

**Toms River Regional Schools**  
**Course Proficiency Outline**  
**Science – Grade 8**

The eighth 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

- \*- Laboratory Safety (Standard 5.1)
- \* -Science Fair (Standard 5.1)
- \* -Measurement (Standard 5.3)
- 1. Structure of the Atom (Standard 5.6)
  - a. Early Discoveries
  - b. A Model of the Atom
- 2. The Periodic Table (Standard 5.6)
  - a. Structure of the Periodic Table
  - b. Families of Elements
  - c. Periods of Elements
- 3. Combining Atoms (Standard 5.6)
  - a. Kinds of Chemical Bonds
  - b. Balancing Chemical Equations
  - c. Chemical Reactions
- 4. Molecules in Motion (Standard 5.7)
  - a. Solids and Liquids
  - b. Kinetic Theory of Gases
- 5. Weather (Standard 5.8)
  - a. What is Weather?
  - b. Changes in Weather
  - c. Severe Weather
- 6. Ocean Water and Life (Standard 5.8)
  - a. Waves and Tides
  - b. The Origin and Composition of Oceans
  - c. Ocean Currents
- 7. Heredity (Standard 5.5)
  - a. How Organisms Get Their Traits
  - b. Mendel's Work Explained
  - c. Mendel's Work Refined
  - d. How Do Genes Control Traits?
- 8. Electricity (Standard 5.7)
  - a. Forces and Electrical Charges
  - b. Electrical Charge Carriers
  - c. Making Electricity Flow
  - d. Resistance, Current, and Voltage

9. Magnetism (Standard 5.7)
  - a. Forces and Fields
  - b. Magnets
  - c. Effects of Magnetic Fields
  - d. Producing Electric Currents
10. Environmental Science
  - a. Populations and Communities
  - b. Ecosystems and Biomes
  - c. Living Resources
  - d. Land, Water, and Air Resources
  - e. Energy Resources

### **III. Activities and Materials**

#### **A. Materials**

1. Text: Prentice hall Science Explorer 2009
  - Chemical Building Blocks
  - Chemical Interactions
  - Weather and Climate
  - Environmental Science
  - Electricity and Magnetism
2. Science Resource Kit
- 3 The Internet
4. Prentice Hall Teacher Express
5. Science Explorer Lab Activity DVDs
6. Prentice Hall Video Explorations
7. Prentice Hall Success Net

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

#### **C. Evaluation**

1. Students will bring needed materials to class and be ready to work.
2. Students will complete classwork and homework assignments in a timely fashion.
3. Students will be expected to complete assigned reports and/or projects as specified by the teacher.
4. Students will prepare adequately for and successfully complete quizzes, tests, and the final exam.
5. Students will be expected to participate in class.

6. 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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