BATAVIA PUBLIC SCHOOLS
District 101
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Elementary Science
Grade K

Subject Expectation 1 (State Goal 11)		**The student will understand the processes of scientific inquiry and technological design to investigate questions, conduct experiments and solve problems.**
Essential Learning 1 (Learning Standard A)		Know and apply the concepts, principles, and processes of scientific inquiry
Critical Content	11.A.Ka	a. use the five senses to explore and observe materials
	11.A.Kb	b. begin to develop questions on scientific topics
	11.A.Kc	c. seek information through observation, exploration, and investigation of questions
	11.A.Kd	d. collect, describe, compare and record information *such as* charting, journaling, lab reporting
	11.A.Kd	e. recognize and describe patterns, noting similarities and differences, and draw conclusions
	11.A.Kd	f. discuss the relevance of an idea
Essential Learning 2 (Learning Standard B)		Know and apply concepts, principles, and processes of technological design
Critical Content	11.B.Ka	a. use simple tools and equipment to enhance observation and gather data
	11.B.Kb	b. describe steps to test a design
Subject Expectation 2 (State Goal 12)		**The student will understand the fundamental concepts, principles, and interconnections of life physical, and earth/space sciences.**
Essential Learning 1 (Learning Standard A)		Know and apply concepts that explain how things function, adapt, and change.
Critical Content	12.A.1a	a. Observe animals and compare the structures
		b. Describe parts of a tree
	12.A.1b	c. Compare similarities and differences of animals
		d. Compare trees for similarities and differences
Essential Learning 2 (Learning Standard B)		Know and apply concepts that describe how living things interact with each other and with their environment.
Critical Content	12.B.1a	a. Describe the structure and behavior of animals
Essential Learning 3 (Learning Standard C)		Know and apply concepts that describe properties of matter and energy and the interactions between them
Critical Content	12.C.1b	a. Compare the properties of different fabrics, wood, and paper
Essential Learning 4 (Learning Standard D)		Know and apply concepts that describe force and motion and the principles that explain them
Critical Content	12.D.1a	a. Compare the methods of movement between various animals
	12.D.1b	b. Compare how fast water soaks into different types of wood
		c. Compare how different kinds of paper absorb glue
Essential Learning 5 (Learning Standard E)		Know and apply concepts that describe the features and processes of the Earth and its resources
This concept is not taught in this grade		

Essential Learning 6 (Learning Standard F)		Know and apply concepts that explain the composition and structure of the universe and Earth's place in it
	12.F.1b	a. Identify the seasonal changes of trees
		b. Compare changes in parts of trees through the seasons
Subject Expectation 3 (State Goal 13)		**The student will understand the relationships among science, technology and society in historical and contemporary contexts**
Essential Learning 1 (Learning Standard A)		Know and apply the accepted practices of science
Critical Content	13.A.Ka	a. begin to understand and use basic safety practices • demonstrate responsible use of equipment and adherence to procedures *such as* no magnets on computers • explain why one should never taste an unknown substance
	13.A.Kb	b. use observation skills to learn to document changes in science
	13.A.Kb	c. know that ideas can be evaluated through observation and measurement such as growing seeds with and without sun or water
	13.A.Kc	d. determine and explain relevant information
	13.A.Kc	e. participate productively in scientific conversations
	13.A.Kb	f. explore scale models as a representation of ideas such as the globe is a model of the earth
Essential Learning 2 (Learning Standard C)		Know and apply concepts that describe the interaction between science, technology, and society.
Critical Content	13.B.Ka	a. express curiosity and ask questions about their world
	13.B.Kb	b. recognize common scientific instruments including a ruler, thermometer, balance scale, magnifying glass, and computer
	13.B.Kc	c. form explanations and communicate scientific information
	13.B.Kd	d. recognize that technology affects their lives
	13.B.Ke	e. begin to understand ways to reduce, reuse, and recycle materials

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Elementary Science
Grade 1

Subject Expectation 1 (State Goal 11)		**The student will understand the processes of scientific inquiry and technological design to investigate questions, conduct experiments and solve problems.**
Essential Learning 1 (Learning Standard A)		Know and apply the concepts, principles, and processes of scientific inquiry
Critical Content	11.A.1a	a. describe an observed event using words, diagram, or graphs
	11.A.1b	b. develop questions on scientific topics
	11.A.1c	c. collect data for investigations using measuring instruments and technologies
	11.A.1d	d. record and store data using available technologies *such as* charting, journaling, lab reporting
	11.A.1e	e. arrange data into logical patterns and describe the patterns
	11.A.1e	f. draw conclusions from data
	11.A.1f	g. compare observations, and question individual and group results
Essential Learning 2 (Learning Standard B)		Know and apply concepts, principles, and processes of technological design
Critical Content	11.B.1a	a. given a simple design problem, formulate possible solutions and questions such as how to design a tower of solids
	11.B.1b	b. design a tower
	11.B.1c	c. build the tower using the materials provided
	11.B.1d d	d. test the tower and make changes
	11.B.1e	e. communicate the design of the tower of solids
Subject Expectation 2 (State Goal 12)		**The student will understand the fundamental concepts, principles, and interconnections of life physical, and earth/space sciences.**
Essential Learning 1 (Learning Standard A)		Know and apply concepts that explain how things function, adapt, and change.
Critical Content	12.A.2a	a. observe larvae, pupae, and adults over time
	12.A.1b	b. describe and record changes in insects' structures and behaviors over time
Essential Learning 2 (Learning Standard B)		Know and apply concepts that describe how living things interact with each other and with their environment.
Critical Content	12.B.1a	a. Observe the sequence of changes that insects go through as they mature into adults
	12.B.1b	b. Describe and record changes of insects' structures and behaviors over time
Essential Learning 3 (Learning Standard C)		Know and apply concepts that describe properties of matter and energy and the interactions between them
Critical Content	12.C.1a	a. Learn to measure and record temperature using a thermometer
	12.C.1b	b. Observe the properties of air as it interacts with other materials and when it is put under pressure
	12.C.1b	c. Observe and compare properties of solid materials
		d. Observe and describe properties of different liquids in bottles

Essential Learning 4 (Learning Standard D)		Know and apply concepts that describe force and motion and the principles that explain them
Critical Content	12.D.1a	a. Observe the action of moving air
	12.D.1b	b. Observe the properties of air when it is put under pressure
Essential Learning 5 (Learning Standard E)		Know and apply concepts that describe the features and processes of the Earth and its resources
Critical Content	12.E.1a	a. Observe and compare cloud types
	12.E.1b	b. Observe and record daily weather
	12.E.1b	c. Organize and graph class weather data recorded for a month
Essential Learning 6 (Learning Standard F)		Know and apply concepts that explain the composition and structure of the universe and Earth's place in it
This concept is not taught in this grade		
Subject Expectation 3 (State Goal 13)		**The student will understand the relationships among science, technology and society in historical and contemporary contexts**
Essential Learning 1 (Learning Standard A)		Know and apply the accepted practices of science
Critical Content	13.A.1a	a. apply the appropriate principles of safety • use established classroom safety, order, and cleanliness rules during science inquiry or design investigations • apply general science rules in playground settings • role-play what should be done in case of fire • reinforce decision-making skills related to the promotion and protection of individual health
	13.A.1b	b. know that ideas can be evaluated through observation and measurement
	13.A.1c	c. explain how knowledge can be gained by careful observation
	13.A.1c	d. rely on reasoning to connect ideas and data
	13.A.1b	e. determine and explain relevant information
	13.A.1b	f. participate productively in science discussions
Essential Learning 2 (Learning Standard C)		Know and apply concepts that describe the interaction between science, technology, and society.
Critical Content	13.B.1a	a. list the uses of common scientific instruments *such as* ruler, thermometer, computer, anemometer, wind vane
	13.B.1a	b. explore scale models as a representation of ideas *such as* the globe is a model of the earth
	13.B.1b	c. list how using measuring tools improves the accuracy of estimates
	13.B.1c	d. list how scientists have advanced our knowledge in real life
	13.B.1d	e. list ways that science and technology affect people's everyday lives *such as* school personnel
	13.B.1e	f. list ways to reduce, reuse and recycle materials

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Elementary Science
Grade 2

Subject Expectation 1 (State Goal 11)		**The student will understand the processes of scientific inquiry and technological design to investigate questions, conduct experiments and solve problems.**
Essential Learning 1 (Learning Standard A)		Know and apply the concepts, principles, and processes of scientific inquiry
Critical Content	11.A.1a	a. describe an observed event
	11.A.1b	b. develop questions on scientific topics and predict conditions that can influence change
	11.A.1c	c. collect data for investigations using measuring instruments and technologies
	11.A.1c	d. draw conclusions from data
	11.A.1d	e. record and store data using available technologies *such as* charting, journaling, lab reporting
	11.A.1e	f. organize and analyze data into logical patterns and describe the patterns
	11.A.1f	g. compare observations of individual and group results
Essential Learning 2 (Learning Standard B)		Know and apply concepts, principles, and processes of technological design
Critical Content	11.B.1a	a. given a simple design problem, formulate possible solutions and questions such as how to design a roller
	11.B.1b	b. design a device that will be useful in solving the problem
	11.B.1c	c. build the device using the materials and tools provided
	11.B.1d	d. test the device and record results using given instruments, techniques and measurement methods after repeated trials
	11.B.1e	e. communicate the design of the device, the test process and the results in solving a given problem
Subject Expectation 2 (State Goal 12)		**The student will understand the fundamental concepts, principles, and interconnections of life physical, and earth/space sciences.**
Essential Learning 1 (Learning Standard A)		Know and apply concepts that explain how things function, adapt, and change.
Critical Content	12.A.1a	a. observe the growth of seeds
	12.A.1b	b. compare the development of different kinds of plants
Essential Learning 2 (Learning Standard B)		Know and apply concepts that describe how living things interact with each other and with their environment.
	12.B.1a	a. Identify that plants need water, air, nutrients, and light to grow and develop
Critical Content	12.B.1b	b. identify bees and other insects that help some plants by moving pollen from flower to flower
Essential Learning 3 (Learning Standard C)		Know and apply concepts that describe properties of matter and energy and the interactions between them
Critical Content	12.C.1b	a. organize materials to make systems that exhibit rotational motion
	12.C.1b	b. observe plant development
	12.C.1b	c. observe several kinds of rocks

	12.C.1b	d. compare properties of different rocks
	12.C.1b	e. sort rocks in different ways
	12.C.1b	f. observe properties of pebbles, gravel, sand, silt, and clay particles
	12.C.1b	g. separate and group river rocks based on particle size by using screens
	12.C.1b	h. separate and observe sand and silt in water
	12.C.1b	i. observe the properties of clay particles when dry and when wet
	12.C.1b	j. observe and compare different grades of sandpaper
	12.C.1b	k. observe the properties of clay that make it useful in creating jewelry or beads
	12.C.1b	l. observe how the properties of clay are used to make bricks
Essential Learning 4 (Learning Standard D)		Know and apply concepts that describe force and motion and the principles that explain them
Critical Content	12.D.1a	a. observe several expressions of rotational motion
	12.D.1a	b. observe rotation of a system falling through air
	12.D.1a	c. communicate observations and comparisons of rotational motion, using precise vocabulary
	12.D.1a	d. observe several expressions of linear motion
	12.D.1a	e. observe several kinds of objects and systems that roll
	12.D.1a	f. communicate observations and comparisons of rolling motion, using precise vocabulary
	12.D.1b	g. organize materials to make systems that exhibit rotational motion
	12.D.1b	h. organize materials to make systems that roll in different ways
Essential Learning 5 (Learning Standard E)		Know and apply concepts that describe the features and processes of the Earth and its resources
Critical Content	12.E.1c	a. understand some plants die and some plants continue to grow after they are mowed
	12.E.1c	b. Identify evidence that a cutting will develop into a new plant
Essential Learning 6 (Learning Standard F)		Know and apply concepts that explain the composition and structure of the universe and Earth's place in it
Subject Expectation 3 (State Goal 13)		**The student will understand the relationships among science, technology and society in historical and contemporary contexts**
Essential Learning 1 (Learning Standard A)		Know and apply the accepted practices of science
Critical Content	13.A.1a	a. apply the appropriate principles of safety • refrain from tasting unknown substances • map pathways to leave classroom or home in case of fire or severe weather situations
	13.A.1b	b. apply scientific habits of mind • propose ways to test student-generated predictions for science-conceptual relationships • practice how scientists generate questions for possible studies • relate knowledge that was gained through careful, repeated observations by classmates • distinguish hypotheses from guesses • know that ideas can be evaluated through observation and measurement • rely on reasoning to connect ideas and data
	13.A.1b	c. discuss the relevance of an idea *such as* the color of the flower is not important in recording data, but how much it grew when in the sunlight is important
	13.A.1c	d. participate productively in scientific conversations

Essential Learning 2 (Learning Standard C)		Know and apply concepts that describe the interaction between science, technology, and society.
Critical Content	13.B.1a	a. explain the uses of common scientific instruments *such as* rule, balance
	13.B.1b	b. explore scale models as a representation of ideas *such as* the globe is a model of the earth
	13.B.1b	c. explain how using measuring tools improves the accuracy of estimates
	13.B.1c	d. describe a scientist and his or her contributions to science and technology
	13.B.1d	e. list ways that science and technology affect people's everyday lives *such as* community workers
	13.B.1e	f. list ways to reduce, reuse and recycle materials

Elementary Science
Grade 3

Subject Expectation 1 (State Goal 11)		**The student will understand the processes of scientific inquiry and technological design to investigate questions, conduct experiments and solve problems.**
Essential Learning 1 (Learning Standard A)		Know and apply the concepts, principles, and processes of scientific inquiry
Critical Content	11.A.2a	a. brainstorm and refine questions on a specific science topic
	11.A.2b	b. create a hypothesis statement
	11.A.2c	c. propose procedural steps to investigate the hypothesis
	11.A.2d	d. collect data for investigations using scientific process skills including observing, estimating, and measuring
	11.A.2d	e. coordinate evidence to build and refine theories
	11.A.2e	f. construct charts, tables or notebooks to record data or use diagrams, figures, visualizations, and mathematical representations to convey complex ideas, patterns, or trends
	11.A.2f	g. analyze data trends and summarize inferences
	11.A.2f	h. produce reasonable explanations for or against models and theories
	11.A.2g	i. present the results of the observations and explanations orally or in written format
Essential Learning 2 (Learning Standard B)		Know and apply concepts, principles, and processes of technological design
Critical Content	11.B.2a	a. identify a design problem and propose possible solutions and questions *such as* how to light a light bulb
	11.B.2b	b. develop a plan, design and procedure to address the problem identifying constraints, materials, technology of a series or parallel circuit
	11.B.2c	c. build a circuit using available tools and materials
	11.B.2d	d. test the circuit using suitable instruments, techniques, and quantitative measurements to record data
	11.B.2e	e. assess test results and the effectiveness of the design using given criteria and noting possible sources of error
	11.B.2f	f. report test design, test process, and test results
Subject Expectation 2 (State Goal 12)		**The student will understand the fundamental concepts, principles, and interconnections of life physical, and earth/space sciences.**
Essential Learning 1 (Learning Standard A)		Know and apply concepts that explain how things function, adapt, and change.
Critical Content	12.A.2b	a. Observe and describe the bones, joints, and muscles that move when the hand and foot respond.
	12.A.2b	b. Compare the response time of the right hand, left hand, right foot, and left foot.
	12.A.2b	c. Describe the effect of practice on response time.
Essential Learning 2 (Learning Standard B)		Know and apply concepts that describe how living things interact with each other and with their environment.
Critical Content	12.B.2a	a. Observe and describe the movement of the body while jumping rope
	12.B.2b	b. Compare one's own body to skeleton photos and diagrams

	12.B.2a	c. Observe and describe the workings of muscles to move bones
	12.B.2b	d. Compare the muscle/bone functions of a model leg to human leg and a model thumb to a human thumb.
Essential Learning 3 (Learning Standard C)		Know and apply concepts that describe properties of matter and energy and the interactions between them
Critical Content	12.C.2a	a. Build a circuit using available tools and materials
	12.C.2a	b. Test materials for conductivity
	12.C.2b	c. Identify properties of rocks and minerals
	12.C.2b	d. Identify minerals as the basic earth materials that make up rocks
		e. Record and organize results of investigations
Essential Learning 4 (Learning Standard D)		Know and apply concepts that describe force and motion and the principles that explain them
Critical Content	12.D.2b	a. Compare interactions between two magnets
	12.D.2b	b. Discuss forces of attraction between magnets
	12.D.2b	c. Understand the difference between a permanent and temporary magnet
		d. Record and organize results of investigations
Essential Learning 5 (Learning Standard E)		Know and apply concepts that describe the features and processes of the Earth and its resources
This concept is not taught in this grade		
Essential Learning 6 (Learning Standard F)		Know and apply concepts that explain the composition and structure of the universe and Earth's place in it
	12.F.2a	a. Observe and record changes in the Moon's appearance over a month
	12.F.2a	c. Analyze observations to discover the sequence of changes that occur during the Moon's phase cycle
	12.F.2a	d. Use models to develop explanations
	12.F.2b	e. Observe and record the path the Sun takes in the sky
	12.F.2b	f. Observe and collect shadow data at different times of the day
	12.F.2b	g. Analyze shadow data to develop an explanation about the Sun's daily movements
	12.F.2b	h. Use shadow data to predict the position of the Sun in the sky
	12.F.2c	i. Identify several constellations as stable predictable patterns of stars
	12.F.2c	j. Use models and simulations to develop explanations
Subject Expectation 3 (State Goal 13)		**The student will understand the relationships among science, technology and society in historical and contemporary contexts**
Essential Learning 1 (Learning Standard A)		Know and apply the accepted practices of science
Critical Content	13.A.2a	a. demonstrate ways to avoid injury when conducting science activities
	13.A.2b	b. know that ideas can be evaluated through observation and measurement
	13.A.2b	c. explain why similar results are expected when procedures are done the same way and explain why investigations may not produce similar results
	13.A.2b	d. participate productively in scientific discussion
	13.A.2c	e. determine and explain relevant information
	13.A.2c	f. explain why keeping accurate and detailed records is important
Essential Learning 2 (Learning Standard C)		Know and apply concepts that describe the interaction between science, technology, and society.
Critical Content	13.B.2a	a. explain how scientific technology is used in science for a variety of purposes *such as* sample collection, storage and treatment;

		measurement; data collection, storage and retrieval; communication of information
	13.B.2b	b. describe the effects on society of scientific and technological innovations *such as* electricity
	13.B.2c	c. identify and explain ways that science and technology influence the lives and careers of people
	13.B.2e	d. identify and explain ways that technology changes ecosystems
	13.B.2f	e. analyze how specific personal and societal choices that humans make affect local, regional and global ecosystems *such as* use of electricity

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Elementary Science
Grade 4

Subject Expectation 1 (State Goal 11)		**The student will understand the processes of scientific inquiry and technological design to investigate questions, conduct experiments and solve problems.**
Essential Learning 1 (Learning Standard A)		Know and apply the concepts, principles, and processes of scientific inquiry
Critical Content	11.A.2a	a. brainstorm and refine questions on a specific science topic
	11.A.2b	b. create a hypothesis statement
	11.A.2c	c. propose procedural steps to investigate the hypothesis
	11.A.2d	d. collect data for investigations using scientific process skills including observing, estimating, and measuring
	11.A.2d	e. coordinate evidence to build and refine theories
	11.A.2e	f. construct charts, tables or notebooks to record data or use diagrams, figures, visualizations, and mathematical representations to convey complex ideas, patterns, or trends
	11.A.2f	g. analyze data trends and summarize inferences
	11.A.2g	h. present the results of the observations and explanations orally or in written format
	11.A.2h	i. produce reasonable explanations for or against models and theories
Essential Learning 2 (Learning Standard B)		Know and apply concepts, principles, and processes of technological design
Critical Content	11.B.2a	a. identify a design problem and propose possible solutions and questions
	11.B.2b	b. develop a plan, design and procedure to address the problem identifying constraints *such as* time, materials, technology
	11.B.2c	c. build a prototype of the design using available tools and materials
	11.B.2d	d. test the prototype using suitable instruments, techniques, and quantitative measurements to record data
	11.B.2e	e. assess test results and the effectiveness of the design using given criteria and noting possible sources of error
	11.B.2f	f. report test design, test process, and test results
Subject Expectation 2 (State Goal 12)		**The student will understand the fundamental concepts, principles, and interconnections of life physical, and earth/space sciences.**
Essential Learning 1 (Learning Standard A)		Know and apply concepts that explain how things function, adapt, and change.
Critical Content	12.A.2a	a. observe changes over time
	12.A.2a	b. record information systematically for later analysis
	12.A.2a	c. observe and compare behaviors of an organism
Essential Learning 2 (Learning Standard B)		Know and apply concepts that describe how living things interact with each other and with their environment.
Critical Content	12.B.1b	a. compare and record observations about structures of an organism

Essential Learning 3 (Learning Standard C)		Know and apply concepts that describe properties of matter and energy and the interactions between them
Critical Content	12.C.2a	a. investigate different energy sources doing work
	12.C.2a	b. summarize how energy is converted into different forms
	12.C.2a	c. investigate how energy moves from place to place
	12.C.2b	d. observe and compare the interaction of water at different temperatures
	12.C.2b	e. observe and describe the properties of water in two states, solid and liquid
	12.C.2b	f. observe evaporation and condensation
	12.C.2b	g. compare rates of evaporation under different conditions
	12.C.2b	h. describe properties of solids, liquids, and gases
	12.C.2b	i. determine the need for standard units
	12.C.2b	j. measure and record the mass of objects and volume of fluid using appropriate tools
	12.C.2b	k. compare results to estimates
	12.C.2b	l. solve problems using understanding of standard units and measuring tools
Essential Learning 4 (Learning Standard D)		Know and apply concepts that describe force and motion and the principles that explain them
Critical Content	12.D.2a	a. observe and compare the behavior of pendulums
	12.D.2a	b. experiment to find out what variables affect the number of cycles a pendulum makes in a unit of time
	12.D.2a	c. observe and compare the behavior of a standard system to a modified system
	12.D.2a	d. conduct controlled experiments
	12.D.2a	e. relate the effect of variables to the outcomes of experiments
	12.D.2b	f. observe and compare water on a variety of surfaces
	12.D.2b	g. observe and compare rates of water flow
Essential Learning 5 (Learning Standard E)		Know and apply concepts that describe the features and processes of the Earth and its resources
Critical Content	12.E.2a	a. observe evaporation and condensation
		b. compare rates of evaporation under different conditions
Essential Learning 6 (Learning Standard F)		Know and apply concepts that explain the composition and structure of the universe and Earth's place in it
Subject Expectation 3 (State Goal 13)		**The student will understand the relationships among science, technology and society in historical and contemporary contexts**
Essential Learning 1 (Learning Standard A)		Know and apply the accepted practices of science
Critical Content	13.A.2a	a. demonstrate ways to avoid injury when conducting science activities
	13.A.2b	b. explain why similar investigations may not produce similar results
	13.A.2b	c. determine and justify the importance of an idea (what counts and what doesn't)
	13.A.2b	d. participate productively in scientific discussion
	13.A.2c	e. explain why keeping accurate and detailed records is important

Essential Learning 2 (Learning Standard C)		Know and apply concepts that describe the interaction between science, technology, and society.
Critical Content	13.B.2a	a. explain how scientific technology is used in science for a variety of purposes *such as* sample collection, storage and treatment; measurement; data collection, storage and retrieval; communication of information) • compare tools for measuring • collect and record data
	13.B.2b	b. describe the effects on society of scientific and technological innovations derived from plant and animals
	13.B.2c	c. identify and explain ways that science and technology influence the lives and careers of people
	13.B.2d	d. compare the relative effectiveness of reducing, reusing, and recycling in actual situations
	13.B.2e	e. identify and explain ways that technology changes ecosystems *such as* dams, highways, buildings, communication networks, power plants
	13.B.2f	f. analyze how specific personal and societal choices that humans make affect local, regional and global ecosystems *such as* lawn and garden care, mass transit, and hybrid engines

Elementary Science
Grade 5

Subject Expectation 1 (State Goal 11)		**The student will understand the processes of scientific inquiry and technological design to investigate questions, conduct experiments and solve problems.**
Essential Learning 1 (Learning Standard A)		Know and apply the concepts, principles, and processes of scientific inquiry
Critical Content	11.A.3a	a. formulate and revise hypotheses that can be tested by collecting data
	11.A.3b	b. conduct scientific experiments that control all but one variable
	11.A.3c	c. collect and record data accurately using consistent measuring and recording techniques and media
	11.A.2d	d. coordinate evidence to build and refine theories
	11.A.2d	e. produce reasonable explanations for or against models and theories
	11.A.3d	f. explain the existence of unexpected results in a data set
	11.A.3d	g. use data manipulation tools and quantitative *such as* mean, mode, simple equations, and representational methods *such as* simulations, image processing to analyze measurements
	11.A.3f	h. interpret and represent results of analysis to produce findings or use diagrams, figures, visualizations, and mathematical representations to convey complex ideas, patterns, or trends
	11.A.3g	i. report and display the process and results of a scientific investigation
Essential Learning 2 (Learning Standard B)		Know and apply concepts, principles, and processes of technological design
Critical Content	11.B.3a	a. identify an actual design problem and establish criteria for determining the success of a solution
	11.B.3b	b. sketch, propose, and compare design solutions to the problem
	11.B.3c	c. select the most appropriate design and build a prototype or simulation
	11.B.3d	d. test the prototype using available materials, instruments, and technology and record the data
	11.B.3e	e. evaluate the text results based on established criteria, note sources of error and recommend improvements
	11.B.3f	f. using available technology, report the relative success of the design based on the test results and criteria
Subject Expectation 2 (State Goal 12)		**The student will understand the fundamental concepts, principles, and interconnections of life physical, and earth/space sciences.**
Essential Learning 1 (Learning Standard A)		Know and apply concepts that explain how things function, adapt, and change.
Critical Content	12.A.3a	a. explain that living things need an energy source to become active and metabolize
	12.A.3a	b. explain that cells are basic unit of life and have basic needs
	12.A.3a	c. explain structures and functions of systems of plants and animals

Essential Learning 2 (Learning Standard B)		Know and apply concepts that describe how living things interact with each other and with their environment.
Critical Content	12.A.2a	a. Explain that process of photosynthesis
	12.B.2a	b. Discuss that foods combine to form different nutrients
Essential Learning 3 (Learning Standard C)		Know and apply concepts that describe properties of matter and energy and the interactions between them
Critical Content	12.C.3b	a. Use indicators to test for acids, vitamins, sugar, and fat in foods
	12.C.3b	b. connect the results of investigations and experiments to the amount of chemicals in food
Essential Learning 4 (Learning Standard D)		Know and apply concepts that describe force and motion and the principles that explain them
	12.D.2b	a. Develop physical and conceptual models
	12.D.2b	b. Design and build models and modify based on testing
Critical Content	12.D.3a	c. Observe and measure the effort to lift a load when load and effort remain constant and change
	12.D.3a	d. Compare the effort needed to lift a load with different classes of levers
	12.D.3a	e. Diagram relative positions and sizes of lever components in different systems
	12.D.3a	f. Observe and measure effort to a load with single-fixed and single-moveable pulley systems
	12.D.3a	g. Diagram and compare components of four kinds of pulley systems
Essential Learning 5 (Learning Standard E)		Know and apply concepts that describe the features and processes of the Earth and its resources
Critical Content	12.E.2a	a. Understand that a landform is a shape of the land
	12.E.2a	b. Observe that erosion wears away earth materials by water
	12.E.2a	c. Understand that erosion also occurs by wind and ice
	12.E.2a	d. Describe the process of deposition
	12.E.3b	e. Explain that flow of water is affected by barriers like deposition and erosion
	12.E.3b	f. Explain how slope and amount of water affect erosion and deposition
Essential Learning 6 (Learning Standard F)		Know and apply concepts that explain the composition and structure of the universe and Earth's place in it
This content is not taught in this grade.		
Subject Expectation 3 (State Goal 13)		**The student will understand the relationships among science, technology and society in historical and contemporary contexts**
Essential Learning 1 (Learning Standard A)		Know and apply the accepted practices of science
Critical Content	13.A.3a	a. Identify and reduce potential hazards in science activities such as ventilation, handling chemicals
	13.A.3c	b. explain what is similar and different about observational and experimental investigations
	13.A.2c	c. explain why keeping accurate and detailed records is important
	13.A.2b	d. determine and justify the importance of an idea (what counts and what doesn't)
	13.A.2b	e. participate productively in scientific discussion

Essential Learning 2 (Learning Standard C)		Know and apply concepts that describe the interaction between science, technology, and society.
Critical Content	13.B.2a	a. explain how scientific technology is used in science for a variety of purposes *such as* sample collection, storage and treatment; measurement; data collection, storage and retrieval; communication of information) • compare tools for measuring • collect and record data • examine how to care for animals
	13.B.2b	b. describe the effects on society of scientific and technological innovations derived from plant and animals *such as* antibiotics, steam engine, computer
	13.B.2c	c. identify and explain ways that science and technology influence the lives and careers of people
	13.B.2d	d. compare the relative effectiveness of reducing, reusing, and recycling in actual situations
	13.B.2e	e. identify and explain ways that technology changes ecosystems *such as* dams, highways, buildings, communication networks, power plants
	13.B.3f	f. analyze how specific personal and societal choices that humans make affect local, regional and global ecosystems