K-8 SCIENCE SCOPE & SEQUENCE

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inquiry skills

INQUIRY SKILLS – BASED ON NYS MST STANDARDS 1, 2, 6, and 7 (Kindergarten – Grade 8)

Science process skills should be based on a series of discoveries. Students learn most effectively when they have a central role in the discovery process. The MST Standards 1, 2, 6 and 7 (which are standards that are assessed on the New York State and New York City assessments) reflect a student-centered, problem-solving approach to science. Inquiry and Process Skills should be an integral part of each unit of study. The application of these skills allows students to investigate important issues in the world around them. These process skills should be incorporated into students' instruction as developmentally appropriate.

Classifying – arranging or distributing objects, events, or information representing objects or events in classes according to some method or system

Communicating – giving oral and written explanations or graphic representations of observations

Comparing and contrasting – identifying similarities and differences between or among objects, events, data, systems, etc.

Creating models – displaying information, using multisensory representations

Gathering and organizing data – collecting information about objects and events which illustrate a specific situation

Generalizing – drawing general conclusions from particulars

Identifying variables – recognizing the characteristics of objects or factors in events that are constant or change

Inferring – drawing a conclusion based on prior experiences

Interpreting data – analyzing data that have been obtained and organized by determining apparent patterns or relationships in the data

Making decisions – identifying alternatives and choosing a course of action from among the alternatives after basing the judgment for the selection on justifiable reasons

Manipulating materials – handling or treating materials and equipment safely, skillfully, and effectively

Measuring – making quantitative observations by comparing to a conventional or nonconventional standard

Observing – becoming aware of an object or event by using any of the senses (or extensions of the senses) to identify properties

Predicting – making a forecast of future events or conditions expected to exist

process skills

*PROCESS SKILLS – BASED ON NYS MST STANDARD FOUR (Kindergarten – Grade 4)**

Science is an ongoing process. Most often there is a question or problem that initiates an investigation searching for a possible solution or solutions. There is no single prescribed scientific method to govern an investigation. It is important that students practice the skills outlined below. For younger students, the emphasis is on discovery. For older students, the emphasis is on formulating and investigating their own questions.

***Note:** The use of "e.g." denotes examples that may be used for in-depth study. The terms "for example" and "such as" denote material that is testable. Items in parentheses denote further definition of the word(s) preceding the item and are testable.*

General Skills

i. Follow safety procedures in the classroom, laboratory, and field.

ii. Safely and accurately use the following tools:

- hand lens
- ruler (metric)
- balance
- gram weights
- spring scale
- thermometer (C°, F°)
- measuring cups
- graduated cylinder
- timepiece(s)

iii. Develop an appreciation of and respect for all learning environments (classroom, laboratory, field, etc.).

iv. Manipulate materials through teacher direction and free discovery.

v. Use information systems appropriately.

vi. Select appropriate standard and nonstandard measurement tools for measurement activities.

vii. Estimate, find, and communicate measurements, using standard and nonstandard units.

viii. Use and record appropriate units for measured or calculated values.

ix. Order and sequence objects and/or events.

x. Classify objects according to an established scheme.

xi. Generate a scheme for classification.

xiii. Observe, analyze, and report observations of objects and events.

xiv. Observe, identify, and communicate patterns.

xv. Observe, identify, and communicate cause-and-effect relationships.

xvi. Generate appropriate questions (teacher- and student-based) in response to observations, events, and other experiences.

xvii. Observe, collect, organize, and appropriately *graph* data, then accurately interpret results.

xviii. Collect and organize data, choosing the appropriate representation:

- journal entries
- *graphs*
- drawings/pictorial representations

xix. Make predictions based on prior experiences and/or information.

xx. Compare and contrast organisms/objects/events in the living and physical environments.

xxi. Identify and control variables/factors.

xxii. Plan, design, and implement a short-term and long-term investigation based on a student- or teacher-posed problem.

xxiii. Communicate procedures and conclusions through oral and written presentations.

* *In grades 5-8 the process skills are content-specific and are integrated into the units of study.*

Major Understandings Focused On Health

The following Major Understandings from the NYS Elementary Science Core Curriculum should be covered in grades K-4:

LE 5.3a Humans need a variety of healthy foods, exercise, and rest in order to grow and maintain good health.

LE 5.3b Good health habits include hand washing and personal cleanliness; avoiding harmful substances (including alcohol, tobacco, illicit drugs); eating a balanced diet; engaging in regular exercise.

kindergarten

UNIT 1 *(Previously Unit 2)* TREES THROUGH THE SEASONS

What are some changes we see in trees during the year?

Identify the basic needs of organisms to live and thrive: • Needs of plants to live and thrive (e.g., air, water, light) • Living things grow and change.	LE 1.1b LE 1.2a LE 4.2a LE 5.1a
Observe and compare the different structures that enable each plant to live and thrive: • Roots, leaves, stems, flowers, seeds	LE 3.1b
Observe adaptations of plants: • Plants respond to changes in the environment including seasonal changes such as: –Leaves falling in autumn and forming in springtime –Flowers blooming	LE 3.1c LE 5.2a

UNIT 2 *(Previously Unit 1)* EXPLORING PROPERTIES

How do we observe and describe objects?

Observe and describe physical properties of objects using all of the appropriate senses: • Size, shape, texture, weight, color, etc. • Determine whether objects are alike or different	PS 3.1b,c
Observe and describe physical properties of objects using appropriate tools: • Hot/cold (thermometer) • Weight (pan balance) • Measurement (nonstandard units) including bigger/smaller, more/less, capacity of liquids • Observations (hand lenses)	PS 3.1c,d,e,g
Observe, describe, and identify the properties of materials (e.g., wood, plastic, metal).	PS 3.1b,c,e
Sort or group objects according to their properties: • Texture, color, shape, etc. • Sink and float	PS 3.1f

UNIT 3 *(Same)* ANIMALS

What are animals?

Identify the basic needs of organisms to live and thrive: • Needs of animals to live and thrive (e.g., air, water, food, shelter) • Living things grow and change.	LE 1.1a LE 1.2a LE 4.1g LE 4.2a LE 5.1a
Observe and compare the different structures that enable each animal to live and thrive: • Wings, legs, fins, eyes, nose, ears, tongue, skin, claws, etc.	LE 3.1a
Make clear that nonliving things do not live and thrive.	LE 1.1c,d
Recognize that living things have offspring and that offspring closely resembles its parents: • Dogs /puppies, cats/kittens, cows/calves, ducks/ducklings, frogs/tadpoles	LE 2.2a
Observe physical animal characteristics that are influenced by changing environmental conditions such as: • Coat thickness in winter, rabbits changing fur color, shedding of fur	LE 5.2e
Observe that some animal behaviors are influenced by environmental conditions: • Nest building, hibernation, migration	LE 5.2f

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grade 1

UNIT 1 *(Previously Unit 3)* ANIMAL DIVERSITY

How are animals alike and different?

Identify, describe, and compare the physical structures of animals (e.g., body coverings, sensory organs, appendages, beaks).	LE 3.1a
Identify, in animals, the relationship between the physical structures and the functions of those structures (e.g., obtaining food and water, protection, movement, support).	LE 1.1a LE 3.1a
Compare and contrast the physical characteristics in animals.	LE 3.1a
Describe how physical traits help a species to survive (e.g., giraffe's neck, turtle's shell).	LE 3.1a LE 3.1c
Observe how animals grow and change in predictable ways: • Animals closely resemble their parents and other individuals in their species. • Some traits of living things have been inherited (e.g., number of limbs).	LE 2.2a LE 2.1a LE 2.2b
Describe animal life cycles and life spans (e.g., baby/adult, puppy to dog).	LE 4.1a,e,f,g

UNIT 2 *(Previously Unit 1)* PROPERTIES OF MATTER

What are some properties of solids, liquids, and gases?

Observe and describe the three states of matter: • Liquids take the shape of the containers they are in. • Air does not have a definite shape. • Solids have a definite shape.	PS 3.2a
Observe and describe how water evaporates when left in an open container (liquid water changes into gas as it moves into the air).	PS 2.1c PS 3.2c
Observe that the material(s) of which an object is made determines some specific properties of the object (sinking/floatation, solubility).	PS 3.1e
Predict, observe, and examine different substances to determine their ability to mix with water (e.g., oil, water; sugar, water; sand, water).	PS 3.1f PS 3.2c
Use tools such as hand lenses, rulers, thermometers, and balances to observe and measure the properties of materials.	PS 3.1e
Test objects to determine whether they sink or float: • Different materials (plastic, rubber, etc.) • Different shapes • Boat design	PS 3.1e,f
Observe, and describe the change of objects when placed in different environments. • Hot and cold • Lighting and shadows • Color • Wet and dry	PS 3.1c,d,e,g

UNIT 3 *(Previously Unit 2)* WEATHER AND SEASONS

What are some of the changes we notice between seasons?

Observe and describe weather conditions that occur during each season.	PS 1.1a
Observe, measure, record, and compare weather data throughout the year (e.g., cloud cover, cloud types, wind speed and direction, precipitation) by using thermometers, anemometers, wind vanes, and rain gauges.	PS 2.1a,b
Compare temperatures in different locations (e.g., inside, outside, in the sun, in the shade). Compare day and night temperatures.	PS 1.1a PS 3.1g
Illustrate and describe how the sun appears to move during the day.	PS 1.1a
Illustrate and describe how the moon changes appearance over time (phases of the moon).	
Describe the 24 hour day/night cycle(time).	PS 1.1b
Observe and record the changes in the sun's and other stars' position, and the moon's appearance relative to time of day and month, and note the pattern of this change.	PS 1.1c
Recognize that the sun's energy warms the air.	PS 4.2a

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grade 2

UNIT 1 *(Previously Unit 2)* EARTH MATERIALS

What materials make up the Earth?

Observe and describe the basic properties and components of soil: • Living components • Nonliving components	PS 2.1d
Investigate different types of soil according to: • Color • Texture • Materials • Capacity to retain water	PS 2.1d PS 3.1b,c,d PS 3.1e,f,g
Explore how erosion and deposition are the result of interactions between air, wind, water, and land.	PS 2.1d
Observe and describe the physical properties of rocks (size, shape, color, presence of fossils).	PS 3.1b,c PS 3.1d,e
Compare and sort rocks by size, color, luster, texture, patterns, hardness/softness.	PS 3.1f
Make clear that nonliving things can be human-created or naturally occurring.	LE 1.1d

UNIT 2 *(Previously Unit 1)* FORCES AND MOTION

What causes objects to move?

Observe and describe the position of an object relative to another object (over, under, on top of, next to).	PS 5.1a
Identify a force as push or a pull	PS 5.1
Demonstrate how the position or direction of an object can be changed by pushing or pulling (forces and motion): • Change the direction of objects by pushing and pulling using blocks, ramps, cars, and balls. –Inclined plane	PS 5.1b PS 5.1c
Identify gravity as a force that pulls objects down: • The balance scale • Balance and the center of gravity	PS 5.1c
Observe and describe how the force of gravity can affect objects through air, liquids, and solids.	PS 5.2a

UNIT 3 *(Same)* PLANT DIVERSITY

How are plants alike and different?

Identify and compare the physical structures of a variety of plant parts (seeds, leaves, stems, flowers, roots).	LE 3.1b
Observe and describe how plants grow and change in predictable ways: • Plants closely resemble their parents and other individuals of their species • Some traits of living things have been inherited (e.g., color of flower)	LE 2.1a LE 2.2 a,b
Observe plant life cycles and life spans.	LE 4.1a,b,c,d
Observe that plants reproduce from: • Seeds, bulbs and cuttings	LE 4.1 a,b,d
Describe the basic needs of plants: • Light, air, water, soil (nutrients)	LE 1.1b
Describe the basic life functions of plants: • Grow • Take in nutrients • Reproduce	LE 1.1b LE 1.2a LE 4.1b LE 5.1a
Observe that plants respond to changes in their environment (e.g., the leaves of some green plants change position as the direction of light changes; the parts of some plants undergo seasonal changes that enable the plant to grow, seeds to germinate, and leaves to form and grow).	LE 5.2a

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grade 3

UNIT 1 MATTER

What are some of the properties of matter?

Measure, compare and record physical properties of objects using: — PS 3.1 b,c; PS 3.1d,e

- Standard (metric) and nonstandard units
- Appropriate tools (e.g., rulers, thermometers, pan balances, spring scales, graduated cylinders, beakers)

Describe and compare the physical properties of matter (size, shape, mass/weight, volume, flexibility, luster, color, texture, hardness, odor, etc.). — PS 3.1b,c

UNIT 2 ENERGY

What are some ways that energy can be changed from one form to another?

Observe, identify, and describe a variety of forms of energy: — PS 4.1a

- Sound
- Heat
- Chemical
- Mechanical
- Electricity

Identify the evidence for energy transformations and how humans use these energy transformations: — PS 4.2a,b

- Heat to light, chemical to electrical, electrical to sound, etc.

Observe and describe how heat is conducted and can be transferred from one place to another. — PS 4.1b,c,d

Observe and describe different ways in which heat can be released: — PS 4.1f

- Burning, rubbing (friction), or combining one substance with another.

Interactions of matter and energy (e.g., electricity lighting a bulb, dark colors absorbing light, etc.). — PS 4.1d

Sound energy: — PS 4.1a,b,c; PS 4.1d,g

- Pitch (frequency)
- Vibrations
- Volume
- How sound travels through solids, liquids, gases
- Noise pollution

UNIT 3 SIMPLE MACHINES

How do simple machines help us move objects?

Demonstrate how mechanical energy may cause change in motion through the application of force or the use of simple machines such as: — PS 5.1f

- Levers, pulleys, inclined planes
- Wheel and axle

Observe and describe how the amount of change in the motion of an object is affected by friction — PS 5.1d

Observe and describe how the position or direction of motion of an object can be changed by pushing or pulling. — PS 5.1b

Observe how the force of gravity pulls objects toward the center of the Earth. — PS 5.1c

UNIT 4 PLANT AND ANIMAL ADAPTATIONS

How are plants and animals well-suited to live in their environments?

Describe how all living things grow, take in nutrients, breathe, reproduce and eliminate waste. — LE 5.1a,b

Describe how plants must be adapted to their environment in order to survive.: — LE 3.1b,c; LE 5.2a; LE 6.1f

- Structures and their functions (e.g., roots, leaves, flowers, etc.)
- Adaptations of these structures may include variations in size, shape, thickness, color, smell, and texture.
- Plants change as the seasons change
- Seed dispersal

Describe how animals must be adapted to their environment in order to survive: — LE 3.1a,c; LE 5.2b,d,e,f; LE 6.1f

- Structures and their functions (e.g., wings, legs, fins, scales, feathers, fur, etc.)
- Understand that animals respond to change in the environment (e.g., heart rate, eye blinking, shivering)
- Animals change as seasons change
  - Hibernation
  - Migration (i.e., moving from place to place to meet needs) including human

Recognize that traits of living things are both: — LE 2.1a,b

- Inherited (color of flowers, eye color).
- Learned/acquired (riding a bicycle, having scars)

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grade 4

UNIT 1
ANIMALS AND PLANTS IN THEIR ENVIRONMENT

What roles do plants and animals play in their environments?

Classify populations of organisms as producers, consumers, or decomposers by the role they serve in the ecosystem (food chains and food web).	**LE** 6.1a-d
Explore how plants manufacture food by utilizing air, water, and energy from the sun.	LE 6.2a,b
Understand that food supplies energy and materials necessary for growth and repair.	LE 4.2b
Identify populations within a community that are in competition with one another for resources.	LE 6.1e
Recognize that individual variations within a species may cause certain individuals to have an advantage in surviving and reproducing.	LE 3.2a,b
Describe how the health, growth, and development of organisms are affected by environmental conditions such as availability of food, water, air, space, shelter, heat, and sunlight.	LE 5.2g
Understand that their senses help animals survive.	LE 5.2c
Observe that when the environment changes, some plants and animals survive and reproduce, while others die or move to new locations.	LE 6.1f
Describe the way that humans: • Depend on their natural and constructed environment. • Have changed their environment over time.	LE 7.1a,b
Identify examples where human activity has had a beneficial or harmful effect on other organisms (e.g., deforestation).	LE 7.1b,c

UNIT 2
ELECTRICITY AND MAGNETISM

What are the properties of electricity and magnetism?

Observe, describe, and investigate the evidence of energy transfer in electrical circuits: • Simple circuits • Open and closed circuits • Switches	PS 4.1a,b PS 4.1c,d,e
Construct and diagram an electrical circuit.	PS 4.1e
Identify conductors and insulators in an electrical circuit.	PS 4.1c
Compare the electrical and magnetic properties of different materials.	PS 3.1c,e,f
Investigate properties of magnets, including: • Magnets attract or repel certain objects • Magnets attract or repel each other • Magnetic forces can operate on objects across distances and through materials • A magnetic field is produced	PS5.1e PS5.2a,b
Explore the interaction of electricity and magnetism to create an electromagnet.	PS 4.1d
Describe how electricity can be helpful or harmful to people (safety).	PS 4.1g

UNIT 3
PROPERTIES OF WATER

What makes water so special?

Observe, describe, and explore the physical properties of water: • Color, texture, odor, sound • Changes in shape • Changes in the amount of space occupied (compare using containers of different shapes and sizes). • Volume, mass (weight)	PS 3.1a,b PS 3.1c,d,e
Explore how different factors affect evaporation.	PS 2.1c PS 3.2a,b,c LE 6.2c
Describe the Water Cycle.	PS 2.1c LE 6.2c
Test objects to determine whether they sink or float: • Different materials (plastic, rubber etc.) • Different shapes • Boat design	PS 3.1e,f
Predict, observe, and examine different substances to determine their ability to mix with water (e.g., oil, water; sugar, water; wooden block, water).	PS 3.1e,f PS 3.2c
Examine and describe the transformation of matter from one state to another, e.g., solid water (ice) to liquid (water) to gas (water vapor).	PS 3.2 a,b
Water is recycled by natural processes on earth. • Precipitation • Condensation • Evaporation	PS 3.2 a,b
Predict and investigate the effect of heat energy on objects and materials. (e.g., change in temperature, melting, evaporation)	PS 2.1c PS 3.2b,c PS 4.1d
Describe the physical changes of materials.	PS 3.2c

UNIT 4
INTERACTIONS OF AIR, WATER, AND LAND

How do natural events affect our world?

Observe, investigate, and record examples of physical and chemical weathering.	PS 2.1 d
Describe how erosional processes (e.g., action of gravity, wind, and water) cause surface changes to the land.	PS 2.1d
Investigate, measure, and observe the deposition of earth materials.	PS 2.1d
Describe and illustrate the natural processes by which water is recycled on earth (e.g., ground water, runoff).	PS 2.1c
Investigate the negative and positive impact of extreme natural events on living things: • Earthquakes • Volcanoes • Hurricanes • Tornadoes • Floods • Fires	PS 2.1 e

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grade 5

UNIT 1
THE NATURE OF SCIENCE

How do scientists gather and share information?

Intermediate Level Major Understandings

Formulate questions of scientific inquiry with the aid of references appropriate for guiding the search for explanations of everyday observations.	S1.1a,b,c
Identify **questions and formulate hypothesis**; design and conduct scientific investigations to answer those questions.	S1.2a S2.1b,c S2.2b,c,d,e S2.3b,c
Employ tools to gather, analyze, and interpret data.	S2.1d S3.1a,b
Use mathematics in scientific inquiry.	M3.1a
Use data to construct reasonable explanations. **Evaluate your hypothesis in light of the data.**	S3.2a,b,c
Develop and communicate explanations using evidence.	S1.3 S3.2d,e
Identify dependent and independent variables.	M1.1a S2.2d

UNIT 2
EARTH SCIENCE

What are the processes that help shape the land?

Intermediate Level Major Understandings

Differentiate between rocks and minerals.	PS 2.1e
Classify rocks as sedimentary, igneous, or metamorphic.	PS 2.2g
Investigate, record, and explain how rocks and soil form.	PS 2.1g,h PS 2.2g,h
Observe, compare, and describe **the topography of the earth's surface**.	**PS 2.2a,f**
Investigate, record, and explain the variables that affect erosion and deposition.	PS 2.1g,i
Investigate and explain how weathering leads to the formation of sediment.	PS 2.1h
Identify events (earthquakes, volcanic eruptions, etc.) that cause earth movements.	PS 2.2a,c,f
Develop and construct models of landforms.	S1.2b

UNIT 3
FOOD AND NUTRITION

How does nutrition and exercise affect our health?

Elementary Level Major Understandings

Recognize that:

• Humans need a variety of healthy foods, exercise, and rest in order to grow and maintain good health.	*(omitted LE 5.2a,b, e,f)* **LE 5.3a**
• Good health habits include hand washing and personal cleanliness; avoiding harmful substances (including alcohol, tobacco, illicit drugs); eating a balanced diet; engaging in regular exercise.	*(omitted LE 5.2e,f)* **LE 5.3b**
• The health, growth, and development of organisms are affected by environmental conditions such as the availability of food, air, water, space, shelter, heat, and sunlight.	*(omitted LE 5.2e,f)* **LE 5.2g**
• Food supplies the energy and materials necessary for growth and repair.	*(omitted PS 3.1c,d, e,g)* **LE 4.2b**

UNIT 4
EXPLORING ECOSYSTEMS

How are plants and animals in an ecosystem connected?

Intermediate Level Major Understandings

Observe, identify, and record the components of a forest ecosystem.	LE 7.1a
Observe and describe how plants use air, water, and energy from the sun to produce their own food.	LE 5.1d LE 6.2a
Describe how food supplies the energy and materials necessary for growth and repair of living organisms.	LE 5.1c LE 5.2a
Classify populations of organisms as producers, consumers, or decomposers by the role they serve in the ecosystem (food chains and food web).	LE 5.1d,e LE 6.1 a,b
Identify populations within a community that are in competition with one another for resources.	LE 3.2a *(omitted LE 7.1b)*
Describe the way humans: • Depend on their natural and constructed environment. • Have changed their environment over time.	*(omitted LE 7.1a,b)* LE 7.2b,c LE 7.2d
Identify examples where human activity has had a beneficial or harmful effect on other organisms (e.g., deforestation).	LE 7.2b,c LE 7.2d

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grade 5

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UNIT 1 THE NATURE OF SCIENCE	UNIT 2 EARTH SCIENCE	UNIT 3 FOOD AND NUTRITION	UNIT 4 EXPLORING ECOSYSTEMS
How do scientists gather and share information? **Intermediate Level Major Understandings**	***What are the processes that help shape the land?*** **Intermediate Level Major Understandings**	***How does nutrition and exercise affect our health?*** **Elementary Level Major Understandings**	***How are plants and animals in an ecosystem connected?*** **Intermediate Level Major Understandings**
General Skills (from NYS Core Curriculum) – Follow safety procedures in the classroom and laboratory. – Safely and accurately use the following measurement tools: - metric ruler - balance - stopwatch - graduated cylinder - thermometer – Use appropriate units for measured or calculated values. – Recognize and analyze patterns and trends. – Sequence events. – Identify cause-and-effect relationships.	**General Skills (from NYS Core Curriculum)** – Follow safety procedures in the classroom and laboratory. – Safely and accurately use the following measurement tools: - metric ruler - balance - graduated cylinder – Use appropriate units for measured or calculated values. – Recognize and analyze patterns and trends. – Classify objects according to an established scheme and a student-generated scheme. – Sequence events. – Identify cause-and-effect relationships. (continued)	**General Skills (from NYS Core Curriculum)** – Follow safety procedures in the classroom and laboratory. – Safely and accurately use the following measurement tools: - metric ruler - balance - stopwatch - graduated cylinder - thermometer – Use appropriate units for measured or calculated values. – Classify objects according to an established scheme. – Order and sequence objects and/or events. – Identify cause-and-effect relationships. (continued)	**General Skills (from NYS Core Curriculum)** – Follow safety procedures in the classroom and laboratory. – Safely and accurately use the following measurement tools: - metric ruler - balance - graduated cylinder - thermometer – Use appropriate units for measured or calculated values. – Recognize and analyze patterns and trends. – Classify objects according to an established scheme and a student-generated scheme. – Identify cause-and-effect relationships. – Use indicators and interpret results. (continued)

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grade 5 CONTINUED

UNIT 1 THE NATURE OF SCIENCE	UNIT 2 EARTH SCIENCE	UNIT 3 FOOD AND NUTRITION	UNIT 4 EXPLORING ECOSYSTEMS
How do scientists gather and share information? **Intermediate Level Major Understandings**	***What are the processes that help shape the land?*** **Intermediate Level Major Understandings**	***How does nutrition and exercise affect our health?*** **Elementary Level Major Understandings**	***How are plants and animals in an ecosystem connected?*** **Intermediate Level Major Understandings**
	Physical Setting Skills **(from NYS Core Curriculum)** – Using identification tests and a flow chart, identify mineral samples. – Use a diagram of the rock cycle to determine geological processes that led to the formation of a specific rock type.	*[Deleted: Living Environment Skills (from NYS Elementary Core Curriculum)]*	**Living Environment Skills** **(from NYS Core Curriculum)** – Classify living things according to a student-generated scheme and an established scheme. – Interpret and/or illustrate the energy flow in a food chain, energy pyramid, or food web.

The right hand column in each unit represents the Major Understandings taken from the New York State Intermediate Level Science Core Curriculum (those in Unit 3 are taken from the New York State Elementary Level Science Core Curriculum), available at www.emsc.nysed.gov/ciai/mst/pub/intersci.pdf. PS = Physical Setting – Standard 4, LE = Living Environment – Standard 4. Science process skills should be based on a series of discoveries. Students learn most effectively when they have a central role in the discovery process. To that end, MST Standards 1, 2, 6 and 7 incorporate in the science core curriculum a student-centered, problem-solving approach to science. Inquiry and Process Skills should be an integral part of each unit of study. For Major Understandings in science related to health, please see page ii.

grade 6

UNIT 1 SIMPLE AND COMPLEX MACHINES

How does energy play a role in our lives? How do machines impact our lives?

• Potential and kinetic energy	PS 4.1e
• Mechanical energy	PS 4.1d PS 5.2c
• Machines can affect the magnitude or direction of a force required to do work, or the distance over which that force is applied.	PS 5.2f
• Simple machines include the lever, the pulley, the wheel and axle, and the inclined plane.	PS 5.2g
• Complex machines	PS 5.2g
• Transformation of energy within simple and complex machines	PS 4.1c PS 5.2c
• Principle of the conservation of energy	PS 4.5a,b PS 5.2c
• Friction and machines	PS 5.2d,e

UNIT 2 WEATHER

How do matter and energy interact to produce weather patterns?

Properties of Matter

• Matter is anything that takes up space and has mass.	PS 3.1a
• Solids, liquids, and gases	PS 3.1a,c-f PS 4.2c
• Relationship between phases of matter and particle motion	PS 3.1c,f PS 4.2c,d
• Density	PS 3.1a,h

Heating and Cooling Events

• Principle of the conservation of energy	PS 4.5a,b
• Transfer of heat: radiation, convection, and conduction	PS 4.1a PS 4.2a,b
• Heat and its relationship to phase changes	PS 3.1c PS 3.2a PS 4.2c,d
• Expansion and contraction	PS 4.2d

UNIT 3 DIVERSITY OF LIFE

How does the transfer of matter and energy through biological communities support diversity of living things?

Kingdoms of Life

• What makes something "alive"?	LE 1.1a
• The cell is a basic unit of structure and function of living things.	LE 1.1a-c
• Unicellular vs. multicellular organisms	LE 1.1d-g
• Biological classification systems	LE 1.1h

Food Chains and Food Webs

deleted • Principle of the conservation of energy	*deleted* *PS 4.1d* *PS 4.5a,b*
• Flow of energy and matter through food chains and food webs	LE 5.1c LE 5.2a LE 6.1a-c
• Methods for obtaining nutrients	LE 5.1d,e *deleted* *LE 5.2b*
• Role of producers	LE 6.2a-c

UNIT 4 INTERDEPENDENCE

How is interdependence essential in maintaining life on Earth?

Climate and Biomes

• Climatic regions	PS 2.2j
• Biomes: Tundra, Tropical Rain Forest, Temperate Forests, Grasslands, Desert	LE 7.1a ICT 1.2, 1.4,4.1
• Seasonal variations	PS 1.1i
• Effect of elevation	PS 2.1b
• Global Warming: natural cycles vs. human impact	LE 7.2d PS 2.2r ICT 1.4, 2.1-2.3, 4.1, 5.1, 5.2, 6.1, 6.2, IPS 1.3

Ecosystems and Interdependence

• Populations and definition of species	LE 1.1h LE 7.1a
• Communities	LE 7.1a
• Ecosystems (including basic abiotic factors such as water, nitrogen, CO_2, and oxygen)	LE 7.1a LE 7.2a,b ICT 1.2

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grade 6

UNIT 1 SIMPLE AND COMPLEX MACHINES

How does energy play a role in our lives? How do machines impact our lives?

General Skills (from NYS Core Curriculum)

– Follow safety procedures in the classroom and laboratory.

– Safely and accurately use the following measurement tools:
- metric ruler
- spring scale.

– Use appropriate units for measured or calculated values.

– Recognize and analyze patterns and trends.

– Sequence events.

– Identify cause-and-effect relationships.

UNIT 2 WEATHER

How do matter and energy interact to produce weather patterns?

Weather

- Weather is the result of complex interactions of the atmosphere, hydrosphere, and lithosphere; all weather is caused by the unequal heating of the earth's surface. — PS 2.1a,c,d,j; PS 2.2i,k,r
- Light energy vs. heat energy — PS 4.1a,c,d; PS 4.4a,b
- Hydrosphere/atmosphere interactions: Water cycle, Precipitation — PS 2.1j
- Weather factors: Pressure, relative humidity, temperature, wind — PS 2.2l
- Air masses and fronts — PS 2.2l-p
- Extreme weather events: hurricanes, tornadoes, blizzards, drought — PS 2.2q

General Skills (from NYS Core Curriculum)

– Follow safety procedures in the classroom and laboratory.

UNIT 3 DIVERSITY OF LIFE

How does the transfer of matter and energy through biological communities support diversity of living things?

- Role(s) of consumers: idea of respiration/recycling; herbivores/carnivores/omnivores. — LE 5.1d,e; LE 5.2b,c-e
- The role of decomposers. — LE 5.1e

General Skills (from NYS Core Curriculum)

– Follow safety procedures in the classroom and laboratory.

– Recognize and analyze patterns and trends.

– Develop and use a dichotomous key.

– Sequence events.

– Identify cause-and-effect relationships.

Living Environment Skills (from NYS Core Curriculum)

– Manipulate a compound microscope to view microscopic objects.

– Determine the size of a microscopic object using a compound microscope.

UNIT 4 INTERDEPENDENCE

How is interdependence essential in maintaining life on Earth?

- Factors affecting the population growth of organisms — Predator/prey relationships — LE 7.1b
- Relationships among organisms: beneficial and harmful — LE 3.2a; LE 7.1c,d; LE 7.2c
- Effects of environmental changes on humans and other populations — LE 7.2a-d; LE 7.1e; ICT 5.2

Adaptations for Survival

- Thermoregulation in plants and animals — LE 1.2e; LE 5.1a,b,f; *deleted 5.1g*
- Locomotion — **add LE 5.1g**

General Skills (from NYS Core Curriculum)

– Follow safety procedures in the classroom and laboratory.

– Safely and accurately use the following measurement tool:
- thermometer.

– Use appropriate units for measured or calculated values.

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grade 6

UNIT 1 SIMPLE AND COMPLEX MACHINES	UNIT 2 WEATHER	UNIT 3 DIVERSITY OF LIFE	UNIT 4 INTERDEPENDENCE
How does energy play a role in our lives? How do machines impact our lives?	***How do matter and energy interact to produce weather patterns?***	***How does the transfer of matter and energy through biological communities support diversity of living things?***	***How is interdependence essential in maintaining life on Earth?***
	– Safely and accurately use the following measurement tools: - metric ruler - balance - graduated cylinder - thermometer. – Use appropriate units for measured or calculated values. – Recognize and analyze patterns and trends. – Classify objects according to an established scheme and a student-generated scheme. – Sequence events. – Identify cause-and-effect relationships. **Physical Setting Skills (from NYS Core Curriculum)** – Given the latitude and longitude of a location, indicate its position on a map and determine the latitude and longitude of a given location on a map. – Generate and interpret field maps including topographic and weather maps. – Predict the characteristics of an air mass based on the origin of the air mass. – Measure weather variables such as wind speed and direction, relative humidity, barometric pressure, etc. – Determine the density of liquids, and regular- and irregular-shaped solids.	– Classify living things according to a student-generated scheme and an established scheme. – Interpret and/or illustrate the energy flow in a food chain, energy pyramid, or food web. – Identify structure and function relationships in organisms.	– Recognize and analyze patterns and trends. – Identify cause-and-effect relationships. – Use indicators and interpret results. **Living Environment Skills (from NYS Core Curriculum)** – Classify living things according to a student-generated scheme and an established scheme. – Identify structure and function relationships in organisms. **Physical Setting Skills (from NYS Core Curriculum)** – Given the latitude and longitude of a location, indicate its position on a map and determine the latitude and longitude of a given location on a map. – Use a magnetic compass to find cardinal directions. – Measure the angular elevation of an object, using appropriate instruments. – Generate and interpret field maps including topographic and weather maps.

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grade 7

CYCLES OF MATTER AND ENERGY; FORM AND FUNCTION; CLASSIFICATION

UNIT 1 GEOLOGY

How do we as scientists gather and interpret evidence that Earth is continually changing?

Earth as a System

• Layers and composition: Lithosphere, Hydrosphere, Atmosphere, Biosphere	PS 2.1a,c,d PS 2.2b

Rocks and Minerals

• Rock cycle	PS 2.2h
• Classification of rocks: Sedimentary, metamorphic, and igneous rocks	PS 2.2g
• Properties of minerals including density	PS 2.1e
• Erosion and weathering	PS 2.1g-i

Fossils and Earth's History

• Where fossils are found	PS 2.1f
• Dating of rocks: Absolute and relative age	LE 3.2c PS 2.1f
• The importance of the fossil record	LE 3.2b,c PS 2.1f PS 2.2d

UNIT 2 INTERACTIONS BETWEEN MATTER AND ENERGY

How do the properties and interactions of matter and energy explain physical and chemical change?

Properties of Sound and Light

• Electromagnetic energy	PS 4.1d PS 4.4a
• Wave behavior	
–Light reflection and refraction	PS 4.4b
–Vibrations and sound waves	PS 4.4c

Properties of Matter

• The properties of materials, such as: density, conductivity, magnetic materials, and solubility	PS 3.1a, b,**g**,h **added g** PS 4.4f,g
• Elements and compounds	PS 3.3e,f
• Atoms and molecules	PS 3.3a-d
• The Periodic Table as a way of organizing the elements	PS 3.3g

UNIT 3 DYNAMIC EQUILIBRIUM: THE HUMAN ANIMAL

How do human body systems function to maintain homeostasis?

Levels of Organization

• Cells – structure and function	LE 1.1a-d
• Tissues; organs; systems; organism	LE 1.1e,g LE 1.2a,b

The Human Body

• Maintaining homeostasis: The human body systems	LE 5.1b **add LE 5.2f**
–Digestive	LE 1.2c
–Respiratory	LE 1.2d
–Circulatory	LE 1.2f
–Excretory	LE 1.2e
–Skeletal and Muscular	LE 1.2g
• Obtaining energy	LE 5.1c,e LE 5.2a,d
• Obtaining nutrients	LE 5.1d LE 5.2a,b LE 5.2e
• Regulation of the internal environment	LE 5.1f
• Metabolism	LE 5.2c
• Responding to the external environment (Nervous system)	LE 1.2h LE 5.1g

UNIT 4 DYNAMIC EQUILIBRIUM: OTHER ORGANISMS

How is homeostasis maintained in other organisms?

Other Animals

• Animal structures and systems	LE 1.1g LE 5.1a,b
• Maintaining homeostasis	LE 5.1f LE 5.2e
• Obtaining energy	LE 5.1c,e LE 5.2a
• Obtaining nutrients	LE 5.1d LE 5.2a,b
• Regulation of the internal environment	LE 5.1f
• Metabolism	LE 5.2c
• Responding to the external environment	LE 5.1g

Plants

• Plant structures and systems	LE 1.1f LE 5.1a,b
• Maintaining homeostasis	LE 5.1f LE 5.2e
• Obtaining energy	LE 5.1c, LE 5.2a LE 6.2a

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grade 7

CYCLES OF MATTER AND ENERGY; FORM AND FUNCTION; CLASSIFICATION

UNIT 1 GEOLOGY

How do we as scientists gather and interpret evidence that Earth is continually changing?

Plate Tectonics

- Theory of plate movement and evidence supporting the theory — PS 2.2c-e
- Convection currents — PS 2.2e, PS 4.2b
- Buoyancy (relative density) — PS 3.1i
- Sea-floor spreading — PS 2.2a,f
- Earthquakes: faulting and folding of the earth's crust — PS 2.2a,c,f
- Volcanoes — PS 2.2a,f
- Mountain building — PS 2.2a,f
- Topography of Earth's surface — PS 2.2a,f

General Skills (from NYS Core Curriculum)

– Follow safety procedures in the classroom and laboratory.

– Safely and accurately use the following measurement tools:
- metric ruler
- balance
- graduated cylinder.

UNIT 2 INTERACTIONS BETWEEN MATTER AND ENERGY

How do the properties and interactions of matter and energy explain physical and chemical change?

Physical and Chemical Changes

- Characteristics of physical changes: — PS 3.2a
  - –Review of phase change/ states of matter — PS 3.1c-f
  - –Mixtures and solutions — PS 3.1g, PS 3.2b
  - –Temperature and its effect on solubility — PS 3.1b, PS 4.2e
- Characteristics of chemical changes — PS 3.2c,d

Understanding Chemical Reactions: *deleted Photosynthesis and Respiration*

deleted — *deleted LE 1.2d*

deleted — *LE 5.1c,d*

- *Law of Conservation of Mass* — *LE 5.2a, LE 6.2a,b, PS 3.2e*
- Energy changes in chemical reactions — PS 4.3a
- Law of Conservation of Energy — PS 4.5a,b

UNIT 3 DYNAMIC EQUILIBRIUM: THE HUMAN ANIMAL

How do human body systems function to maintain homeostasis?

General Skills (from NYS Core Curriculum)

– Follow safety procedures in the classroom and laboratory.

– Safely and accurately use the following measurement tools:
- metric ruler
- stopwatch (*for pulse rate*)
- thermometer

– Use appropriate units for measured or calculated values.

– Sequence events.

– Identify cause-and-effect relationships.

Living Environment Skills (from NYS Core Curriculum)

– Manipulate a compound microscope to view microscopic objects (*look at different types of cells and tissues*).

– Determine the size of a microscopic object using a compound microscope.

UNIT 4 DYNAMIC EQUILIBRIUM: OTHER ORGANISMS

How is homeostasis maintained in other organisms?

- Obtaining nutrients — LE 5.1d, LE 5.2a,b
- Regulation of the internal environment — LE 5.1f
- Metabolism — LE 5.2c
- Responding to the external environment — LE 5.1g

One-celled Organisms

- Unicellular vs. multicellular organisms — LE 1.1d,g
- Maintaining homeostasis — LE 5.1f, LE 5.2e
- Obtaining energy — LE 5.1c,e
- Obtaining nutrients — LE 5.1d, LE 5.2a,b
- Regulation of the internal environment — LE 5.1f
- Metabolism — LE 5.2c
- Responding to the external environment — LE 5.1g

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grade 7

CYCLES OF MATTER AND ENERGY; FORM AND FUNCTION; CLASSIFICATION

UNIT 1 GEOLOGY	UNIT 2 INTERACTIONS BETWEEN MATTER AND ENERGY	UNIT 3 DYNAMIC EQUILIBRIUM: THE HUMAN ANIMAL	UNIT 4 DYNAMIC EQUILIBRIUM: OTHER ORGANISMS
How do we as scientists gather and interpret evidence that Earth is continually changing?	***How do the properties and interactions of matter and energy explain physical and chemical change?***	***How do human body systems function to maintain homeostasis?***	***How is homeostasis maintained in other organisms?***
– Use appropriate units for measured or calculated values. – Recognize and analyze patterns and trends. – Classify objects according to an established scheme and a student-generated scheme. – Sequence events. – Use indicators and interpret results. **Living Environment Skills (from NYS Core Curriculum) (if using microscopes to look at crystals)** – Manipulate a compound microscope to view microscopic objects. – Determine the size of a microscopic object, using a compound microscope. **Physical Setting Skills (from NYS Core Curriculum)** – Given the latitude and longitude of a location, indicate its position on a map and determine the latitude and longitude of a given location on a map.	• Interactions among atoms and/or molecules result in chemical reactions. PS 3.3d *deleted PHOTOSYNTHESIS and RESPIRATION)* *deleted* • *as context for chemical change as well as transformation of energy: light; chemical; heat* **General Skills (from NYS Core Curriculum)** – Follow safety procedures in the classroom and laboratory. – Safely and accurately use the following measurement tools: - balance - graduated cylinder - thermometer - spring scale - voltmeter. – Use appropriate units for measured or calculated values.	– Interpret and/or illustrate the energy flow in a food chain, energy pyramid, or food web (*with regard to nutrients and calories*). – Identify pulse points and pulse rates. – Identify structure and function relationships in organisms.	**General Skills (from NYS Core Curriculum)** – Follow safety procedures in the classroom and laboratory. – Safely and accurately use the following measurement tool: - metric ruler. – Use appropriate units for measured or calculated values. – Recognize and analyze patterns and trends. – Classify objects according to an established scheme and a student-generated scheme. – Develop and use a dichotomous key. – Sequence events. – Identify cause-and-effect relationships.

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grade 7

CYCLES OF MATTER AND ENERGY; FORM AND FUNCTION; CLASSIFICATION

UNIT 1 GEOLOGY	UNIT 2 INTERACTIONS BETWEEN MATTER AND ENERGY	UNIT 3 DYNAMIC EQUILIBRIUM: THE HUMAN ANIMAL	UNIT 4 DYNAMIC EQUILIBRIUM: OTHER ORGANISMS
How do we as scientists gather and interpret evidence that Earth is continually changing?	***How do the properties and interactions of matter and energy explain physical and chemical change?***	***How do human body systems function to maintain homeostasis?***	***How is homeostasis maintained in other organisms?***
– Using identification tests and a flow chart, identify mineral samples. – Use a diagram of the rock cycle to determine geological processes that led to the formation of a specific rock type. – Plot the location of recent earthquake and volcanic activity on a map and identify patterns of distribution. – Use a magnetic compass to find cardinal directions. – Measure the angular elevation of an object, using appropriate instruments. – Generate and interpret field maps including topographic and weather maps. – Determine the density of liquids, and regular- and irregular-shaped solids. – Determine the volume of a regular- and an irregular-shaped solid, using water displacement. – Determine the identity of an unknown element, using physical and chemical properties.	– Recognize and analyze patterns and trends. – Classify objects according to an established scheme and a student-generated scheme. – Sequence events. – Use indicators and interpret results. **Physical Setting Skills (from NYS Core Curriculum)** – Determine the density of liquids, and regular- and irregular-shaped solids. – Using the periodic table, identify an element as a metal, nonmetal, or noble gas. – Determine the identity of an unknown element, using physical and chemical properties. – Using appropriate resources, separate the parts of a mixture. – Determine the electrical conductivity of a material, using a simple circuit.		**Living Environment Skills (from NYS Core Curriculum)** – Manipulate a compound microscope to view microscopic objects. – Determine the size of a microscopic object using a compound microscope. – Prepare a wet mount slide. – Use appropriate staining techniques. – Classify living things according to a student-generated scheme and an established scheme. – Identify structure and function relationships in organisms.

The right hand column in each unit represents the Major Understandings taken from the New York State Intermediate Level Science Core Curriculum, available at www.emsc.nysed.gov/ciai/mst/pub/intersci.pdf.

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grade 8

UNIT 1
REPRODUCTION, HEREDITY, AND EVOLUTION
(see changes below)

How does life on Earth continue and adapt in response to environmental change?

Reproductive Patterns and the Continuity of Life

- Asexual Reproduction, e.g., Binary fission in unicellular organisms, budding, and vegetative propagation. — LE 2.1d, LE 4.1a,b
- Sexual Reproduction – formation of gametes — LE 2.1e, LE 4.1a,c,d, LE 4.2b, LE 4.4c
- Compare and contrast results, contexts, advantages and disadvantages of each method. — LE 4.1a

Patterns of Development and the Continuity of Life

- Patterns of development in plants — LE 4.3a,**b**,c,e,f **added b**
- Patterns of development in animals — LE 4.3a,**b**,c,d,f **added b**
- Cell division-growth, maintenance, and repair — LE 4.4a,b
  - Cancer is the result of abnormal cell division — LE 4.4d

UNIT 2 *(previously Unit 4 – no other changes)*
FORCES AND MOTION ON EARTH

How do we apply the laws of motion to explain the movement of objects on Earth?

Motion and Newton's Laws

- Patterns of motion, frame of reference and position, direction, and speed. — PS 5.1a,b
- Newton's First Law of Motion: Inertia — PS 5.1c
- Newton's Second Law: F = ma (*conceptual understanding as opposed to teaching the formula*) — PS 5.1d
- Newton's Third Law: For every action there is an equal and opposite reaction; Force as an interaction — PS 5.1e, PS 5.2b

UNIT 3
EARTH, SUN, MOON SYSTEM
(no changes)

What roles do forces play in the patterns and stability of the Solar System?

Seasons and Cycles: Relationships Among the Sun, Earth, and Moon

- Day: rotation — PS 1.1e,h
- Year: revolution — PS 1.1e,h
- Seasons: tilt of Earth's axis of rotation — PS 1.1i
- Phases of the Moon — PS 1.1g
- Eclipses — PS 1.1e
- Tides — PS 1.1e

Solar System

- Classification of celestial objects: stars including the sun; planets; comets; moons; and asteroids. — PS 1.1a-c,j
- Patterns of motion, frame of reference and position, direction, and speed. — PS 1.1c-i, PS 5.1a-c

UNIT 4 *(previously Unit 2 – no other changes)*
HUMANS IN THEIR ENVIRONMENT: NEEDS AND TRADEOFFS (EXIT PROJECTS)

How does human consumption of resources impact the environment and our health?

Natural Resources and Energy

- Energy needs — LE 3.2a, PS 4.1a-d, PS 4.4d,e, ICT 1.1-1.4, 2.1-2.3, 4.1, 4.2, 5.1, 5.2, 6.1, 6.2, IPS 1.1-1.4, IPS 2.1
- Renewable and non-renewable sources of energy — PS 4.1a,b, ICT 5.1, 5.2
- Material needs — LE 3.2a, ICT 1.1-1.4, 2.1-2.3, 4.1, 4.2, 5.1, 5.2, 6.1, 6.2, IPS 1.1-1.4, IPS 2.1
- Renewable and non-renewable sources of materials — LE 6.1c, ICT 5.1, 5.2

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grade 8

UNIT 1
REPRODUCTION, HEREDITY, AND EVOLUTION
(see changes below)

How does life on Earth continue and adapt in response to environmental change?

Heredity

- Genes and DNA — LE 2.1a-e
- Mendelian genetics — LE 2.2a-c
- Mutations — LE 3.1a

Role of Sexual and Asexual Reproduction in Human Growth and Development

- The role of the sperm and egg — LE 4.2a,b
- Human reproductive system — LE 1.2i
- Hormonal regulation: Endocrine system — LE 1.2h
- Patterns of development: cell division and genetic expression — LE 4.3b
- Genetic diseases — LE 1.2j **add LE 2.2a**
- Genetic engineering, esp. cloning — LE 3.1c, IPS 1.2, 1.3

Natural Selection: The Driving Mechanism Behind Evolution

- Sources of variation in organisms — LE 3.1a
- Adaptations — LE 3.1a-c

UNIT 2 *(previously Unit 4 – no other changes)*
FORCES AND MOTION ON EARTH

How do we apply the laws of motion to explain the movement of objects on Earth?

General Skills (from NYS Core Curriculum)

– Follow safety procedures in the classroom and laboratory.

– Safely and accurately use the following measurement tools:
- metric ruler
- balance
- stopwatch
- spring scale.

– Use appropriate units for measured or calculated values.

– Recognize and analyze patterns and trends.

– Identify cause-and-effect relationships.

Physical Setting Skills (from NYS Core Curriculum)

– Determine the speed and acceleration of a moving object.

UNIT 3
EARTH, SUN, MOON SYSTEM
(no changes)

What roles do forces play in the patterns and stability of the Solar System?

- Observe, describe, and compare the effects of balanced and unbalanced forces on the motion of objects. — PS 1.1c,e,g,h
  - Newton's First Law of Motion: Inertia — PS 5.1c
  - gravity — PS 1.1d, PS 5.2a

General Skills (from NYS Core Curriculum)

– Follow safety procedures in the classroom and laboratory.

– Safely and accurately use the following measurement tools:
- metric ruler
- stopwatch
- spring scale.

– Use appropriate units for measured or calculated values.

– Recognize and analyze patterns and trends.

– Classify objects.

– Identify cause-and-effect relationships.

UNIT 4 *(previously Unit 2 – no other changes)*
HUMANS IN THEIR ENVIRONMENT: NEEDS AND TRADEOFFS (EXIT PROJECTS)

How does human consumption of resources impact the environment and our health?

- Environmental concerns: Acquisition and depletion of resources; Waste disposal; Land use and urban growth; Overpopulation; Global Warming; Ozone depletion; Acid rain; Air pollution; Water pollution; Impact on other organisms — LE 3.2b **add LE 7.1e**, LE 7.2c,d, ICT 1.2, 1.4, 2.1-2.3, 4.1, 4.2, 5.1, 5.2, 6.1, 6.2, IPS 1.1-1.4, IPS 2.1

- Energy conservation — PS 4.5a,b, ICT 1.1-1.4, 2.1-2.3, 4.1, 5.1, 5.2, 6.1, 6.2, IPS 1.1-1.4, IPS 2.1

Nutrition and Food Choices: Impact on the Environment and on our Health

Environment:

- Environmental Toxins: pesticides and herbicides; fertilizers; organic waste — LE 7.2c,d, ICT 6.1, IPS 1.1-1.4, IPS 2.1

The right hand column in each unit represents the Major Understandings taken from the New York State Intermediate Level Science Core Curriculum, available at www.emsc.nysed.gov/ciai/mst/pub/intersci.pdf.

PS = Physical Setting – Standard 4, LE = Living Environment – Standard 4, ICT = Interconnectedness: Common Themes – Standard 6 and IPS = Interdisciplinary Problem Solving – Standard 7. Science process skills from Standards 1, 2, 6 and 7 should be used in conjunction with this scope and sequence.

grade 8

UNIT 1 REPRODUCTION, HEREDITY, AND EVOLUTION *(see changes below)*	UNIT 2 *(previously Unit 4 – no other changes)* FORCES AND MOTION ON EARTH	UNIT 3 EARTH, SUN, MOON SYSTEM *(no changes)*	UNIT 4 *(previously Unit 2 – no other changes)* HUMANS IN THEIR ENVIRONMENT: NEEDS AND TRADEOFFS (EXIT PROJECTS)
How does life on Earth continue and adapt in response to environmental change?	***How do we apply the laws of motion to explain the movement of objects on Earth?***	***What roles do forces play in the patterns and stability of the Solar System?***	***How does human consumption of resources impact the environment and our health?***
• Competition — LE 3.2a • Extinction — LE 3.2b, LE 7.2d • Evidence for evolution — LE 3.2c,d **General Skills (from NYS Core Curriculum)** – Follow safety procedures in the classroom and laboratory. – Recognize and analyze patterns and trends. – Sequence events. **Living Environment Skills (from NYS Core Curriculum)** – Manipulate a compound microscope to view microscopic objects (*e.g., look at cells undergoing mitosis*). – Determine the size of a microscopic object using a compound microscope. – Design and use a Punnett square or a pedigree chart to predict the probability of certain traits. – Classify living things (*evolutionary relationships*).		**Physical Setting Skills (from NYS Core Curriculum)** – Given the latitude and longitude of a location, indicate its position on a map and determine the latitude and longitude of a given location on a map.	• Endangered species: Habitat destruction, over fishing — LE 7.2**b**,c,d **added b**; ICT 5.2; IPS 1.1-1.4; IPS 2.1 • Packaging and solid waste — ICT 5.2; IPS 1.1-1.4; IPS 2.1 • Water issues: depletion; pollution — LE 7.2c,d; ICT 5.2; IPS 1.1-1.4; IPS 2.1 Homeostasis and Health: • Analyzing nutritional value — LE 5.2a,b; ICT 6.1 • Food-borne illness: Infectious disease and the immune system (bacteria, parasites) — LE 1.2j; LE 5.2f; IPS 1.1-1.4; IPS 2.1 • System failures: heart disease; high blood pressure; colon cancer; epidemics of childhood obesity and diabetes; osteoporosis — LE 1.2j; LE 4.4d; LE 5.2f; IPS 1.1-1.4; IPS 2.1

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UNIT 1 REPRODUCTION, HEREDITY, AND EVOLUTION *(see changes below)*	UNIT 2 *(previously Unit 4 – no other changes)* FORCES AND MOTION ON EARTH	UNIT 3 EARTH, SUN, MOON SYSTEM *(no changes)*	UNIT 4 *(previously Unit 2 – no other changes)* HUMANS IN THEIR ENVIRONMENT: NEEDS AND TRADEOFFS (EXIT PROJECTS)
How does life on Earth continue and adapt in response to environmental change?	***How do we apply the laws of motion to explain the movement of objects on Earth?***	***What roles do forces play in the patterns and stability of the Solar System?***	***How does human consumption of resources impact the environment and our health?***
– Identify cause-and-effect relationships. – Identify structure and function relationships in organisms.			**General Skills (from NYS Core Curriculum)** – Follow safety procedures in the classroom and laboratory. – Safely and accurately use the following measurement tools: (*depends on project*). – Use appropriate units for measured or calculated values. – Recognize and analyze patterns and trends. – Sequence events. – Identify cause-and-effect relationships. – Use indicators and interpret results. [**Note:** Physical Setting and Living Environment skills will vary depending on projects pursued.]

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grade 8

How does life on Earth continue and adapt in response to environmental change?	How do we apply the laws of motion to explain the movement of objects on Earth?	What roles do forces play in the patterns and stability of the Solar System?	How does human consumption of resources impact the environment and our health?
			Living Environment – Interpret and/or illustrate the energy flow in a food chain, energy pyramid, or food web. – Identify structure and function relationships in organisms (within the study of system failures). **Physical Setting:** Look for opportunities to address density, as this is a significant concept for the ILSE.

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PS = Physical Setting – Standard 4, LE = Living Environment – Standard 4, ICT = Interconnectedness: Common Themes – Standard 6 and IPS = Interdisciplinary Problem Solving – Standard 7. Science process skills from Standards 1, 2, 6 and 7 should be used in conjunction with this scope and sequence.

acknowledgments

NYC Science Scope and Sequence K-8 was produced under the auspices of Joel I. Klein, Chancellor, Andrés Alonso, Deputy Chancellor for Teaching and Learning, and Brenda N. Steele, Executive Director of Curriculum and Professional Development. Grateful acknowledgement is extended to the following people for their valuable contribution to the development of this document:

Department of Mathematics and Science: Linda Curtis-Bey, Director of Mathematics and Science; Dr. Julia Rankin, Former Director of Science; Roy Harris, Frances Horne, Greg Borman, Marion Gaita Zachowski, John Tom, and Denise McNamara, Science Instructional Specialists.

Region 1: Judith Abel, RIS; Elizabeth O'Raffity, AP; Kevin Boston-Hill, AP; Karen Glazer, Elizabeth Cardona, Judith Rainford, Carol Pierce, Catherine Bethune, Mark Talty, and Shehnaz Hashim, Teachers.

Region 2: Nadya Awadalleh, RIS; Barbara Hartnett, AP; Auburn Ackie, Lead Teacher; Carol Ann Gilligan, Science Coordinator; Renee Jones, Russell Heath, Christine Zadrozny, Dawnette Phelps, and Sharon Whitter, Teachers.

Region 3: Marianita Damari, RIS; Jill Simpson-Mellow, RIS; Karleen Adam-Comrie, AP; Steve Radwan, M. Erderly, and Laura Pagano, Teachers.

Region 4: Michelle Cambier, RIS; Miriam Castro, RIS; William Voges, AP; Lynn Rapkiewicz, AP; Joe Sweeney, Gail Weinstein, Paul Nacinovich, Phyllis Mueses, Gina Mascia, Tom D'Emic, Dona Salvatto, Dara Sullivan, Christina Gartu, Donna Dowd, Gregory Grambo, Jennifer Miller, Tai Asia Mobley, and Vito Cipolla, Teachers.

Region 5: Diane Pillersdorf, RIS; Iris Battino-Bernstein, RIS; Robert Kleppel, UFT Teacher Center; Denise Johnson, Sheila Fields, Doreen Gordon, Kathy Edwards, Liliana Ramnauth, and Reena Grover, Teachers.

Region 6: Christine Mineo, RIS; John F. Herrera, Science Support Specialist; Allan Hirsch, Staff Developer/Teacher; Rita Fico, Staff Developer/Teacher; Claire Vassell-Williams and Stephanie Mitchell, Teachers.

Region 7: Charlene Smith, RIS; Joseph Scarmato, RIS; Amy Renz, AP; Ed Hernandez, AP; Joyce Chung, AP; Aileen Monaghan, Paul Stingo, Lorraine Sabbagh, Charlese Green, Eileen Brown, Joseph Mosachio, and Susan Crane, Teachers.

Region 8: Derresa Davis Tobin, RIS; Amy O'Donnell, RIS; Lisa Gioe-Cordi, Principal; Hazel Slinger, Isabelito Azcone, Jean Chester, Marta Lesmes, and Omatayo Olowoyo, Teachers.

Region 9: Megan Roberts, RIS; Kathleen Ponze, Principal; Lisa Nelson, Principal; Jack Ruolo, Emily Noto,Kristen Staffaroni, and Whitney Lukens, Staff Developers; Anna Cotton, Emily Dykstra, Ligia Chiorean, Sara Papsidero, JoEllen Schuleman, Caroline Baez, Alicia Sotiropoulos, Maureen Pricci, Denise Trezza, Katrina Klaf, and Traceylnn Hahn, Teachers.

Region 10: Sheldon Young, RIS; James Cole, AP; Olumuyiwa Oyefusi, Lead Teacher; Benjy Blatman, Travis Sloane, Kathy Tonnies, Bonifacio Garcia, Celeste Coppola, Jenelle Henderson, Sabrina Ford, and Zenaida Tapia, Teachers.

Districts 75 and 79: Giannina Convertino, RIS, District 75; Roberto Cruz, RIS, District 75; Derek Ramdass, Staff Developer, District 75; Lanez Atherton, Lionel Callendar, Debra Miller, Susan Cruz, and Yusuf Hamid, Teachers, District 75; Ellen Mandel, District 79.

Special thanks is extended to Region 4 and the Region 4 Science Leadership Team for being so instrumental in the development of the K-5 document. Thanks also go to Region 9 and the Region 9 Science Leadership Team for their assistance in the development of the Middle School Scope and Sequence.

The following advisors generously provided their commentary and suggestions: Marc Mayer, School at Columbia; Dr. Angela Calabrisi-Barton, Teachers College; Sandra Jenoure, Hunter College; Dr. Loren Weybright, Metropolitan College; Dr. Mark Miksic, Queens College; Dr. Don Cook, Dr. Jon Snyder, and Dr. Marvin Cohen, Bank Street College; Dr. Federica Raia, City College of New York; Dr. Hubert Dyasi, City College of New York; Dr. Rebecca Dyasi, City University of New York; Dr. Nancy Degnan, Columbia University; Richard Bollinger, Consultant; Marian Pasquale, Educational Development Center.

This manuscript was prepared for publication by the Office of Instructional Publications, Christopher Sgarro, Director. It was formatted by Tobey Hartman and copyedited by Judy Goldberg.