement of air masses is determined by prevailing winds and upper air currents.** **2.2o Fronts are boundaries between air masses. Precipitation is likely to occur at these boundaries.** **2.2p High-pressure systems generally bring fair weather. Low-pressure systems usually bring cloudy, unstable conditions. The general movement of highs and lows is from west to east across the United States.** **2.2q Hazardous weather conditions include thunderstorms, tornadoes, hurricanes, ice storms, and blizzards. Humans can prepare for and respond to these conditions if given sufficient warning.** **2.2r Substances enter the atmosphere naturally and from human activity. Some of these substances include dust from volcanic eruptions and greenhouse gases such as carbon dioxide, methane, and water vapor. These substances can affect weather, climate, and living things.**	