Science
Grade Two
2006

COURSE DESCRIPTION: (The course description sets the parameters, scope and sequence for the course):

I. **Earth and Space Science**

A. Properties of Earth

1. Explore how the materials that make up the Earth are formed; rocks, minerals, soils, fossils
2. Understand the properties of Earth's materials
3. Understand the properties of soil

B. Natural Resources

1. Understand that air, water, and soil are natural resources
2. Understand the natural that resources are used to make additional resources, such as fuel or food
3. Identify natural resources of water
4. Describe how water can be used in both domestic and public capacities
5. Understand that natural resources cannot always be renewed and need to be conserved
6. Identify techniques for conserving natural resources

C. Weather

1. Gather and record weather data. Use the data to identify weather conditions and understand how those conditions affect real world situations
2. Understand that weather changes daily
3. Describe weather by temperature, wind direction, wind speed, and precipitation
4. Describe how weather instruments are used to predict and record the weather

D. Instruments: Maps and Globes

1. Identify and use various kinds of maps

II. Life Science

A. Living Things

1. Investigate the interaction between living things and their environment
2. Compare and contrast living and non-living things
3. Demonstrate that living things have different levels of organization
4. Understanding the lifecycle process: birth, development into adults, reproduction, and death

5. Understanding that living things have different structures that serve different functions

B. Organisms
   1. Develop an understanding of organisms and the environments in which they live
   2. Understand the basic needs an organism requires for survival
   3. Classify organisms according to the function they serve in the food chain
   4. Classify organisms

C. Fossils
   1. Explore how fossils reveal the development of life over time
   2. Describe how fossils provide evidence about plants and animals

D. Environment
   1. Understand that an environment is the space, conditions, and factors that affect a species survival and quality of life
   2. Understand that there are many different environments
   3. Understand changes in environments
   4. Understand that humans alter the environment both positively and negatively for themselves and other organisms

E. Animals
   1. Demonstrate that animals are composed of different parts that serve different purposes
   2. Demonstrate how the different parts of animals work together for the well being of the organism
   3. Identify the external features of animals that help them survive in various habitats

F. Plants
   1. Demonstrate that plants are composed of different parts that serve different purposes
   2. Demonstrate how the different parts of plants work together for the well being of the organism
   3. Identify the external features of plants that help them survive in various habitats

G. Animals and Plants
   1. Understand the diversity of animals and plants
   2. Understand that plants and animals depend on each other for survival

3. Understand that within every species there are individuals

III. Physical Science

A. Objects
   1. Explore the relationship between the action applied to an object and the subsequent change to the object. For example, a balloon will expand when it is filled with air
   2. Begin to understand to position of objects

B. Motion
   1. Begin to understand the motion of objects
   2. Demonstrate how an object's motion can vary in direction and speed
   3. Demonstrate that pushing or pulling an object can change the motion and position of that object
   4. Investigate the concept of motion relative to change of position

C. Light
   1. Develop an understanding of light
   2. Explore sources of light
   3. Understand that light travels in a straight line until it reaches an object
   4. Perform experiments to better understand how light travels
   5. Understand that an object can absorb light
   6. Describe what occurs when light contacts an object

D. Heat
   1. Explore sources of heat
   2. Develop an understanding of heat.
   3. Understand that different objects and processes produce heat
   4. Demonstrate how heat can be transferred from one place to another

E. Electricity
   1. Develop an understanding of electricity
   2. Understand that in order for electricity to travel, the electrical circuit must have a complete loop
   3. Understand that light, heat, sound and magnetism can be produced by the electricity in circuits

F. Magnetism: Properties
   1. Develop an understanding of magnetism
   2. Understand that magnets attract and repel other magnets, as well as some other types of materials

3. Predict the results of a scientific investigation involving a magnet

G. Forces
   1. Understand that some forces are invisible
   2. Understand that some forces can act at a distance
   3. Describe how force effects the speed of an object
   4. Identify the forces that cause objects to change direction

H. Sound
   1. Demonstrate how vibrating objects produce sound
   2. Understand that the pitch of a sound can be altered by changing the rate of vibration

CORE CURRICULUM CONTENT STANDARDS:

Standard 5.1 (Scientific Processes) all students will develop problem-solving, decision-making and inquiry skills, reflected by formulating usable questions and hypotheses, planning experiments, conducting systematic observations, interpreting and analyzing data, drawing conclusions, and communicating results.

Standard 5.2 (Science and Society) all students will develop an understanding of how people of various cultures have contributed to the advancement of science and technology, and how major discoveries and events have advanced science and technology.

Standard 5.3 (Mathematical Applications) all students will integrate mathematics as a tool for problem solving in science, and as a means of expressing and/or modeling scientific theories.

Standard 5.4 (Nature and Process of Technology) all students will understand the interrelationships between science and technology and develop a conceptual understanding of the nature and process of technology.

Standard 5.5 (Characteristics of Life) All students will gain an understanding of the structure, characteristics, and basic needs of organisms and will investigate the diversity of life.

Standard 5.6 (Chemistry) all students will gain an understanding of the structure and behavior of matter.

Standard 5.7 (Physics) all students will gain an understanding of natural laws as they apply to motion, forces, and energy transformations.

Standard 5.8 (Earth Science) all students will gain an understanding of the Earth structure, dynamics, and geophysical systems of the Earth.

Standard 5.9 (Astronomy and Space Science) All students will gain an understanding of the origin, evolution, and structure of the universe.

Standard 5.10 (Environmental Studies) all students will develop an understanding of the environment as a system of interdependent components affected by human activity and natural phenomena.

CUMULATIVE PROGRESS INDICATORS:

Standard 5.1
A. Habits of Mind
1. Raise questions about the world around them and be willing to seek answers through making careful observations and experimentation
2. Keep records that describe observations, carefully distinguish actual observations from ideas and speculations, and are understandable weeks and months later
3. Recognize that when a science investigation is replicated, very similar results are expected
4. Know that when solving a problem it is important to plan and get ideas and help from other people
B. Inquiry and Problem Solving
1. Develop strategies and skills for information–gathering and problem-solving, using appropriate tools and technologies
2. Identify the evidence used in an explanation
C. Safety
1. Recognize that conducting science activities requires an awareness of potential hazards and the need for safe practices
2. Understand and practice safety procedures for conducting science investigations

Standard 5.2
A. Cultural Contributions
1. Describe how people in different cultures have made and continue to make contributions to science and technology.
B. Historical Perspectives
1. Hear, read, write, and talk about scientists and inventors in historical context.

Standard 5.3
A. Numerical Operations
1. Determine the reasonableness of estimates, measurements, and computations of quantities when doing science.

2. Recognize and comprehend the orders of magnitude associated with large and small physical quantities.
3. Express quantities using appropriate number formats, such as:
    - integers.
    - fractions.

B. Geometry and Measurement

1. Select appropriate measuring instruments based on the degree of precision required.
2. Use a variety of measuring instruments and record measured quantities using the appropriate units.

C. Patterns and Algebra

1. Identify patterns when observing the natural and constructed world.

D. Data Analysis and Probability

1. Use tables and graphs to represent and interpret data.

Standard 5.4

A. Science and Technology

1. Indicators for this strand are introduced at a higher-grade level.

B. Nature of Technology

1. Select and use simple tools and materials to complete a task.

C. Technological Design

1. Make a plan in order to design a solution to a problem.
2. Describe a toy or other familiar object as a system with parts that work together.

Standard 5.5

A. Matter, Energy and Organization in Living Systems

1. Investigate the basic needs of humans and other organisms.
2. Compare and contrast essential characteristics that distinguish living things from nonliving things.

B. Diversity and Biological Evolution

1. Recognize that different types of plants and animals live in different parts of the world.
2. Recognize that some kinds of organisms that once lived on earth have completely disappeared.

C. Reproduction and Heredity

1. Recognize that humans and other organisms resemble their parents.

Standard 5.6

A. Structure and Properties of Matter

1. Sort objects according to the materials from which they are made or their physical properties, and give a rationale for sorting.
2. Use magnifiers to observe materials, then draw and describe what more can be seen using the tools.

3. Observe that water can be a liquid or a solid and can change from one form to the other.

B. Chemical Reactions

1. Indicators for this strand are introduced at a higher-grade level.

Standard 5.7

A. Motion and Forces

1. Distinguish among the different ways objects can move such as:
    - fast and slow.
    - in a straight line.
    - in a circular path.
    - back and forth.

2. Show that the position and motion of an object can be changed by pushing or pulling the object.

B. Energy Transformations

1. Demonstrate that sound can be produced by vibrating objects

Standard 5.8

A. Earth's Properties and Materials

1. Observe and describe rocks and soil.

B. Atmosphere and Water

1. Identify the sources and uses of water.
2. Recognize that water can disappear (evaporate) and collect on cold surfaces (condense).
3. Describe current weather conditions and recognize how those conditions affect our daily lives.
4. Describe daily and seasonal changes and patterns in the weather.

C. Processes that Shape the Earth

Indicators for this strand are introduced at a higher-grade level.

D. How We Study the Earth

1. Record observations that describe the features of the natural world in their local environment.

Standard 5.9

A. Earth, Moon, Sun System

1. Recognize that the sun supplies light and heat to the Earth.
2. Observe the patterns of day and night and the movements of the shadows of an object on the Earth during the course of a day.

B. Solar System

1. Recognize that the sun can only be seen during the day, but the moon can be seen sometimes at night and sometimes during the day.

C. Stars

1. Observe that stars are many, scattered, and different in brightness.

2. Observe that the position of the stars, with respect to each other (constellations) is unchanging.

D. Galaxies and Universe

Indicators for this strand are introduced at a higher-grade level.

Standard 5.10

A. Natural Systems and Interactions

1. Associate organisms' basic needs with how they meet those needs within their surroundings.

B. Human Interactions and Impact

1. Identify various needs of humans that are supplied by the natural or constructed environment.

SUGGESTED ACTIVITIES THAT ADDRESS THESE STANDARDS MAY INCLUDE BUT ARE NOT LIMITED TO:

Standard 5.1

- Button Observation/Classification
- Leaf Classification Graph/Measurement
- Bubble Experiment

Standard 5.2

- Biography Projects
- United Streaming Video Clips
- *So You Want to Be An Inventor* Activity

Standard 5.3

- Temperature Graph
- Leaf Classification Graph/Measurement
- Human Body Measurement Project

Standard 4

- Science Fair Projects
- Inventors Project

Standard 5

- Lifecycles
- Food Pyramid
- Habitat Themes

Standard 6

- Finger Print Experiment
- Ice Experiment
- “Goop” Experiment

Standard 7

- Airplane Experiment
- Moving Molecules

Standard 8

- Daily Weather Graph
- Salt Water Evaporation Experiment
- Season Observation Journal

Standard 9

- Somewhere in the Universe booklets
- Flashlight Activity (representing the sun)
- Food Chain Activity

Standard 10

- Food Chain Activity
- Wants and Needs Chart

INSTRUCTIONAL STRATEGIES:

- Direct Instruction
- Cooperative Learning
- Team Learning
- Reciprocal Style Learning

EVALUATION/ASSESSMENT OF STUDENTS:

- Tests/Quizzes
- Projects
- In-Class Assignments

EVALUATION/ASSESSMENT OF CURRICULUM:

RESOURCES/BIBLIOGRAPHY:

Course Book: *Science* Silver Burdett & Ginn 1989 Morristown, NJ

Teacher Supplements:

- Charlesworth, L. *Dinosaurs*. Professional Scholastic Books. 1995 New York, NY ISBN: 0590494120
- *Science Made Simple Grades 1-3*. Educational Center, Inc. 1997 ISBN: 1562341839
- Prior, Jennifer Overend. *Magnets*. Teacher Created Materials, Inc. 2000. ISBN: 151609377X
- *Beyond Books-Teacher Door* www.beyondbooks.com/bbteacher/corr/sc_nj.asp
- *United Streaming* www.unitedstreaming.com