Wayne Central School District
Ontario Center, NY 14519

Science Curriculum

FOURTH GRADE
Draft

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I. District Philosophy

The Wayne Central School District believes that the goal of education is the all-around development of each student. The role of the school is to enable individuals to develop to their fullest potential.

The school, in cooperation with the home and community, will assist the student with intellectual, social, cultural, emotional, physical and moral growth. The school should help create within each student an awareness of civic responsibilities and respect for authority to assist the student in becoming a well-integrated, responsible person capable of assuming a vital role in an evolving civilization.

The Wayne Central School District subscribes to the general theory of individual differences; namely, that each student is an individual and has innate abilities, ambitions, and emotions. In the process of educating this individual, the program should provide a challenge while reflecting a concern for needs based on individual capabilities.

The Wayne Central School District further subscribes to the following fundamental principles:

1. **Children, regardless of potential, are capable of learning and acquiring the skill and knowledge needed to function to the best of their ability in our society,**

2. **Our responsibility is to see that children learn. The energies of all participants should be focused on achieving the desired outcomes. Accountability does not end with following established rules and procedures; its essence is found in results,**

3. **Minimum competence, while necessary, is not enough. Successful participation in our society demands much more. All children are entitled to approved curriculum, to instructional methods, and to expectations that challenge them to perform at their best, and help them to become truly proficient in knowledge and skills,**

4. **Every child in New York State is entitled to the resources necessary to provide the sound, basic education that the state constitution requires,**

5. **Each participant in the educational system should have the opportunity to effectively discharge his or her responsibility, and each participant should be held accountable for achieving desired results. This principle applies to all participants in the educational process – students, parents, teachers, counselors, librarians, administrators, the Board of Education, and others,**

6. **Achievement of desired results by individuals and groups should be rewarded. Creativity in our students needs to be nurtured and encouraged. Occasional failure in a large and diverse system us probably unavoidable. However, failure should not be permitted to persist. When it occurs, with either individuals or groups, help should be provided and the situation changed.**

II. District Mission Statement:

Based upon the belief that all students can learn, the staff of Wayne Central School district accepts the responsibility to teach all students regardless of differences, the fundamental skills. We further accept the responsibility to challenge all students to attain higher levels of achievement. Wayne Central will provide the opportunity, environment, and encouragement to meet this goal while developing the whole child physically, emotionally, and culturally.

III. NYS Learning Standards:

Health, Physical Education, and Home Economics

1. Personal Health and Fitness – Students will have the necessary knowledge and skills to establish and maintain physical fitness, participate in physical activity, and maintain personal health.
2. A Safe and Healthy Environment – Students will acquire the knowledge and ability necessary to create and maintain a safe and healthy environment
3. Resource Management – Students will understand and be able to manage their personal and community resources.

Mathematics, Science, and Technology

1. Analysis, Inquiry, and Design – Students will use mathematical analysis, scientific inquiry, and engineering design, as appropriate, to pose questions, seek answers, and develop solutions.
2. Information Systems – Students will access, generate, process, and transfer information using appropriate technologies
3. Mathematics – Students will understand mathematics and become mathematically confident by communicating and reasoning mathematically, by applying mathematics in real-world settings, and by solving problems through the integrated study of number systems, geometry, algebra, data analysis, probability, and trigonometry.
4. Science – Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.
5. Technology – Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.
6. Interconnectedness: Common Themes – Students will understand the relationships and common themes that connect mathematics, science, and technology and apply the themes to these and other areas of learning.
7. Interdisciplinary Problem Solving – Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.

English Language Arts

1. Students will listen, speak, read and write for information and understanding. As listeners and readers, students will collect data, facts and ideas; discover relationships, concepts, and generalizations; and use knowledge generated from oral, written, and electronically produced texts. As speakers and writers, they will use oral and written language that follows the accepted conventions of the English language to acquire, interpret, apply, and transmit information.
2. Language for Literary Response and Expression – Students will read and listen to oral, written, and electronically produced texts and performances from American and world literature; relate texts and performances to their own lives; and develop an understanding of the diverse social, historical, and cultural dimensions the texts and performances represent. As speakers and writers. Students will use oral and written language that follows the accepted conventions of the English language for self-expression and artistic creation.
3. Language for Critical Analysis and Evaluation – Students will listen, speak, read and write for critical analysis and evaluation. As listeners and readers, students will analyze experiences, ideas, information, and issues presented by others using a variety of established criteria. As speaker and writers, they will use oral and written language that follows the accepted conventions of the English language to present, from a variety of perspectives, their opinions and judgements on experiences, ideas, information and issues.
4. Language for Social Interaction – Students will listen, speak, read, and write for social interaction. Students will use oral and written language that follows the accepted conventions of the English language for effective social communication with a wide variety of people. As reader and listeners, they will use the social communications of others to enrich their understanding of people and their views.

Languages Other Than English

1. Communication Skills – Students will be able to use a language other than English for communication.
2. Cultural Understanding – Students will develop cross-cultural skills and understandings.

The Arts

1. Creating, Performing, and Participating in the Arts – Students will actively engage in the processes that constitute creation and performance in the arts (dance, mucus, theatre, and visual arts) and participate in various roles in the arts.
2. Knowing and Using arts materials and Resources – Students will be knowledgeable about and make use of the materials and resources available for participation in the arts in various roles.
3. Responding to and Analyzing Works of Art – Students will respond critically to a variety of works in the arts, connecting the individual work to other works and to other aspects of human endeavor and thought.
4. Understanding the Cultural Contributions of the Arts – Students will develop an understanding of the personal and cultural forces that shape artistic communication and how the arts in turn shape the diverse cultures of past and present society.

Career Development and Occupational Studies

1. Career Development – Students will be knowledgeable about the world of work, explore career options, and relate personal skills, aptitudes, and abilities to future career decisions.
2. Integrated Learning – Students will demonstrate how academic knowledge and skills are applied in the workplace and other settings.
3. Universal Foundation Skills – Students will demonstrate mastery of the foundation skills and competencies essential for success in the workplace.
4. Career Majors – Students who choose a career major will acquire the career-specific technical knowledge/skills necessary to progress toward gainful employment, career advancement, and success in postsecondary programs.

Social Studies

1. History of the United State and New York – Students will use a variety of intellectual skills to demonstrate their understanding of major ideas, eras themes, developments, and turning points in the history of the United States and New York.
2. World History – Students will use a variety of intellectual skills to demonstrate their understanding of major ideas, eras, themes, developments and turning points in world history and examine the broad sweep of history from a variety of perspectives.
3. Geography – Students will use a variety of intellectual skills to demonstrate their understanding of the geography of the interdependent world in which we live – local, national and global – including the distribution of people, places, and environments over the Earth's surface.
4. Economics – Students will use a variety of intellectual skills to demonstrate their understanding of how the United States and other societies develop economic systems and associated institutions to allocate scarce resources, how major decision-making units function in the United States and other national economies, and how an economy solves the scarcity problem through market and nonmarket mechanisms.
5. Civics, Citizenship, and Government – Students will use a variety of intellectual skills to demonstrate their understanding of the necessity for establishing governments; the governmental system of the United States Constitution; the basic civil values of American constitutional democracy; and the roles, rights, and responsibilities of citizenship including avenues of participation.

IV. Commencement Outcomes

"Adult Roles, Skills & Knowledge"

CITIZEN

A citizen is a responsible, law-abiding member of society who:

- Has a strong sense of values;
- Knows right from wrong;
- Is aware of community news, issues and norms;
- Accepts diversity in ethnicity and belief;
- Has knowledge of government at all levels and issues relative to each;
- Associates with others in positive and productive ways.

LIFE - LONG LEARNER

A life-long learner is one who perseveres, is self-motivated, is innately curious, focused and:

- Is able to set goals;
- Adheres to deadlines/due-dates, has time management skills and abilities;
- Is a problem solver, can define problems, analyze information and task analyze/prioritize potential solutions, has the ability to select the best "tool/strategy" for the situation, and can enlist others in the process of evaluation and refocusing.

LEADER

A leader is a problem solver with effective communication skills. He/she has an ability to motivate others and:

- Is a strong willed person with vision, beliefs and convictions to carry out each.
- Is able to recognize and effectively use all resources, such as material, time and human
- Is responsible and accountable for self and others.

WORKER/WAGE EARNER/BUSINESS OWNER

A worker/wage earner is an individual who is trust worthy, moral and ethical, and who:

- Possess basic job skills with a willingness to change, grow and develop new skills;
- Is a good communicator;
- Demonstrates leadership skills and initiative and the ability to work as a team player;
- Is responsible, reliable and respectful to others;
- Has the ability to make sound decisions.

CONSUMER

A consumer is an individual who has knowledge of the global economy and:

- Utilizes and applies budgeting skills and credit awareness;
- Maintains long-terms personal financial planning (savings, banking, retirement);
- Understand one's rights, responsibilities and risks.

COUNSELOR/TEACHER/MENTOR

A counselor/teacher/mentor is an individual who is patient, self-confident, assertive leader who:

- Is a problem solver and can guide others to solve problems;
- Is an active listener;
- Is aware of issues, societal, family, religious differences and different customs;
- Has interpersonal skills and values others opinions.

PARENT/FAMILY MEMBER

A parent/family member is an individual who:

- Is nurturing and loving;
- Displays flexibility;
- Has high character and morals;
- Is accountable and consistent with respect to expectations and follow through;
- Becomes actively involved in their children and family's education and other pursuits.

FRIEND

A friend is an individual who shows great interest and respect for others, and who:

- Is non-judgmental and available when a time of need arises;
- Is unselfish, honest, supportive, caring and genuine;
- Is an open-minded listener who seeks to understand before being understood;
- Give him/herself to other without expectations of compensation or return of favor.

V. Scope and Sequence

Wayne Central School District

SCIENCE K-5 SCOPE & SEQUENCE

MST PLANNING DOCUMENT FOR STANDARD 4
LIVING ENVIRONMENT

Key Idea 1: Living things are both similar to and different from each other and nonliving things.

Living Environment Performance Indicator 1.1 *Describe the characteristics of and variations between living and nonliving things.*

Major Understandings	**PK**	**K**	**1**	**2**	**3**	**4**	**5**
1.1a Animals need air, water, and food in order to live and **thrive**.	**I**	**T**	**M**	**R**	**R**	**R**	**R**
1.1b Plants require air, water, **nutrients**, and light in order to live and **thrive.**	**I**	**M**	**R**	**R**	**R**	**R**	**R**
1.1c **Nonliving** things do not live and **thrive.**		**I**	**I**	**I**	**T**	**M**	**R**
1.1d **Nonliving** things can be **human-created or naturally occurring.**				**I**	**T**	**M**	**R**

Living Environment Performance Indicator 1.2 *Describe the* **life processes** *common to all living things.*

Major Understandings	**PK**	**K**	**1**	**2**	**3**	**4**	**5**
1.2a Living things grow, take in nutrients, breathe, **reproduce, eliminate waste**, and die.	**I**	**I**	**I**	**T**	**E**	**M**	**R**

Key:

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Key Idea 2: Organisms inherit genetic information in a variety of ways that result in continuity of structure and function between parents and offspring.

Living Environment Performance Indicator 2.1 *Recognize that traits of living things are both* **inherited** *and* **acquired** *or learned.*

Major Understandings	**PK**	**K**	**1**	**2**	**3**	**4**	**5**
2.1a Some **traits** of living things have been inherited (e.g., color of flowers and number of limbs of animals).			**I**	**I**	**I**	**M**	**R**
2.1b Some **characteristics** result from an individual's **interactions** with the environment and cannot be inherited by the next **generation** (e.g., having scars; riding a bicycle).			**I**	**I**	**I**	**M**	**R**

Living Environment Performance Indicator 2.2 *Recognize that for humans and other living organisms there is genetic continuity between generations.*

Major Understandings	**PK**	**K**	**1**	**2**	**3**	**4**	**5**
2.2a Plants and animals closely **resemble** their parents and other individuals in their **species**.		**I**	**T**	**M**	**R**	**R**	**R**
2.2b Plants and animals can **transfer** specific traits to their **offspring** when they reproduce.			**I**	**I**	**I**	**M**	**R**

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Key Idea 3: Individual organisms and species change over time.

Living Environment Performance Indicator 3.1 *Describe how the* **structures** *of plants and animals* **compliment** *the environment of the plant or animal.*

Major Understandings	**PK**	**K**	**1**	**2**	**3**	**4**	**5**
3.1a Each animal has different **structures** that serve different **functions** in **growth, survival**, and reproduction. • Wings, legs, or fins enable some animals to seek shelter and to escape **predators**. • The mouth, including teeth, jaws, and tongue, enables some animals to eat and drink. • Eyes, nose, ears, tongue, and skin of some animals enable the animals to sense their surroundings. • Claws, shells, spines, feathers, fur, scales, and color of body covering enable them to **obtain** food. • Some animals have parts that are used to produce sounds and smells to help the animal meet its needs. • The characteristics os some animals change as **seasonal conditions** change (e.g., fur grows and is shed to help **regulate** body heat; body fat is a form of **stored food energy** as the season changes).	**I**	**I**	**T**	**T**	**T**	**M**	**R**

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Major Understandings	PK	K	1	2	3	4	5
3.1b Each plant has different structures that serve different functions in growth, survival, and reproduction. • Roots help support the plant and take in water and nutrients. • Leaves help plants **utilize** sunlight to make food for the plant. • Stems, stalks, trunks, and other similar structures provide support for the plant. • Some plants have flowers. • Flowers are **reproductive structures** of plants that produce fruit which contains seeds. • Seeds contain stored food that aids in **germination** and the growth of young plants.		**I**	**T**	**T**	**E**	**M**	
3.1c In order to survive in their environment, plants and animals must be **adapted** to that environment. • Seeds **disperse** by a plant's own mechanism and/or in a variety of ways that can include wind, water, and animals. • Leaf, flower, stem, and root **adaptations** may include **variations** in size, shape, thickness, color, small, and texture. • Animal adaptations include: **coloration** for **warning** or **attraction, camouflage, defense mechanisms,** movement, **hibernation,** and migration.	**-**	**-**	**I**	**T**	**T**	**M**	**R**

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Living Environment Performance Indicator 3.2 *Observe that differences within a species may give individuals an advantage in surviving and reproducing.*

Major Understandings	PK	K	1	2	3	4	5
3.2a Individuals within a species may compete each other for food, mates, space, water, and shelter in their environment.			**I**	**I**	**M**	**R**	**R**
3.2b All individuals have **variations**, and because of these variations, individuals of a species may have an **advantage** in surviving and reproducing.				**I**	**M**	**R**	**R**

Key Idea 4: The continuity of life is sustained through reproduction and development.

Living Environment Performance Indicator 4.1 *Describe the major stages in the life cycles of selected plants and animals.*

Major Understandings	PK	K	1	2	3	4	5
4.1a Plants and animals have **life cycles**. These may include beginning of a life, developing into an adult, reproduction as an adult, and eventually death.		**I**	**I**	**T**	**M**	**R**	**R**
4.1b Each kind of a plant goes through its own stages of growth and development that may include seed, young plant, and **mature** plant.		**I**	**I**	**T**	**E**	**M**	
4.1c The length of time from beginning of development to death of the plant is called its **life span**.		**I**	**I**	**T**	**E**	**M**	**R**
4.1d **Life cycles** of some plants include changes from seed to mature plant.		**I**	**I**	**T**	**E**	**M**	
4.1e Each **generation** of animals goes through changes in form from young to adult. This completed **sequence of changes** in form is called a life cycle. Some insects change from egg to **larva to pupa** to adult.			**I**	**T**	**M**	**R**	**R**

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Major Understandings	PK	K	1	2	3	4	5
4.1f Each kind of animal goes through its own stages of growth and development during its life span.			I	T	M	R	R
4.1g The length of time from an animal's birth to its death is called its life span. Life spans of different animals vary.			I	T	M	R	R

Living Environment Performance Indicator 4.2 *Describe evidence of growth,* **repair**, *and* **maintenance**, *such as nails, hair, and bone, and the healing of cuts and bruises.*

Major Understandings	PK	K	1	2	3	4	5
4.2a Growth is the process by which plants and animals increase in size.	I	M	R	R	R	R	R
4.2b Food supplies the energy and materials necessary for growth and repair.	I	T	E	E	E	M	R

Key Idea 5: Organisms maintain a dynamic equilibrium that sustains life.

Living Environment Performance Indicator 5.1 *Describe the basic* **life functions** *of common living* **specimens** *(e.g., guppies, mealworms, gerbils).*

Major Understandings	PK	K	1	2	3	4	5
5.1a All living things grow, take in nutrients, breathe, reproduce, and eliminate waste.		I	I	T	M	R	R
5.1b An **organism's external physical features** can enable it to carry out life functions in its particular environment.			I	I	T	M	R

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Living Environment Performance Indicator 5.2 *Describe some survival behaviors of common living* **specimens**.

Major Understandings	**PK**	**K**	**1**	**2**	**3**	**4**	**5**
5.2a Plants **respond** to changes in their environment. For example, the leaves of some green plants change positions as the direction of light changes; the parts of some plants undergo seasonal changes that enable the plant to grow; seeds germinate, and leaves form and grow.		**T**	**E**	**M**	**R**	**R**	**R**
5.2b Animals respond to change in their environment, (e.g., **perspiration**, heart rate, breathing rate, eye blinking, **shivering** and **salivating**).			**I**	**T**	**M**	**R**	**R**
5.2c Senses can provide essential information (regarding danger, food, mates, etc.) to animals about their environment.	**I**	**T**	**T**	**T**	**M**	**R**	**R**
5.2d Some animals, including humans, move from place to place to meet their needs.		**I**	**T**	**T**	**M**	**R**	**R**
5.2e Particular animal characteristics are influenced by changing environmental conditions including: fat storage in winter, coat thickness in winter, camouflage, shedding of fur.		**I**	**T**	**T**	**M**	**R**	
5.2f Some animal behaviors are influenced by environmental conditions. These behaviors may include: nest building, **hibernating**, hunting, **migrating**, and **communicating**.		**I**	**T**	**T**	**M**	**R**	**R**
5.2g The health, gorwth, and development of ogranisms are affected by environmental conditions such as the availablity of food, air, water, space, shelter, heat, and sunlight.		**I**	**T**	**M**	**R**	**R**	**R**

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Living Environment Performance Indicator 5.3 *Describe the factors that help* **promote** *good health and growth in humans.*

Major Understandings	PK	K	1	2	3	4	5
5.3a Humans need a variety of healthy foods, exercise and rest in order to grow and maintain good health.	**I**	**T**	**M**	**R**	**R**	**R**	**R**
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.	**I**	**T**	**T**	**T**	**M**	**R**	**R**

Key Idea 6: Plants and animals depend on each other and their physical environment.

Living Environment Performance Indicator 6.1 *Describe how plants and animals, including humans, depend upon each other and the nonliving environment.*

Major Understandings	PK	K	1	2	3	4	5
6.1a Green plants are producers because they provide the **basic food supply** for themselves and animals.			**I**	**T**	**T**	**M**	**R**
6.1b All animals depend on plants. Some animals (predators) eatother animals (prey).		**I**	**T**	**T**	**M**	**R**	**R**
6.1c Animals that eat plants for food may in turn become food for other animals. This sequence is called a **food chain**.		**I**	**T**	**T**	**M**	**R**	**R**
6.1d **Decomposers** are living things that play a vital role in recycling nutrients.					**T**	**M**	**R**
6.1e An organism's **pattern of behavior** is related to the nature of that organism's environment, including the kinds and numbers of other organisms present, the availability of food and other resources, and the physical characteristics of the environment.			**I**	**T**	**M**	**R**	**R**

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Living Environment Performance Indicator 6.2 *Describe the relationship of the Sun as an* **energy source** *for living and nonliving cycles.*

Major Understandings	PK	K	1	2	3	4	5
6.2a Plants **manufacture** food by **utilizing** air, water, and energy from the Sun.				T	E	M	R
6.2b The Sun's energy is transferred on Earth from plants to animals through the food chain.				T	E	M	R
6.2c **Heat energy** from the Sun powers the water cycle (see Physical Science Key Idea 2)			I	T	E	M	

Key Idea 7: Human decisions and activities have had a profound impact on the physical and living environments.

Living Environment Performance Indicator 7.1 *Identify ways in which humans have changed their environments and the effects of those changes.*

Major Understandings	PK	K	1	2	3	4	5
7.1a Humans **depend** on their natural and **constructed environments**.		I	T	M	R	R	R
7.1b Over time humans have changed their environment by **cultivating crops** and raising animals, creating shelter, using energy, manufacturing goods, developning means of transportation, **changing populations**, and carrying out other activities.			I	I	T	M	R
7.1c Humans, as individuals or **communities**, **change the environments** in ways that can either be helpful or harmful for themselves and other organisms.			I	I	T	M	R

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Wayne Central School District

SCIENCE K-5 SCOPE & SEQUENCE

MST PLANNING DOCUMENT FOR STANDARD 4
THE PHYSICAL SETTING

Key Idea 1: The Earth and celestial phenomena can be described by principles of relative motion and perspective.

Physical Setting Performance Indicator 1.1 ***Describe patterns of daily, monthly, and seasonal changes in their environment.***

Major Understandings	**PK**	**K**	**1**	**2**	**3**	**4**	**5**
1.1a **Natural cycles** and patterns include:							
• Earth spinning around once every 24 hours **(rotation)** resulting in day and night			**I**	**I**	**M**	**R**	**R**
• Earth moving in a path around the Sun **(revolution)**, resulting in one **earth year**			**I**	**I**	**M**	**R**	**R**
• The length of daylight and darkness varying with the seasons		**I**	**T**	**T**	**M**	**R**	
• Weather changing from day to day and through the seasons	**I**	**T**	**T**	**M**	**R**	**R**	**R**
• The appearance of the Moon changing as it moves in a path around Earth to complete a single cycle.		**I**	**I**	**I**	**M**	**R**	

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Major Understandings	PK	K	1	2	3	4	5
• Second, minute, hour			I	I	M	R	R
• Week, month		I	I	I	M		
1.1c The Sun and other stars appear to move in a **recognizable pattern** both daily and **seasonally.**			I	I	M		

Key Idea 2: Many of the phenomena that we observe on Earth involve interactions among components of air, water, and land.

Physical Setting Performance Indicator 2.1 *Describe the relationship among air, water and land on Earth.*

Major Understandings	PK	K	1	2	3	4	5
2.1a Weather is the condition of the outside air at a particular moment.	I	I	I	M	R		
2.1b Weather can be described and measured by: • Temperature • **Wind speed** and direction • Form and amount of **precipitation** • General sky conditions (cloudy, sunny, partly cloudy)	I	I	T	M	R		

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Major Understandings	PK	K	1	2	3	4	5
2.1c Water is recycled by natural processes on Earth.							
• **Evaporation:** changing of water (liquid) into water vapor (gas)				**M**	**R**		
• **Condensation:** changing of **water vapor** (gas) into **water (liquid)**				**M**	**R**		
• **Precipitation:** rain, sleet, snow, hail				**M**	**R**		
• **Run-off:** water flowing on the Earth's surface				**T**	**M**		**R**
• **Groundwater:** water that moves downward into the ground.				**T**	**M**		**R**
2.1d **Erosion and deposition** result from the interaction among air, water, and land. • Interaction between air and water breaks down earth materials • :Pieces of earth material may be moved by air, water, wind, and **gravity** • Pieces of earth material will settle or deposit on land or in the water in different places • Soil is composed of broken-down pieces of living and non-living **earth material**					**M**		**R**
2.1e **Extreme natural events** (floods, fires, earthquakes, volcanic eruptions, hurricanes, tornadoes, and other severe storms) may have **positive or negative impacts** on living things.				**I**	**M**		**R**

Key:

I Skill is introduced but not benchmarked
T Skill receives considerable instruction (taught but not benchmarked)
M Concept is mastered and benchmarked. Note that a skill may be introduced and benchmarked in one year. In those cases, only an M appears
R Concept is reviewed
E Expand

Key Idea 3: Matter is made up of particles whose properties determine the observable characteristics of matter and its reactivity

Physical Setting Performance Indicator 3.1 *Observe and describe properties of materials using appropriate tools.*

Major Understandings	PK	K	1	2	3	4	5
3.1a Matter takes up space and has **mass (weight)**. Two objects cannot occupy the same place at the same time.			**T**	**M**	**R**	**R**	**R**
3.1b Matter has properties that (color, hardness, odor, sound, taste, etc.) that can be observed thorugh the senses.		**I**	**T**	**M**		**R**	**R**
3.1c Objects have properties that can be observed, described and/or measured: length, width, **volume**, size, shape, mass or weight, **temperature**, **texture**, **reflectiveness of light.**		**I**	**T**	**T**	**T**	**M**	**R**
3.1d Measurements can be made with **standard metric units** and non-standard units (*Note: Exceptions to the metric system usage are found in meteorology.)*		**I**	**T**	**T**	**T**	**M**	**R**
3.1e The material(s) an object is made up of determine some specific properties of the object (sink/float, conductivity, **magnetism**). Properties can be observed or measured with tools such as **hand lenses, metric rulers**, thermometers, **balances, magnets, circuit testers** and **graduated cylinders**.			**I**	**T**	**T**	**M**	
3.1f Objects and/or materials can be sorted or classified according to their properties.	**I**	**T**	**E**	**E**	**E**	**M**	**R**
3.1g Some properties of an object are dependent on the **conditions of the present surroundings** in which the object exists. • temperature – hot or cold • lighting – shadows, color • moisture – wet or dry		**I**	**T**	**M**	**R**	**R**	**R**

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Physical Setting Performance Indicator 3.2 *Describe chemical and physical changes, including* **changes in state of matter**.

Major Understandings	PK	K	1	2	3	4	5
3.2a Matter exists in three states: solid, liquid, gas		I	T	M	R	R	R
• solids have a definite shape and volume			I	T	T	M	R
• liquids do not have a definite shape but have a definite volume			I	T	T	M	R
• gases do not hold their shape or volume			I	T	T	M	R
3.2b Temperature can affect the state of matter of a substance		I	I	T	M	R	R
3.2c Changes in the **properties** or materials of objects can be observed and described.	I	I	T	T	M	R	R

Key Idea 4: Energy exists in many forms, and when these forms change energy is conserved.

Physical Setting Performance Indicator 4.1 *Describe a variety of forms of energy (e.g., heat, chemical, light) and the changes that occur in objects when they interact with those forms of energy.*

Major Understandings	PK	K	1	2	3	4	5
4.1a Energy exists in various forms: heat, electric, sound, chemical, mechanical, light			I	I	T	M	R
4.1b Energy can be transferred from one place to another.				I	T	M	R
4.1c Some materials transfer energy better than others (heat and electricity).				I	T	M	R

Key:

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R Concept is reviewed
E Expand

Major Understandings	PK	K	1	2	3	4	5
4.1d Energy and matter interact: water is evaporated by the Sun's heat; a bulb is lighted by means of **electrical current**; a musical instrument is played to produce sound; dark colors may **absorb light**, light colors may **reflect light**.	**I**	**I**	**T**	**T**	**M**	**M**	**R**
4.1e Electricity travels in a **closed circuit**.				**T**		**M**	
4.1f Heat can be released in many ways, for example, by burning, rubbing **(friction)** or combining one substance with another.			**I**	**I**	**T**	**M**	**R**
4.1g Interactions with **forms of energy** can either by helpful or harmful.	**T**	**T**	**E**	**E**	**E**	**M**	**R**

Physical Setting Performance Indicator 4.2 *Observe the way one form of energy can be transferred into another form of energy present in common situations (e.g., mechanical to heat energy, mechanical to electrical energy, chemical to heat energy).*

Major Understandings	PK	K	1	2	3	4	5
4.2a Every day events involve one form of energy being changed to another. • Animals convert food to heat and motion • The Sun's energy warms the air and water		**I**	**I**	**T**	**M**	**R**	**R**
4.2b Humans utilize interactions between matter and energy.							
• Chemical to electrical, light, and heat: battery and bulb				**I**	**T**	**M**	
• Electrical to sound (e.g. doorbell buzzer)				**T**		**M**	
• Mechanical to sound (e.g. musical instruments, clapping)				**T**	**M**	**R**	
• Light to electrical (e.g. solar-powered calculator)					**T**	**M**	

Key:

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E Expand

Physical Setting Performance Indicator 5.1 *Describe the effects of common forces (pushes and pulls) of objects, such as those caused by gravity, magnetism, and* **mechanical forces**.

Major Understandings	PK	K	1	2	3	4	5
5.1a The position of an object can be described by locating it relative to another object or the background (e.g., on top of, next to, over, under, etc.).	I	T	T	M	R	R	
5.1b The **position or direction of motion** of an object can be changed by pushing or pulling.		I	I	T	M	R	
5.1c The force of gravity pulls objects toward the center of the Earth.		I	I	I	M	R	
5.1d The amount of change in the motion of an object is affected by friction.			I	I	M	R	
5.1e Magnetism is a force that may attract or **repel** certain materials.	I	I	M	R			
5.1f Mechanical energy may cause change in motion through the **application of force** and through the use of simple machines such as pulleys, levers, and inclined planes.					M		

Physical Setting Performance Indicator 5.2 *Describe how forces can operate across distances.*

Major Understandings	PK	K	1	2	3	4	5
5.2a The forces of gravity and magnetism can affect objects through gases, liquids, and solids.			I	I	M	R	R
5.2b The forces of magnetism on objects decreases as distance increases.		I	M	R	R		

Key:

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T Skill receives considerable instruction (taught but not benchmarked)
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VI. Course Overview

The Fourth Grade elementary science program emphasizes a hands-on and minds-on approach to learning. This approach will allow students to practice problem-solving skills, develop positive science attitudes, learn new science content and increase their scientific literacy. Ongoing assessments will test students' ability to explain, analyze and interpret scientific processes and phenomena more than their ability to recall specific facts. The units will include:

1. Batteries and Bulbs
2. Colored Solutions
3. Plants
4. Bones
5. Growing and Changing
6. Measurement
7. Crayfish

The NYS PETS (New York State Program Evaluating Test in Science) review materials are available to fourth grade teacher prior to the assessment. The activities review K-4 elementary science concepts, skills, knowledge and understandings.

VII. Instructional Outline

I. BATTERIES AND BULBS

3.1 Observe and describe properties of materials using appropriate tools.
- **3.1e** The material(s) an object is made up of determines some specific properties of the object (**conductivity**, **magnetism**). Properties can be observed or measured with tools such as **magnets** and **circuit testers**.

4.1 Describe a variety of forms of energy (e.g. heat, chemical, light) and the changes that occur in objects when they interact with those forms of energy.
- **4.1a** Energy exists in various forms: heat, electric, sound, chemical, mechanical, light.
- **4.1b** Energy can be transferred from one place to another.
- **4.1c** Some materials transfer energy better than others (heat and electricity).
- **4.1d** Energy and matter interact (a bulb is lighted by means of **electrical current**).
- **4.1e** Electricity travels in a **closed circuit**.
- **4.1g** Interactions with forms of energy can either be helpful or harmful.

4.2 Observe the way one form of energy can be transferred into another form of energy present in common situations (e.g., mechanical to electrical energy).
- **4.2b** Humans utilize interactions between matter and energy.
  - Chemical to electrical, light and heat: battery and bulb.

5.1 Describe the effects of common forces (pushes and pulls) of objects, such as those caused by magnetism.
- **5.1e** Magnetism is a force that may attract or **repel** certain materials.

SCIENTIFIC INQUIRY

1. The central purpose of scientific inquiry is to develop explanations of natural phenomena in a continuing, creative process.
   Students:
   - Ask "why" questions in attempts to seek greater understanding concerning objects and events they have observed and heard about.
   - Question the explanations they hear from others and read about, seeking clarification and comparing them with their own observations and understandings.
   - Develop relationships among observations to construct descriptions of objects and events and to form their own tentative explanations of what they have observed.

   This is evident, for example, when students:
   - Observe *a variety of objects that either sink or float when placed in a container of water*. Working in groups, they propose an explanation of *why objects sink or float*. After sharing and discussing their proposed explanation, they refine it and submit it for assessment. The explanation is rated on clarity and plausibility.

2. Beyond the use of reasoning and consensus, scientific inquiry involves the testing of proposed explanations involving the use of conventional techniques and procedures and usually requiring considerable ingenuity.
   Students:
   - Develop written plans for exploring phenomena or for evaluating explanations guided by questions or proposed explanations they have helped formulate.
   - Share their research plans with others and revise them based on their suggestions.
   - Carry out their plans for exploring phenomena through direct observation and through the use of simple instruments that permit measurements of quantities (e.g., length, mass, volume, temperature, and time).

   This is evident, for example, when students:
   - Are asked to develop a way of testing their explanation of *why objects sink or float when placed in a container of water*. They tell what procedures and materials they will use and indicate what results will support their explanation. Their plan is critiqued by others, the revise it, and submit it for assessment. The plan is rated on clarity, soundness in addressing the issue, and feasibility. After the teacher suggests modifications, the plan is carried out.

3. The observations made while testing proposed explanations, when analyzed using conventional and invented methods, provide new insights into phenomena.
   Students:
   - Organize observations and measurements of objects and events through classification and the preparation of simple charts and tables.
   - Interpret organized observations and measurements, recognizing simple patterns, sequences, and relationships.
   - Share their findings with others and actively seek their interpretations and ideas.
   - Adjust their explanations and understandings of objects and events based on their findings and new ideas.

   This is evident, for example, when students:
   - Prepare tables or other representations of their observations and look for evidence which supports or refutes their explanation of *why objects sink or float when placed in a container of water.* After sharing and discussing their results with other groups, they prepare a brief research report that includes methods, findings, and conclusions. The report is rated on its clarity, care in carrying out the plan, and presentation of evidence supporting the conclusions.

II. GROWING AND CHANGING

1.2 Describe the **life processes** common to all living things.
1.2a Living things grow, take in nutrients, breathe, **reproduce**, **eliminate waste**, and die.

2.1 Recognize that traits of living things are both **inherited** and **acquired** or learned.
2.1a Some **traits** have been inherited.
2.1b Some **characteristics** result from an individual's **interactions** with the environment and cannot be inherited by the next **generation**.

2.2 Recognize that for humans and other living organisms there is a genetic continuity between generations.
2.2a Plants and animals **resemble** their parents and other individuals in their **species.**
2.2b Plants and animals can **transfer** specific traits to their **offspring** when they reproduce.

4.1 Describe the major stages in the life cycles of selected plants and animals.
4.1a Plants and animals have **life cycles**. These may include beginning of a life, developing into an adult, reproduction as an adult, and eventually death.
4.1f Each kind of animal goes through it own stages of growth and development during its life span.
4.1g The length of time from an animals' birth to its death is called its life span. Life spans of different animals vary.

4.2 Describe evidence of growth, **repair**, and maintenance, such as nails, hair, and bone, and the healing of cuts and bruises.
4.2a Growth is the process by which plants and animals increase in size.
4.2b Food supplies the energy and materials necessary for growth and repair.

5.1 Describe the basic **life functions** of common living **specimens**.
5.1a All living things grow, take in nutrients, breathe, reproduce and eliminate waste.

5.2 Describe some survival behaviors of common living **specimens**.
5.2b Animals respond to change in their environments (e.g., **perspiration**, heart rate, breathing rate, eye blinking, **shivering**, and **salivating**).
5.2f Some animal behaviors are influenced by environmental conditions.
5.2g The health, growth, and development of organisms are affected by the environmental conditions such as the availability of food, air, water, space, shelter, heat, and sun.

5.3 Describe the factors that help **promote** good health and growth in humans.
5.3a Humans need a variety of healthy foods, exercise, and rest in order to grow and maintain good health.
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.

III. PLANT STUDY

1.1 Describe the characteristics of and variations between living and nonliving things.
- **1.1a** Animals need air, water, and food in order to live and **thrive**.
- **1.1b** Plants require air, water, **nutrients**, and light in order to live and thrive.
- **1.1c** Nonliving things do not live and thrive.
- **1.1d** Nonliving things can be **human-created** or **naturally occurring**.

1.2 Describe the **life processes** common to all living things.
- **1.2a** Living things grow, take in nutrients, breathe, **reproduce**, **eliminate waste**, and die.

2.1 Recognize that traits of living things are both **inherited** and **acquired** or learned.
- **2.1a** Some **traits** of living things have been inherited (e.g., color of flowers and number of limbs of animals).

2.2 Recognize that for humans and other living organisms there is genetic continuity between generations.
- **2.2a** Plants and animals closely **resemble** parents and other individuals in their **species**.
- **2.2b** Plants and animals can **transfer** specific traits to their **offspring** when they reproduce.

3.1 Describe how the **structures** of plants and animals **compliment** the environment of the plant or animal.
- **3.1b** Each plant has different structures that serve different functions in growth, survival, and reproduction.
  - Leaves help plants **utilize** sunlight to make food for the plant.
  - Seeds contain stored food that aids in **germination** and the growth of young plants.
- **3.1c** In order to survive in their environment, plants must be **adapted** to that environment.
  - Seeds **disperse** by a plant's own mechanism and/or in a variety of ways that can include wind, water, and animals.
  - Leaf, flower, stem, and root **adaptations** may include **variations** in size, shape, thickness, color, smell, and texture.

4.1 Describe the major stages in life cycles of selected plants and animals.
- **4.1a** Plants and animals have life cycles. These may include beginning of a life, developing into an adult, reproduction as an adult, and eventually death.
- **4.1b** Each kind of plant goes through its own stages of growth and development that may include see young plant, and mature plant.
- **4.1c** The length of time from beginning of development to death of the plant is called its **life span**.
- **4.1d** Life cycles of some plants include changes from seed to mature plant.

4.2 Describe the evidence of growth, **repair**, and **maintenance**, such as nails, hair, and bone and the healing of cuts and bruises.
- **4.2a** Growth is the process by which plants and animals increase in size.
- **4.2b** Food supplies the energy and materials necessary for growth and repair.

5.1 Describe basic **life functions** of common living **specimens**.
- **5.1a** All living things grow, take in nutrients, breathe, reproduce, and eliminate waste.
- **5.1b** An **organism's external physical features** can enable it to carry out life functions in its particular environment.

5.2 Describe some survival behaviors of common living **specimens**.
- **5.2a** Plants **respond** to changes in their environment. For example, the leaves of some green plants change positions as the direction of light changes; the parts of some plats undergo seasonal changes that enable them plant to grow; seeds germinate, and leaves form and grow.

6.1 Describe how plants and animals, including humans, depend upon each other and the nonliving environment.

6.1a Green plants are producers because they provide the **basic food supply** for themselves and animals.

6.1b All animals depend on plants. Some animals (predators) eat other animals (prey).

6.1c Animals that eat plants for food may in turn become food for other animals. This sequence is called the **food chain**.

6.1d **Decomposers** are living things that play a vital role in recycling nutrients.

6.1e An organism's **pattern of behavior** is related to the nature of that organism's environment, including the kinds and numbers of other organisms present, the availability of food and other resources, and the physical characteristics of the environment.

6.2 Describe the relationship of the Sun as an **energy source** for living and nonliving cycles.

6.2a Plants **manufacture** food for **utilizing** air, water, and energy from the Sun.

6.2b The Sun's energy is transferred on Earth from plants to animals through the food chain.

6.2c **Heat energy** from the Sun powers the water cycle (see Physical Science Key Idea 2)

SCIENTIFIC INQUIRY

1. The central purpose of scientific inquiry is to develop explanations of natural phenomena in a continuing, creative process.

   Students:

   - Ask "why" question in attempts to seek greater understanding concerning objects and events they have observed and heard about.
   - Question the explanations they hear from others and read about, seeking clarification and comparing them with their own observations and understandings.
   - Develop relationships among observations to construct descriptions of objects and events and to form their own tentative explanations of what they have observed.

   This is evident, for example, when students:

   - Observe *a variety of objects that either sink or float when placed in a container of water*. Working in groups, they propose an explanation of *why objects sink or float*. After sharing and discussing their proposed explanation, they refine it and submit it for assessment. The explanation is rated on clarity and plausibility.

2. Beyond the use of reasoning and consensus, scientific inquiry involves the testing of proposed explanations involving the use of conventional techniques and procedures and usually requiring considerable ingenuity.

   Students:

   - Develop written plans for exploring phenomena or for evaluating explanations guided by questions or proposed explanations they have helped formulate.
   - Share their research plans with others and revise them based on their suggestions.
   - Carry out their plans for exploring phenomena through direct observation and through the use of simple instruments that permit measurements of quantities (e.g., length, mass, volume, temperature, and time).

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3. The observations made while testing proposed explanations, when analyzed using conventional and invented methods, provide new insights into phenomena.
   Students:
   - Organize observations and measurements of objects and events through classification and the preparation of simple charts and tables.
   - Interpret organized observations and measurements, recognizing simple patterns, sequences, and relationships.
   - Share their findings with others and actively seek their interpretations and ideas.
   - Adjust their explanations and understandings of objects and events based on their findings and new ideas.

   This is evident, for example, when students:
   - Prepare tables or other representations of their observations and look for evidence which supports or refutes their explanation of *why objects sink or float when placed in a container of water*. After sharing and discussing their results with other groups, they prepare a brief research report that includes methods, findings, and conclusions. The report is rated on its clarity, care in carrying out the plan, and presentation of evidence supporting the conclusions.

IV. CRAYFISH

1.1 Describe the characteristics of and variations between living and nonliving things.
1.1a Animals need air, water, and food in order to live and **thrive**.
1.2 Describe the life processes common to all living things.
1.2a Living things grow, take in nutrients, breathe, **reproduce, eliminate waste**, and die.
3.1 Describe how the structures of plants and animals compliment the environment of the plant or animal.
3.1a Each animal has different structures that serve different **functions** in **growth**, **survival**, and reproduction.
3.1c In order to survive in their environment, plants and animals must be **adapted** to that environment.
3.2 Observe that differences within a species may give individuals an advantage in surviving and reproducing.
3.2a Individuals within a species may compete each other for food, mates, space, water, and shelter in their environment.
3.2b All individuals have **variations**, and because of these variations, individuals of a species may have an **advantage** in surviving and reproducing.
5.1 Describe the basic life functions of common living specimens (e.g., guppies, mealworms, gerbils).
5.1b An **organism's external physical features** can enable it to carry out life functions in its particular environment.
5.2 Describe some survival behaviors of common living specimens.
5.2b Animals respond to change in their environment (e.g., **perspiration**, heart rate, breathing rate, eye blinking, **shivering** and **salivating**).
6.1 Describe how plants and animals, including humans, depend upon each other and the nonliving environment.
6.1b All animals depend on plants. Some animals (predators) eat other animals (prey).

SCIENTIFIC INQUIRY

1. The central purpose of scientific inquiry is to develop explanations of natural phenomena in a continuing, creative process.
   Students:
   - Ask "why" questions in attempts to seek greater understanding concerning objects and events they have observed and heard about.
   - Question the explanations they hear from others and read about, seeking clarification and comparing them with their own observations and understandings.
   - Develop relationships among observations to construct descriptions of objects and events and to form their own tentative explanations of what they have observed.

This is evident, for example, when students:

- Observe *a variety of objects that either sink or float when placed in a container of water*. Working in groups, they propose an explanation of *why objects sink or float*. After sharing and discussing their proposed explanation, they refine it and submit it for assessment. The explanation is rated on clarity and plausibility.

2. Beyond the use of reasoning and consensus, scientific inquiry involves the testing of proposed explanations involving the testing of proposed explanations involving the use of conventional techniques and procedures and usually requiring considerable ingenuity.
   Students:
   - Develop written plans for exploring phenomena or for evaluating explanations guided by questions or proposed explanations they have helped formulate.
   - Share their research plans with others and revise them based on their suggestions.
   - Carry out their plans for exploring phenomena through direct observation and through the use of simple instruments that permit measurements of quantities (e.g., length, mass, volume, temperature, and time).

   This is evident, for example, when students:
   - Are asked to develop a way to testing their explanation of *why objects sink or float when placed in a container of water*. They tell what procedures and materials they will use and indicate what results will support their explanation. Their plan is critiqued by others, they revise it, and submit it for assessment. The plan is rated on clarity, soundness in addressing the issue, and feasibility. After the teacher suggests modifications, the plan is carried out.

3. The observations made while testing proposed explanations, when analyzed using conventional and invented methods, provide new insights into phenomena.
   Students:
   - Organize observations and measurements of objects and events through classification and the preparation of simple charts and tables.
   - Interpret organized observations and measurements, recognizing simple patterns, sequences, and relationships.
   - Share their findings with others and actively seek their interpretations and ideas.
   - Adjust their explanations and understandings of objects and events based on their findings and new ideas.

   This is evident, for example, when students:
   - Prepare tables or other representations of their own observations and look for evidence which supports or refutes their explanation of *why objects sink or float when placed in a container of water*. After sharing and discussing their results with other groups, they prepare a brief research report that includes methods, findings, and conclusions. The report is rated on its clarity, care in carrying out the plan, and presentation of evidence supporting the conclusions.

V. ANIMAL STUDY (BONES)

3.1 Describe how the structures of plants and animals compliment the environment of the plant or animal.

3.1a Each animal has different **structures** that serve different **functions** in **growth**, **survival**, and reproduction.

- Wings, legs, or fins enable some animals to seek shelter and to escape **predators**.
- The mouth, including teeth, jaws, and tongue, enables some animals to eat and drink.
- Claws, shells, spines, feathers, fur, scales, and color of body covering enable them to **obtain** food.

3.1c In order to survive in their environment, plants and animals must be **adapted** to that environment.

- Animal **adaptations** include: **coloration** for **warning** or **attraction**, **camouflage**, **defense mechanisms**, movement, **hibernation**, and migration.

3.2 Observe the differences within a species may give individuals an advantage in surviving and reproducing.

3.2b All individuals have **variations**, and because of these variations individuals of a species may have an **advantage** in surviving and reproducing.

5.1 Describe the basic **life functions** of common living **specimens** (e.g., guppies, mealworms, gerbils).

5.1b An **organism's external physical features** can enable it to carry out life functions in its particular environment.

5.2 Describe some survival behaviors of common living **specimens**.

5.2d Some animals, including humans, move from place to place to meet their needs.

SCIENTIFIC INQUIRY

1. The central purpose of scientific inquiry is to develop explanations of natural phenomena in a continuing, creative process.

   Students:

   - Ask "why" questions in attempts to seek greater understanding concerning objects and events they have observed and heard about.
   - Question the explanations they hear from others and read about, seeking clarification and comparing them with their own observations and understandings.
   - Develop relationships among observations to construct descriptions of objects and events and to form their own tentative explanations of what they have observed.

   This is evident, for example, when students:

   - Observe *a variety of objects that either sink or float when placed in a container of water.* Working in groups, they propose an explanation of *why objects sink or float*. After sharing and discussing their proposed explanation, they refine it and submit it for assessment. The explanation is rated on clarity and plausibility.

2. Beyond the use of reasoning and consensus, scientific inquiry involves the testing of proposed explanations involving the use of conventional techniques and procedures and usually requiring considerable ingenuity.

   Students:

   - Develop written plans for exploring phenomena or for evaluating explanations guided by questions or proposed explanations they have helped formulate.
   - Share their research plans with others and revise them based on their suggestions.
   - Carry out their plans for exploring phenomena through direct observation and through the use of simple instruments that permit measurements of quantities (e.g., length, mass, volume, temperature, and time).

   This is evident, for example, when students:

   - Are asked to develop a way of testing their explanation of *why objects sink or float when placed in a container of water*. They tell what procedures and materials they will use and indicate what results will support their explanation. Their plan is critiqued by others, the revise it, and submit it for assessment. The plan is rated on clarity, soundness in addressing the issue, and feasibility. After the teacher suggests modifications, the plan is carried out.

3. The observations made while testing proposed explanations, when analyzed using conventional and invented methods, provide new insights into phenomena.

   Students:

   - Organize observations and measurements of objects and events through classification and the preparation of simple charts and tables.
   - Interpret organized observations and measurements, recognizing simple patterns, sequences, and relationships.
   - Share their findings with others and actively seek their interpretations and ideas.
   - Adjust their explanations and understandings of objects and events based on their findings and new ideas.

This is evident, for example, when students:

- Prepare tables or other representation of their observations and look for evidence which supports or refutes their explanation of *why objects sink or float when placed in a container of water*. After sharing and discussing their results with other groups, they prepare a brief research report that includes methods, findings, and conclusions. The report is rated on its clarity, care in carrying out the plan, and presentation of evidence supporting the conclusions.

VI. MEASUREMENT

3.1 Observe and describe properties of materials using appropriate tools.

3.1a Matter takes up space and has **mass (weight).** Two objects cannot occupy the same place at the same time.

3.1c Objects have properties that can be observed, described, and/or measured: length, width, **volume**, size, shape, mass or weight, **temperature**, texture, reflectiveness of light.

3.1e The material(s) an object is made up of determine some specific properties of the object (sink/float, conductivity, **magnetism**). Properties can be observed or measured with tools such as **hand lenses, metric rulers**, thermometers, **balances, magnets, circuit testers**, and **graduated cylinders.**

SCIENTIFIC INQUIRY

1. The central purpose of scientific inquiry is to develop explanations of natural phenomena in a continuing, creative process.

   Students:

   - Ask "why" questions in attempts to seek greater understanding concerning objects and events they have observed and heard about.
   - Question the explanations they hear from others and read about, seeking clarification and comparing them with their own understandings.
   - Develop relationships among observations to construct descriptions of objects and events and to form their own tentative explanations of what they have observed.

   This is evident, for example, when students:

   - Observe *a variety of objects that either sink or float when placed in a container of water*. Working in groups, they propose an explanation of *why objects sink or float*. After sharing and discussing their proposed explanation, they refine it and submit it for assessment. The explanation is rated on clarity and plausibility.

2. Beyond the use of reasoning and consensus, scientific inquiry involves the testing of proposed explanations involving the use of conventional techniques and procedures and usually requiring considerable ingenuity.

   Students:

   - Develop written plans for exploring phenomena or for evaluating explanations guided by questions or proposed explanations the have helped formulate.
   - Share their research plans with others and revise them based on their suggestions.
   - Carry out their plans for exploring phenomena through direct observation and through the use of simple instruments that permit measurements of quantities (e.g., length, mass, volume, temperature, and time).

   This is evident, for example, when students:

   - Are asked to develop a way of testing their explanation of *why objects sink or float when placed in a container of water*. They tell what procedures and materials they will use and indicate what results will support their explanation. Their plan is critiqued by others, they revise it, and submit it for assessment. The plan is rated on clarity, soundness in addressing the issue, and feasibility. After the teacher suggests modifications, the plan is carried out.

3. The observations made while testing proposed explanations, when analyzed using conventional and invented methods, provide new insights into phenomena.
   Students:
   - Organize observations and measurements of objects and events through classification and the preparation of simple charts and tables.
   - Interpret organized observations and measurements, recognizing simple patterns, sequences, and relationships.
   - Share their findings with others and actively seek their interpretations and ideas.
   - Adjust their explanations and understandings of objects and events based on their findings and new ideas.

   This is evident, for example, when students:
   - Prepare tables or other representations of their observations and look for evidence which supports or refutes their explanation of *why objects sink or float when placed in a container of water*. After sharing and discussing their results with other groups, they prepare a brief research report that includes methods, findings, and conclusions. The report is rated on its clarity, care in carrying out the plan, and presentation of evidence supporting the conclusions.

VII. COLORED SOLUTIONS

3.1 Observe and describe properties of materials using appropriate tools.
- **3.1a** Matter takes up space and has **mass** (weight).
- **3.1b** **Matter** has properties that can be observed through the senses.
- **3.1c** Objects have **properties** that can be observed, described, and/or measured.
- **3.1e** The material(s) an object is made up of determine some specific properties of the object (i.e. sink/float). Properties can be observed with tools such as **graduated cylinders**.

SCIENTIFIC INQUIRY

1. The central purpose of scientific inquiry is to develop explanations of natural phenomena in a continuing, creative process.
   Students:
   - Ask "why" questions in attempts to seek greater understanding concerning objects and events they have observed and heard about.
   - Question the explanations they hear from others and read about, seeking clarification and comparing them with their own observations and understandings.
   - Develop relationships among observations to construct descriptions of objects and events and to form their own tentative explanations of what they have observed.

   This is evident, for example, when students:
   - Observe *a variety of objects that either sink or float when placed in a container of water*. Working in groups, they propose an explanation of *why objects sink or float*. After sharing and discussing their proposed explanation, they refine it and submit it for assessment. The explanation is rated on clarity and plausibility.

2. Beyond the use of reasoning and consensus, scientific inquiry involves the testing of proposed explanations involving the use of conventional techniques and procedures and usually requiring considerable ingenuity.
   Students:
   - Develop written plans for exploring phenomena or for evaluating explanations guided by questions or proposed explanations they have helped formulate.
   - Share their research plans with others and revise them based on their suggestions.
   - Carry out their plans for exploring phenomena through direct observation and through the use of simple instruments that permit measurements of quantities (e.g., length, mass, volume, temperature, and time).

This is evident, for example, when students:

- Are asked to develop a way of testing their explanation of why objects sink or float when placed in a container of water. They tell what procedures and materials they will use and indicate what results will support their explanation. Their plan is critiqued by others, they revise it, and submit it for assessment. The plan is rated on clarity, soundness in addressing the issue, and feasibility. After the teacher suggests modifications, the plan is carried out.

3. The observations made while testing proposed explanations, when analyzed using conventional and invented methods provide new insights into phenomena.

Students:

- Organize observations and measurements of objects and events through classification and the preparation of simple charts and tables.
- Interpret organized observations and measurements, recognizing simple patterns, sequences, and relationships.
- Share their findings with others and actively seek their interpretations and ideas.
- Adjust their explanations and understandings of objects and events based on their findings and new ideas.

This is evident, for example, when students:

- Prepare tables or other representations of their observations and look for evidence which supports or refutes their explanation of why objects sink or float when placed in a container of water. After sharing and discussing their results with other groups, they prepare a brief research report that includes methods, findings, and conclusions. The report is rated on its clarity, care in carrying out the plan, and presentation of evidence supporting the conclusions.

VIII. Course Benchmarks

IX. Units of Study

Unit One

Batteries and Bulbs

A. Unit Benchmarks

1. Observe and describe properties of materials using appropriate tools.
   - The material(s) an object is made up of determines some specific properties of the object (**conductivity**, **magnetism**). Properties can be observed or measured with tools such as **magnets** and **circuit testers**.
2. Describe a variety of forms of energy (e.g. heat, chemical, light) and the changes that occur in objects when they interact with those forms of energy.
   - Energy exists in various forms: heat, electric, sound, chemical, mechanical, light.
   - Energy can be transferred from one place to another.
   - Some materials transfer energy better than others (heat and electricity).
   - Energy and matter interact (a bulb is lighted by means of **electrical current**).
   - Electricity travels in a **closed circuit**.
   - Interactions with forms of energy can either be helpful or harmful.
3. Observe the way one form of energy can be transferred into another form of energy present in common situations (e.g., mechanical to electrical energy).
   - Humans utilize interactions between matter and energy.
   - Chemical to electrical, light and heat: battery and bulb.
4. Describe the effects of common forces (pushes and pulls) of objects, such as those caused by magnetism.
   - Magnetism is a force that may attract or **repel** certain materials.

B. Unit Assessment

C. Rubric

D. Activities

1. Teacher Constructed Activities:

Activity	Benchmark	Standard	Application Level
a. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
b. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
c. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
d. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

2. Textbook with Teaching Strategies

Activity	Benchmark	Standard	Application Level
a. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
b. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
c. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
d. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

3. Computer Assisted Instruction

Activity	Benchmark	Standard	Application Level
a. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
b. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
c. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
d. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

4. Cross Disciplinary

Activity	Benchmark	Standard	Application Level
a. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
b. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
c. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
d. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

5. Miscellaneous

Activity	Benchmark	Standard	Application Level
a. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
b. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
c. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
d. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

E. Vocabulary

conductivity
magnetism
conductors
magnets
circuit testers
electrical current
closed circuit
repel/attract

F. References and Resources

Unit Two

Growing and Changing

A. Unit Benchmarks

At the end of this unit students will be able to;

1. Describe the **life processes** common to all living things.
   - Living things grow, take in nutrients, breathe, **reproduce**, **eliminate waste**, and die.
2. Recognize that traits of living things are both **inherited** and **acquired** or learned.
   - Some **traits** have been inherited.
   - Some **characteristics** result from an individual's **interactions** with the environment and cannot be inherited by the next **generation**.
3. Recognize that for humans and other living organisms there is a genetic continuity between generations.
   - Plants and animals **resemble** their parents and other individuals in their **species.**
   - Plants and animals can **transfer** specific traits to their **offspring** when they reproduce.
4. Describe the major stages in the life cycles of selected plants and animals.
   - Plants and animals have **life cycles**. These may include beginning of a life, developing into an adult, reproduction as an adult, and eventually death.
   - Each kind of animal goes through it own stages of growth and development during its life span.
   - The length of time from an animals' birth to its death is called its life span. Life spans of different animals vary.
5. Describe evidence of growth, **repair**, and maintenance, such as nails, hair, and bone, and the healing of cuts and bruises.
   - Growth is the process by which plants and animals increase in size.
   - Food supplies the energy and materials necessary for growth and repair.
6. Describe the basic **life functions** of common living **specimens**.
   - All living things grow, take in nutrients, breathe, reproduce and eliminate waste.
7. Describe some survival behaviors of common living **specimens**.
   - Animals respond to change in their environments (e.g., **perspiration**, heart rate, breathing rate, eye blinking, **shivering**, and **salivating**).
   - Some animal behaviors are influenced by environmental conditions.
   - The health, growth, and development of organisms are affected by the environmental conditions such as the availability of food, air, water, space, shelter, heat, and sun.
8. Describe the factors that help **promote** good health and growth in humans.
   - Humans need a variety of healthy foods, exercise, and rest in order to grow and maintain good health.
   - 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.

B. Unit Assessment

C. Rubric

D. Activities

1. Teacher Constructed Activities:

Activity	Benchmark	Standard	Application Level
a. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
b. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
c. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
d. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

2. Textbook with Teaching Strategies

Activity	Benchmark	Standard	Application Level
a. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
b. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
c. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
d. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

3. Computer Assisted Instruction

Activity	Benchmark	Standard	Application Level
a. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
b. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
c. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
d. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

4. Cross Disciplinary

Activity	Benchmark	Standard	Application Level
a. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
b. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
c. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
d. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

5. Miscellaneous

Activity	Benchmark	Standard	Application Level
a. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
b. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
c. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
d. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

E. Vocabulary

life process
reproduce
eliminate waste
inherited
acquired
traits
characteristics
interactions
generation
resemble
species
transfer
offspring
life cycles
repair
life functions
specimens
perspiration
shivering
salivating
promote
harmful substances
engaging in

F. References and Resources

Unit Three

Plant Study

A. Unit Benchmarks

At the end of this unit students will be able to;

1. Describe the characteristics of and variations between living and nonliving things.
   - Animals need air, water, and food in order to live and **thrive**.
   - Plants require air, water, **nutrients**, and light in order to live and thrive.
   - Nonliving things do not live and thrive.
   - Nonliving things can be **human-created** or **naturally occurring**.
2. Describe the **life processes** common to all living things.
   - Living things grow, take in nutrients, breathe, **reproduce**, **eliminate waste**, and die.
3. Recognize that traits of living things are both **inherited** and **acquired** or learned.
   - Some **traits** of living things have been inherited (e.g., color of flowers and number of limbs of animals).
4. Recognize that for humans and other living organisms there is genetic continuity between generations.
   - Plants and animals closely **resemble** parents and other individuals in their **species**.
   - Plants and animals can **transfer** specific traits to their **offspring** when they reproduce.
5. Describe how the **structures** of plants and animals **compliment** the environment of the plant or animal.
   - Each plant has different structures that serve different functions in growth, survival, and reproduction.
     - Leaves help plants **utilize** sunlight to make food for the plant.
     - Seeds contain stored food that aids in **germination** and the growth of young plants.
   - In order to survive in their environment, plants must be **adapted** to that environment.
     - Seeds **disperse** by a plant's own mechanism and/or in a variety of ways that can include wind, water, and animals.
     - Leaf, flower, stem, and root **adaptations** may include **variations** in size, shape, thickness, color, smell, and texture.
6. Describe the major stages in life cycles of selected plants and animals.
   - Plants and animals have life cycles. These may include beginning of a life, developing into an adult, reproduction as an adult, and eventually death.
   - Each kind of plant goes through its own stages of growth and development that may include see young plant, and mature plant.
   - The length of time from beginning of development to death of the plant is called its **life span**.
   - Life cycles of some plants include changes from seed to mature plant.
7. Describe the evidence of growth, **repair**, and **maintenance**, such as nails, hair, and bone and the healing of cuts and bruises.
   - Growth is the process by which plants and animals increase in size.
   - Food supplies the energy and materials necessary for growth and repair.
8. Describe basic **life functions** of common living **specimens**.
   - All living things grow, take in nutrients, breathe, reproduce, and eliminate waste.
   - An **organism's external physical features** can enable it to carry out life functions in its particular environment.
9. Describe some survival behaviors of common living **specimens**.
   - Plants **respond** to changes in their environment. For example, the leaves of some green plants change positions as the direction of light changes; the parts of some plats undergo seasonal changes that enable them plant to grow; seeds germinate, and leaves form and grow.
10. Describe how plants and animals, including humans, depend upon each other and the nonliving environment.
    - Green plants are producers because they provide the **basic food supply** for themselves and animals.
    - All animals depend on plants. Some animals (predators) eat other animals (prey).
    - Animals that eat plants for food may in turn become food for other animals. This sequence is called the **food chain**.
    - **Decomposers** are living things that play a vital role in recycling nutrients.

B. Unit Assessment

C. Rubric

D. Activities

1. Teacher Constructed Activities:

Activity	Benchmark	Standard	Application Level
a. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
b. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
c. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
d. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

2. Textbook with Teaching Strategies

Activity	Benchmark	Standard	Application Level
a. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
b. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
c. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
d. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

3. Computer Assisted Instruction

Activity	Benchmark	Standard	Application Level
a. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
b. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
c. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
d. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

4. Cross Disciplinary

Activity	Benchmark	Standard	Application Level
a. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
b. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
c. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
d. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

5. Miscellaneous

Activity	Benchmark	Standard	Application Level
a. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
b. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
c. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
d. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

E. Vocabulary

thrive
nutrients
non-living
human-created
naturally occurring
life processes
reproduce
eliminate waste
inherited
acquired
traits
resemble
species
transfer
offspring
compliment
utilize
germination
structures
adapted/adaptations
disperse
variations
life cycles
life span
repair
mature
maintenance
basic food supply
food chain
decomposers
energy source
manufacture
heat energy
pattern of behavior

F. References and Resources

Unit Four

Crayfish

A. Unit Benchmarks

At the end of this unit students will be able to;

1. Describe the characteristics of and variations between living and nonliving things.
   - Animals need air, water, and food in order to live and **thrive**.
2. Describe the life processes common to all living things.
   - Living things grow, take in nutrients, breathe, **reproduce, eliminate waste**, and die.
3. Describe how the structures of plants and animals compliment the environment of the plant or animal.
   - Each animal has different structures that serve different **functions** in **growth**, **survival**, and reproduction.
   - In order to survive in their environment, plants and animals must be **adapted** to that environment.
4. Observe that differences within a species may give individuals an advantage in surviving and reproducing.
   - Individuals within a species may compete each other for food, mates, space, water, and shelter in their environment.
   - All individuals have **variations**, and because of these variations, individuals of a species may have an **advantage** in surviving and reproducing.
5. Describe the basic life functions of common living specimens (e.g., guppies, mealworms, gerbils).
   - An **organism's external physical features** can enable it to carry out life functions in its particular environment.
6. Describe some survival behaviors of common living specimens.
   - Animals respond to change in their environment (e.g., **perspiration**, heart rate, breathing rate, eye blinking, **shivering** and **salivating**).
7. Describe how plants and animals, including humans, depend upon each other and the nonliving environment.
   - All animals depend on plants. Some animals (predators) eat other animals (prey).

B. Unit Assessment

C. Rubric

D. Activities

1. Teacher Constructed Activities:

Activity	Benchmark	Standard	Application Level
a. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
b. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
c. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
d. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	

Application Level:

1: Knowledge
2: Apply in Discipline
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

3: Apply Across Disciplines

2. Textbook with Teaching Strategies

Activity	Benchmark	Standard	Application Level
a. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
b. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
c. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
d. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

3. Computer Assisted Instruction

Activity	Benchmark	Standard	Application Level
a. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
b. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
c. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
d. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

4. Cross Disciplinary

Activity	Benchmark	Standard	Application Level
a. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
b. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
c. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
d. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

5. Miscellaneous

Activity	Benchmark	Standard	Application Level
a. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
b. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
c. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
d. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

E. Vocabulary

mass
weight
volume
temperature
magnetism/magnets
hand lenses
metric ruler
balances
circuit testers
graduated cylinders

F. References and Resources

Unit Five

Animal Study (Bones)

A. Unit Benchmarks

At the end of this unit students will be able to;

1. Describe how the structures of plants and animals compliment the environment of the plant or animal.
    - Each animal has different **structures** that serve different **functions** in **growth**, **survival**, and reproduction.
        - Wings, legs, or fins enable some animals to seek shelter and to escape **predators**.
        - The mouth, including teeth, jaws, and tongue, enables some animals to eat and drink.
        - Claws, shells, spines, feathers, fur, scales, and color of body covering enable them to **obtain** food.
    - In order to survive in their environment, plants and animals must be **adapted** to that environment.
        - Animal **adaptations** include: **coloration** for **warning** or **attraction**, **camouflage**, **defense mechanisms**, movement, **hibernation**, and migration.
2. Observe the differences within a species may give individuals an advantage in surviving and reproducing.
    - All individuals have **variations**, and because of these variations individuals of a species may have an **advantage** in surviving and reproducing.
3. Describe the basic **life functions** of common living **specimens** (e.g., guppies, mealworms, gerbils).
    - An **organism's external physical features** can enable it to carry out life functions in its particular environment.
4. Describe some survival behaviors of common living **specimens**.
    - Some animals, including humans, move from place to place to meet their needs.

B. Unit Assessment

C. Rubric

D. Activities

1. Teacher Constructed Activities:

Activity	Benchmark	Standard	Application Level
a. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
b. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
c. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
d. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

2. Textbook with Teaching Strategies

Activity	Benchmark	Standard	Application Level
a. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
b. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
c. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
d. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	

Application Level:

1: Knowledge
2: Apply in Discipline
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

3: Apply Across Disciplines

3. Computer Assisted Instruction

Activity	Benchmark	Standard	Application Level
a. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
b. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
c. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
d. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	

Application Level:

1: Knowledge
2: Apply in Discipline
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

3: Apply Across Disciplines

4. Cross Disciplinary

Activity	Benchmark	Standard	Application Level
a. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
b. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
c. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
d. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	

Application Level:

1: Knowledge
2: Apply in Discipline
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

3: Apply Across Disciplines

5. Miscellaneous

Activity	Benchmark	Standard	Application Level
a. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
b. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
c. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
d. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	

Application Level:

1: Knowledge
2: Apply in Discipline
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

3: Apply Across Disciplines

E. Vocabulary

structures
functions
growth
survival
predators
obtain
adapted/adaptation
coloration
warning
attraction
camouflage
defense mechanisms
hibernation
variations
advantage
life functions
specimens
organism's external physical features

F. References and Resources

Unit Six

Measurement

A. Unit Benchmarks

At the end of this unit students will be able to;

1. Observe and describe properties of materials using appropriate tools.
   - Matter takes up space and has **mass (weight).** Two objects cannot occupy the same place at the same time.
   - Objects have properties that can be observed, described, and/or measured: length, width, **volume**, size, shape, mass or weight, **temperature**, texture, reflectiveness of light.
   - The material(s) an object is made up of determine some specific properties of the object (sink/float, conductivity, **magnetism**). Properties can be observed or measured with tools such as **hand lenses, metric rulers**, thermometers, **balances, magnets, circuit testers**, and **graduated cylinders.**

B. Unit Assessment

C. Rubric

D. Activities

1. Teacher Constructed Activities:

Activity	Benchmark	Standard	Application Level
a. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
b. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
c. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
d. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

2. Textbook with Teaching Strategies

Activity	Benchmark	Standard	Application Level
a. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
b. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
c. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
d. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

3. Computer Assisted Instruction

Activity	Benchmark	Standard	Application Level
a. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
b. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
c. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
d. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

4. Cross Disciplinary

Activity	Benchmark	Standard	Application Level
a. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
b. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
c. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
d. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

5. Miscellaneous

Activity	Benchmark	Standard	Application Level
a. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
b. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
c. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
d. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

E. Vocabulary

mass
weight
volume
temperature
magnetism/magnets
hand lenses
metric ruler
balances
circuit testers
graduated cylinders

F. References and Resources

Unit Seven

Colored Solutions

A. Unit Benchmarks

At the end of this unit students will be able to;

1. Observe and describe properties of materials using appropriate tools.
   - Matter takes up space and has **mass** (weight).
   - **Matter** has properties that can be observed through the senses.
   - Objects have **properties** that can be observed, described, and/or measured.
   - The material(s) an object is made up of determine some specific properties of the object (i.e. sink/float). Properties can be observed with tools such as **graduated cylinders**.

B. Unit Assessment

C. Rubric

D. Activities

1. Teacher Constructed Activities:

Activity	Benchmark	Standard	Application Level
a. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
b. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
c. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
d. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

2. Textbook with Teaching Strategies

Activity	Benchmark	Standard	Application Level
a. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
b. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
c. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
d. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

3. Computer Assisted Instruction

Activity	Benchmark	Standard	Application Level
a. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
b. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
c. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
d. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

4. Cross Disciplinary

Activity	Benchmark	Standard	Application Level
a. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
b. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
c. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
d. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

5. Miscellaneous

Activity	Benchmark	Standard	Application Level
a. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
b. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
c. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	
d. *Materials:*		HPEHE: MST: ELA: Arts: LOTE: CDOS: SS:	

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

E. Vocabulary

mass
density
matter
properties
graduated cylinders

F. References and Resources

X. Course Assessment

XI. Curriculum Review Process