

Toms River Regional Schools

Course Proficiency Outline

Science – Grade 7

The seventh 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.

I. 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

II. Content

- * - Indicates units not in the textbook.
- * - Measurement – Tools of Science (Standard 5.3)

A. Scientific Process (Standard 5.1)

- * - Lab Safety
- * - Science Fair
- 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. Physics (Standard 5.7)
1. Forces and Pressure
 - a. Force and Motion
 - b. How Forces Act on Objects
 - c. Pressure and Buoyancy
 2. Work and Energy
 - a. Work
 - b. Forms of Energy
 - c. Conservation of Energy
 3. Machines
 - a. Simple Machines
 - b. Mechanical Advantage
 - c. Using Machines
 4. Thermal Energy
 - a. Thermal Energy
 - b. Heat and Temperature
 - c. Making Heat Work
- C. Life Science (Standard 5.5)
1. Human Biology and Health
 - a. Bones, Muscles, Skin
 - b. Food and Digestion
 - c. Circulation
 - d. Respiration and Excretion
 - e. Fighting Disease
 - f. The Nervous System
 - g. The Endocrine System and Reproduction
- D. Earth Science (Standard 5.8 & Standard 5.7)
1. Forces in Earth
 - a. What Causes Earthquakes?
 - b. Shake and Quake
 - c. Volcanic Eruptions
 2. The Rock Cycle
 - a. Igneous Rocks
 - b. Metamorphic Rocks
 - c. Sedimentary Rocks
 3. The Ocean Floor and Shore Zones
 - a. Shore Zones
 - b. Humans Affect Shore Zones
 - c. The Ocean Floor

- E. Chemistry (Standard 5.6)
 - 1. Discovering Elements
 - a. Discovering Metals
 - b. Discovering Nonmetals
 - c. Understanding Metalloids

III. Activities and Materials

A. Text: Prentice hall Science Explorer 2009

- Inside Earth
- Earth's Changing Surface
- Earth's Waters
- Human Biology and Health
- Motion, Forces, and Energy

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.

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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