Toms River Regional Schools
Course Proficiency Outline
Science – Grade 6 – Pinnacle

PURPOSE:

The Pinnacle program provides enrichment activities and aims to improve scientific and analytical thinking skills through these activities. One such activity is the completion of an individual science research project. Completion of this project is required for students in the Pinnacle program. Entry of the project into the school science fair is not required, but is highly recommended. A variety of additional projects and assignments are also offered to allow students in this program to express their creativity and explore their interest in science.

The sixth grade science program focuses on a broad range of science skills in understanding the natural world. The curriculum integrates all the natural sciences so students can appreciate the ideas that unify and make the connections between these ideas and concepts.

Students will experience the richness and excitement of scientific discovery of the natural world through investigating phenomena and applying scientific concepts, skills, and processes to everyday experiences. The aim of the program is to help students develop scientific dispositions and habits of mind including curiosity, demand for verification, respect for logic and rational thinking, attention to accuracy, precision and patience. Making detailed observations, drawing conclusions, and recognizing unusual or unexpected data are skills needed to be able to use and validate information. The science curriculum heightens critical thinking skills by providing opportunities for students to make generalizations, evaluate and apply information, and solve problems by asking appropriate questions. Utilizing scientific methodology is strongly reinforced.

Standards

The New Jersey core curriculum standards for science reflect the belief that all students can and must learn enough science to assume their role as concerned citizens equipped with necessary information and decision-making skills. To that end, the Department of Education has set the following standards for all students in the New Jersey.

5.1 Scientific Processes

A. Habits of Mind

B. Inquiry and Problem Solving

C. Safety

5.2 Science and Society

A. Cultural Contributions

B. Historical Perspectives

5.3 Mathematical Applications

A. Numerical Operations

B. Geometry and Measurement

C. Patterns and Algebra

D. Data Analysis and Probability

5.4 Nature and Process of Technology

A. Science and Technology

B. Nature of Technology

C. Technological Design

5.5 Life Science

A. Matter, Energy and Organization in Living Systems

B. Diversity and Biological Evolution

C. Reproduction and Heredity

5.6 Physical Science – Chemistry

A. Structure and Properties of Matter

B. Chemical Reactions

5.7 Physical Science – Physics

A. Motion and Forces

B. Energy Transformations

5.8 Earth Science

A. Earth's Properties and Materials

B. Atmosphere and Weather

C. Processes that Shape the Earth

D. How We Study the Earth

5.9 Astronomy and Space Science

A. Earth, Moon, Sun System

B. Solar System

C. Stars

D. Galaxies and Universe

5.10 Environmental Studies

A. Natural Systems and Interactions

B. Human Interactions and Impact

I. STUDENT OUTCOMES

A. Scientific Process (5.1, 5.2, 5.3, 5.4)

Students will:

1. Comprehend that most systems are components of larger systems. (5.1 A, B)
2. Understand how components of a system influence and interact with one another. (5.1 B)
3. Be able to collect and organize data to support the results of an experiment. (5.1 D, 5.1 B)
4. Be able to communicate experimental findings using words, charts, graphs, pictures and diagrams. (5.3 D)
5. Determine that scientific theories emerge over time and depend on the contributions of many people. (5.2 A, B)
6. Identify how people apply scientific knowledge using tools, technology, and other devices to solve problems. (5.4 A. B, C)
7. Grasp how science uses mathematics as a tool to determine 'c,' and support conclusions. (5.3 A, B C, D)

B. Life Science (5.5)

Students will:

1. Comprehend the similarities, differences, interdependencies, and basic structures of living things. (5.5 A)
2. Discern the traits that distinguish living organisms from nonliving things. (5.5 C)
3. Recognize that organisms are made up of cells and have distinguishing characteristics. (5.5 A)
4. Identify the five kingdoms of living things and understand how a classification system allows scientists to communicate information. (5.5 B)

C. Physical Science (5.6, 5.7)

Students will:

1. Know that matter has physical and chemical properties. (5.6 A)
2. Recognize that matter can be transformed from one state to another. (5.6 A, B)
3. Understand that matter can be combined to form new substances with both chemical and physical properties that would be different from the original substances. (5.6 A, B)
4. Comprehend how the motion of an object is affected by one or more forces. (5.7 A)
5. Understand that energy exists in various forms, such as light, sound. (5.7 B)

D. Earth Science (5.8, 5.9, 5.10)

Students will:

1. Determine and evaluate the personal and societal activities on the local and global environment. 5.10 A, B
2. Understand the impact of the interaction of the Earth, the Moon and the Sun on the Earth. 5.9, A, B

E. Workplace Readiness/Study Skills

Students will:

1. Organize information by classifying, sequencing, making and using tables and graphs.
2. Interpret data using observation, inference, comparison and contrast, recognition of cause and effect.
3. Write, for a specific purpose, using complete, grammatically correct sentences with proper spelling and punctuation.
4. Work cooperatively with others to accomplish a task.
5. Appreciate how good work habits such as dependability, promptness, appropriate attitudes, and getting along with others are necessary for success in school or in the workplace.
6. Discover career opportunities available in the science area.

II. CONTENT

A. Scientific Process (5.1, 5.3, 5.4)

1. Observing
    a. Comparing and contrasting
    b. Recognizing cause and effect
2. Organizing and Communicating Information
    a. Classifying and sequencing
    b. Using tables, graphs, charts and journals
3. Practicing Scientific Process
    a. Forming a hypothesis
    b. Testing a hypothesis through experiment
    c. Representing and interpreting data

B. Life Science (5.2, 5.5, 5.10)

1. Describing the World
    a. What is the living world?
    b. Classification
    c. Modern classification
2. Animal Life
    a. What is an animal?
    b. Reproduction and development
    c. Stages of metamorphosis
    d. Adaptations for survival
3. Plant life
    a. What is a plant?
    b. Classifying plants

c. Plant reproduction
d. Plant processes (including photosynthesis and respiration)

4. Ecology
   a. Characteristics of an ecosystem
   b. Organisms in their environment
   c. How limiting factors affect organisms

C. Physical Science (5.6, 5.7)

1. Light and Vision
   a. The Nature of light
   b. Reflections and refractions
   c. Color
2. Sound and Hearing
   a. Sources of sound
   b. Frequency and pitch
   c. Music and resonance
3. Waves
   a. Waves and vibrations
   b. Characteristics of waves
   c. Adding waves
   d. Sound as waves
4. Describing the Physical World
   a. Composition of matter
   b. Describing matter
   c. Physical and chemical changes
   d. States of matter

D. Earth Science (5.8, 5.9)

1. Viewing Earth and Sky
   a. Viewing the Earth/landforms
   b. Using maps
   c. Viewing the sky
2. The Earth-Moon System
   a. Earth's Shape and Movement
   b. Motions of the Moon/Rotation and Revolution
   c. Tides

III. Activities and Materials

A. Texts: Prentice Hall Science Explorer 2009

- The Nature of Science and Technology
- Sound and Light
- Cells and Heredity
- Animals
- Bacteria to Plants
- Astronomy

B. Teacher Resources

1. Science Resource Kit
2. The Internet

3. Prentice Hall Teacher Express
4. Science Explorer Lab Activity DVDs
5. Prentice Hall Video Explorations
6. Prentice Hall Success Net

C. Classwork
1. There will be lectures, discussions, cooperative work, note taking, audio-visual materials, and regular tests and quizzes.
2. There will be hands on laboratories and demonstrations.
3. General principles of career education, attitudes, work habits, and competencies, as well as information relating to careers in the sciences will be explored where appropriate.
4. Pinnacle students are expected to complete a science fair project. Participation in the school science fair is not mandatory, but it is highly recommended.

D. Assignments will be given related to lesson objectives. These assignments will be graded and reviewed by teachers and pupils.
E. Many of the seventh grade students will participate in science fairs.
F. Enrichment activities may include guest speakers, research projects, and other appropriate coursework as assigned.

IV. Evaluation

A. Students will bring needed materials to class and be ready to work.
B. Students will complete classwork and homework assignments in a timely fashion.
C. Students will be expected to complete assigned reports and/or projects as specified by the teacher.
D. Students will prepare adequately for and successfully complete quizzes, tests, and the final exam.
E. Students will be expected to participate in class.
F. The final grade represents the teacher's professional judgment of student performance. All of the items above are included in the final evaluation process.

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