COURSE: Science	**GRADE(S):** Kindergarten

UNIT 1: Introduction and Inquiry Skills (Inquiry skills are to be integrated into all unit of science instruction)

SCIENCE THEMES: Systems and interactions, models, patterns of change, change over time.

PROCESS SKILLS: Observing, classifying, analyzing, and interpreting data, formulating hypotheses, predicting, experimenting/testing, variable recognition and control.

STATE STANDARDS:

3.2 Inquiry and Design

3.2. A. Develop an awareness of the importance of language to communicate an idea.
- Use oral language to describe observations.

3.2. B. Develop an awareness of the five senses.
- Use the five senses to gather information about objects.

3.2. C. Develop an awareness of the scientific method.
- Generate questions that could start an investigation.
- Participate in simple guided experiments.

3.2. D. Develop an awareness of problem solving.
- Discuss possible solutions to a given problem.

Key Concepts:

Scientists use process skills to help them do research. A process is a way of doing things. Scientists also use their five senses to observe and to find out about objects, events, and living things.

OBJECTIVES and ESSENTIAL KNOWLEDGE

1. Build an introductory vocabulary of scientific terms and use observation to develop a descriptive vocabulary based on sensory experiences.
   - Use vocabulary when answering and posing questions.
   - Write vocabulary on cards to be hung in classroom near science corner.
   - Model new vocabulary where appropriate to extend children's observations ("That tree bark feels scratchy. Why do you think it feels rough?").
   - Use scientific talk to support children's thinking.
2. Form clear explanations based on observation and participation in common experiments.
   - Provide many opportunities for sensory exploration.
   - Design, implement and discuss scientific investigations.
3. Use the five senses as tools with which to: observe, collect information, classify, describe and connect known ideas with new knowledge to build understanding or refine concepts.
   - Provide opportunities to observe and explore.
4. Distinguish between scientific fact and a belief through literature.
   - Provide connections with literature.
   - Compare and contrast materials.
5. Demonstrate willingness to modify explanations based on experience or observations.
   - Set a clear focus for inquiry.
   - Recognize opportunities for problem solving by raising questions.
6. Demonstrate understanding of the process of scientific inquiry by:
   - Asking relevant questions.
   - Making predictions based on experience or observation.
   - Identify and explain basic problems.
   - Identify possible solutions.

- Test out solutions.
- Record steps taken.
- Record results.

ACTIVITIES:

The learner will:

1. Observe and participate in simple experiments.
2. Ask questions about their observations.
3. Predict what might happen next.
4. Record results of experiments or observations using charts, graphs or journals.
5. Share conclusions and explanations with other students.
6. Respond to "what if" questions.
7. Identify the many ways senses are used.
8. Identify common items using their senses.
9. Use vocabulary to describe the degrees of similarities and difference based on the use of the five senses.
10. Explore objects, materials and events by acting upon them and noticing what happens.
11. Describe, compare, sort, and classify observable characteristics and properties.
12. Record observations, explanations and ideas through multiple forms of representation including drawing, simple graphs, writing and movement.
13. Listen to others with different perspectives.
14. Work collaboratively.
15. Identify a problem to be solved, pose possible solutions and test them.
16. Record steps taken to solve the problem using multiple forms of representations including drawing, writing and movement or by discussion with teacher assistance for charting.
17. Draw conclusions from results.

RESOURCES:

Harcourt Science Program
Non-fiction Trade books

ASSESSMENTS:

Classroom Participation
Completion of Activities

REMEDIATION:

One on One Instruction

ENRICHMENT:

COURSE: Science	**GRADE(S):** Kindergarten
UNIT 2: Biology/Life Science	

SCIENCE THEMES: Systems and interactions, models, patterns of change, change over time.

PROCESS SKILLS: Observing, classifying, analyzing, and interpreting data, formulating hypotheses, predicting, experimenting/testing, variable recognition and control.

STATE STANDARDS:
3.3 Biological Sciences

3.1.K.A1. Identify the similarities and differences of living and nonliving things.
- Be aware that plants and animals grow and change.

3.1.K.A3. Observe, compare, and describe stages of life cycles for plants and/or animals.

3.1.K.A5. Observe and describe structures and behaviors of a variety of common animals.

3.1.K.C2. Describe changes animals and plants undergo throughout the seasons.

3.3. C. Recognize the resemblance between parents and their offspring in a variety of living things.
- Match animal offspring to their correct parent.
- Describe similarities and differenced in the offspring of animals.

Key Concepts:
- Living things need food to grow and reproduce.
- An object that cannot eat, make food, move or respond on its own, grow and reproduce is not called a living thing.
- Plants and animals live in habitats.
- Habitats are places where living things live and grow and where plants and animals get everything they need to live.
- A living thing has parts (structures) and habits that may help it survive in its habitat.

OBJECTIVES and ESSENTIAL KNOWLEDGE

1. Identify the similarities and differences of living things and demonstrate a basic understanding of similarities and differences that relate to environmental habitat.
   - Provide samples of living things for students to investigate (butterfly garden, worm farm, bird feeder outside).
   - Utilize local resources to broaden children's knowledge of living things, their habitats, and characteristics.
2. Identify and record the life processes of living things and describe changes in living things over time.
   - Provide illustrations to demonstrate changes in life process.
3. Sort organisms according to their shared characteristics and know that some organisms have similar external characteristics.
   - Utilize local resources to broaden children's knowledge of living things, their habitats, and characteristics.
   - Use a Venn Diagram to sort animal habitats or characteristics
4. Describe basic needs of plants and animals.
   - Engage children in studying the needs of living things through growing plants, or taking care of animals.
5. Understand that living things are made up of parts that have specific functions.

- Provide opportunities for exploration of parts of plants.
- Use diagrams to demonstrate the parts of plants, animals, human body.
- Provide nonfiction texts for students to explore parts of living things.

6. Explore characteristics that can be inherited.
   - Provide pictures of adults and their offspring for identification of inherited physical characteristics.
7. Identify characteristics for animal and plant survival identified with seasonal changes.
   - Provide opportunities for children to observe plants and animals over time during seasonal change.
   - Provide ways for children to document their observations.
   - Provide nonfiction text to illustrate concept of change over time.

ACTIVITIES:

The learner will:

1. Observe and document the growth of a living thing through drawings, writing, and/or photos.
2. Explore the life process of living things (butterflies, frogs).
3. Sort animals according to their coverings (fur, feathers, scales).
4. Sort animals according to their habitats (air, land, water).
5. Identify the basic needs necessary for plants and animals to survive.
6. Classify animals by their common external characteristics.
7. Investigate the parts of plants.
8. Describe through writing, drawing or identifying pictures.
9. Investigate parts of insects.
10. Determine how the parts make things Function (human body).
11. Identify physical characteristics that appear in parents and their off-spring using pictures.
12. Document by drawing changes over time of trees or plants.
13. Observe the behavior of local animals as they prepare for changes in seasons (rabbits, squirrels, birds).
14. Observe living things over different time periods (a week, a month, seasons).
15. Document the changes from observations by drawing, writing or in photographs.
16. Recognize from illustrations the process (sequence) of changes in some living things (butterfly, frog, plants from bulbs or seeds).

RESOURCES:

Harcourt Science Program
Non-fiction Trade books

ASSESSMENTS:

Classroom Participation
Completion of Activities

REMEDIATION:

One on One Instruction

ENRICHMENT:

COURSE: Science	**GRADE(S):** Kindergarten
UNIT 3: Earth Science	

SCIENCE THEMES: Systems and interactions, models, patterns of change, change over time.

PROCESS SKILLS: Observing, classifying, analyzing, and interpreting data, formulating hypotheses, predicting, experimenting/testing, variable recognition and control.

STATE STANDARDS:
3.5 Earth Sciences

3.3.1.A1. Observe, describe, and sort earth materials.
- Compare the composition of different soils

3.3.1.A4. Identify and describe types of fresh and salt-water bodies (ocean, rivers, lakes, ponds).

3.3.1.A5. Become familiar with weather instruments.
- Collect, describe, and record basic information about weather over time.
- Observe and describe weather.
- Construct simple graphs (i.e., pictographs) of daily weather.

3.3.1.B1. Explain why shadows fall in different places at different times of the day.

Key Concepts:
- Land, water, and air are important because they are natural resources, parts of Earth used by living things. Land and water make up the surface of Earth. Plains and hills are kinds of land. Rivers and lakes are kinds of water. Land and water are natural resources. Rocks and soil are natural resources, too. Natural resources are things from the Earth that we use.
- There are patterns in weather. Changes in the weather occur daily. The four seasons form a pattern. Weather conditions change seasonally.

OBJECTIVES and ESSENTIAL KNOWLEDGE

1. Distinguish between three types of earth: soil, rock and sand.
   - Rocks are nonliving things that come from the Earth.
   - Boulders and sand are examples of different kinds of rocks based on size.
   - Rocks are natural resources, useful things that come from nature.
   - Soil is a natural resource which may have sand, clay and humus in it.
   - Plants live and grow in soil. Some animals live in soil.
2. Recognize that there is more water than land on Earth. Streams, rivers, lakes and oceans are examples of water found on Earth.
   - A stream is a small body of fresh water that may begin in mountains. The water flows downhill. Streams may flow together into a river.
   - A river is a large body of moving fresh water which may flow into lakes and oceans.
   - A lake is a still body of fresh or salt water with land all around it.
   - An ocean is a large body of salty water. Most of Earth's water is in oceans.
3. Identify what makes up weather and how it changes from day to day.
   - Weather is what it is like outside.(wet, dry, cloudy, sunny, windy or still).
   - Weather often changes from day to day.
4. Use simple tools to measure weather conditions.
   - Temperature is how hot or cold something is.
   - A thermometer measures temperature, a wind vane indicates direction of the wind and a rain gauge measures rainfall
5. Recognize seasonal patterns in weather.

- A season is a time of year.
- The four seasons are spring, summer, fall and winter.
- The weather may change from season to season.

ACTIVITIES:

The learner will:

1. Identify and use books that show the appropriate land forms and draw the children's attention to these concepts.
2. Take the children on a walk or field trip to experience these landforms.
3. Provide children with paper-mache and other art materials to create a model of these land forms.
4. Explore soil, sand and different rock types
5. Take the children on a dig for soil samples and observe what is in the soil (worms, leaves, rocks, etc.).
6. Compare and contrast various rock samples
7. Observe and identify daily weather conditions — sunny, rainy, cloudy, snowy, windy, warm, hot, cool, and cold.
8. Predict daily weather based on basic observable conditions.
9. Chart daily weather conditions.
10. Discuss the weather as it pertains to meaningful events such as going outside for recess, going on a fieldtrip, conduct an experiment that requires sunlight, wind, etc.
11. Create a mural using different art materials to illustrate the different types of precipitation.
12. Conduct an experiment using a rain gauge or other water collecting device to discover the difference between drizzle, rain, pouring, etc.
13. Sort pictures of activities, clothing and toys according to the types of weather and season they would most closely be linked to (a kite would go with wind, an umbrella with rain, sunglasses with sun).
14. Create a seasonal collage or booklet.
15. Conduct an experiment using thermometers to explore the temperatures of liquids found throughout the school grounds (water from a fountain, the milk in a refrigerator, water from a puddle, paint at the art easel).
16. Identify streams, lakes, rivers, and oceans on a picture, map or globe in a learning station activity.

RESOURCES:

Harcourt Science Program
Non-fiction Trade books

ASSESSMENTS:

Classroom Participation
Completion of Activities

REMEDIATION:

One on One Instruction

ENRICHMENT:

COURSE: Science	**GRADE(S):** Kindergarten
UNIT 4: Physical Science	

SCIENCE THEMES: Systems and interactions, models, patterns of change, change over time.

PROCESS SKILLS: Observing, classifying, analyzing, and interpreting data, formulating hypotheses, predicting, experimenting/testing, variable recognition and control.

STATE STANDARDS:

3.4 Physical Science, Chemistry and Physics

3.2.K.A5. Recognize that everything is made of matter.

3.2.K.A3. Describe the way matter can change.

3.2.K.A1. Identify and classify objects by observable properties of matter.
- Compare different kinds of materials and discuss their uses.

3.2.K.B6. Recognize that light from the sun is an important source of energy for living and nonliving systems and some source of energy is needed for all organisms to stay alive and grow.

3.4. C. Observe and describe different types of motion.
- Follow oral directions such as right, left, forward and backward.
- Discuss types of motion (moving in circle vs. a straight line).

Key Concepts:
- All objects have physical properties, which include color, shape or form, texture, and size.
- Position and speed, though not physical properties, can also be observed and described.
- A basic understanding of physical properties provides a foundation for observing, investigating, and studying matter. It is intended that students will actively develop scientific investigation, reasoning, and logic skills in the context of the key concepts presented in this unit.
- Energy can change things. Light is a form of energy. Light from the Sun heats the land, water and air. Electricity can travel through power lines. Food and fuel can also provide energy. People and animals use the energy in food for all their activities.

OBJECTIVES and ESSENTIAL KNOWLEDGE

1. Explain how an object may have many properties that can be observed and described.
   - Physical properties include: Colors, shapes, textures, relative size, weight, and position
   - Different objects can have some of the same physical properties and some different physical properties.
2. Describe objects readily in terms of color, shape, and texture.
   - Colors (red, orange, yellow, green, blue, purple), white, and black.
   - Shapes (circle, triangle, square, and rectangle) and forms (flexible/stiff, straight/curved).
   - Textures (rough/smooth) and feel (hard/soft).
3. Recognize that an object can be described according to its position relative to another object and according to its motion.
   - Relative size and weight (big/little, large/small, heavy/light, wide/thin, long/short).
   - Position (over/under, in/out, above/below, left/right) and speed (fast/slow).
4. Identify examples of the different states of water (solid, liquid, and gas).
   - Water can be a solid (ice), liquid, or gas (steam).
   - Recognize that the state of water can be changed by heating or cooling it.

5. Explore basic energy types and sources.
    - Heat, light, and sound are forms of energy.
    - Heat and Light come from a variety of sources.
    - The Sun is an important source of energy.
6. Explore variations of sound
    - When a sound is made, something vibrates.
    - An object moves back and forth when it vibrates.
    - Vibrations cause sound.
    - Sounds come from common sources.

ACTIVITIES:

The learner will:

1. Identify and name eight basic colors, including red, orange, yellow, green, blue, and purple. (Indigo and violet are not required at the kindergarten level.) Black and white are not spectral colors, but students should recognize them by name.
2. Identify and name a circle, triangle, square, and rectangle.
3. Compare and contrast objects that are flexible, stiff, straight, and curved.
4. Compare and contrast objects that are rough, smooth, hard, and soft.
5. Compare objects using the concepts of heavy/light, long/short, wide/thin, big/little, and large/small.
6. Measure objects, using nonstandard units.
7. Identify the position of an object, using position words over/under, in/out, above/below, and left/right.
8. Group objects according to their speed (fast or slow).
9. Classify examples of different states of matter as solid, liquid, or gas.
10. Identify what creates various sounds.
11. Identify energy sources in given pictures.
12. Create an instrument that can be used to make sound (drum).
13. Name sources of light and heat and describe ways that the light and heat from these sources are used.
14. Create a graphic organizer to list sources of energy.

RESOURCES:

Harcourt Science Program
Non-fiction Trade books

ASSESSMENTS:

Classroom Participation
Completion of Activities

REMEDIATION:

One on One Instruction

ENRICHMENT: