

# 4<sup>th</sup> Grade Science Curriculum 2008

**Course Description:** There are four major areas of study in the fourth grade curriculum. The four major areas are life science, physical science, earth science, and the human body. In the fourth grade, the students will cover several topics within each major area to better enhance their knowledge of the fourth grade science curriculum. The order in which the teacher covers the four major areas depends on the teacher, but should take no longer than three months on each area to ensure adequate instructional time. The topics within each major area are as follows:

Major Area	Topic 1	Topic 2	Topic 3	Topic 4
Life Science	Plant Structure and Function	Animal Structure and Function	Energy in Ecosystems	Surviving in the Environment
Physical Science	Measuring Matter	Force and Motion	Electricity and Magnetism	Light and Sound
Earth Science	Measuring Weather	The Makeup of the Earth	Exploring the Oceans	Movements in the Solar System
Human Body	The Digestive System	The Circulatory System	The Nervous System	Keeping Your Body Systems Healthy

**Core Curriculum Content Standards:** The fourth grade core curriculum content standards are as follows:

- 5.1 – Scientific Processes
- 5.2 – Science and Society
- 5.3 – Mathematical Applications
- 5.4 – Nature and Process of Technology
- 5.5 – Life Science
- 8.1 – Computer and Information Literacy

**Cumulative Progress Indicators:** The fourth grade cumulative progress indicators are as follows:

**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.

**A. Habits of Mind**

1. Raise questions about the world around them and be willing to seek answers through making careful observations and experimentations.
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.

### **Instructional Strategies:**

1. The students will learn how to collect, organize, and record data through observations and experiments.
2. The students will learn the proper way to conduct an experiment using the scientific method.
3. The students will demonstrate the proper use of safety throughout all science experiments.

### **Assessment of Students:**

The students will be assessed through a variety of assessment resources.

- a. Completion of textbook readings and lesson review questions.
- b. Completion of lesson assessment workbook pages.
- c. Completion of chapter tests/exams.
- d. Written summaries of science experiments.
- e. Class participation, cooperation, and following of instructions.

**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.

#### **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.

### **Instructional Strategies:**

1. The students will learn about major events and people in history that have contributed to the advancement of science and technology.

### **Assessment of Students:**

The students will be assessed through a variety of assessment resources.

- a. Weekly readings of newspaper articles for current events.
- b. Research papers of individuals who have contributed to science and technology.
- c. Creation of individual inventions including a written essay.

**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.

#### **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.

### **Instructional Strategies:**

1. The students will learn the mathematical applications mentioned in the science core curriculum standards during math instructional time and will apply it to relevant science operations throughout the year.

### **Assessment of Students:**

The students will be assessed through a variety of assessment resources.

- a. Completion of workbook, textbook, and teacher made mathematical problems.
- b. Usage of appropriate measuring tools to measure objects in the classroom to master the units of measurement.
  - i. Ruler
  - ii. Meter Stick
  - iii. Yard Stick
- c. Collect and organize data to create bar graphs, pictographs, line plots, venn diagrams, and pie charts.

**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.

### **A. Science and Technology**

1. Distinguish between things that occur in nature and those that have been designed to solve human problems.

### **B. Nature of Technology**

1. Demonstrate how measuring instruments are used to gather information in order to design things that work properly.

### **C. Technological Design**

1. Describe a product or device in terms of the problem it solves or the need it meets.
2. Choose materials most suitable to make simple mechanical constructions.
3. Use the design process to identify a problem, look for ideas, and develop and share solutions with others.

### **Instructional Strategies:**

1. The students will understand how science and technology work together to solve real life problems through observing united streaming videos that entail how science and technology go hand and hand.

### **Assessment of Students:**

The students will be assessed through a variety of assessment resources.

- a. Completion of united streaming video review questions.
- b. Usage of measuring instruments to gather information in order to display data. For example, using a measuring cup to measure the amount of rain fall over a period of time and displaying the data in the form of a graph.

- c. Work in groups to design a product to solve a problem and share ideas, solutions, and conclusions within the group.
- d. Present the solutions in the form of a presentation using PowerPoint to the entire class.

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

**A. Matter, Energy, and Organization in Living Systems**

1. Identify the roles that organisms may serve in a food chain.
2. Differentiate between the needs of plants and those of animals.
3. Recognize that plants and animals are composed of different parts performing different functions and working together for the well being of the organism.
4. Describe the basic functions of the major systems of the human body including, but not limited to:
  - Digestive system
  - Circulatory system
  - Respiratory system
  - Nervous system
  - Skeletal system
  - Muscular system
  - Reproductive system

**B. Diversity and Biological Evolution**

1. Develop a simple classification scheme for grouping organisms.
2. Recognize that individuals vary within every species, including humans.

**C. Reproduction and Heredity**

1. Identify different stages in the lives of various organisms.

**Instructional Strategies:**

1. The students will learn the roles that serve in a food chain.
2. The students will understand the similarities and differences of plants and animals.
3. The students will learn how the human body functions and works.

**Assessment of Students:**

The students will be assessed through a variety of assessment resources.

- a. Draw food chains and food webs.
- b. Draw and label the different parts of plants and animals.
- c. Completion of textbook and workbook review questions.
- d. Create diagrams of the major systems that make up the human body.
- e. Charting information to classify groups of organisms and species.

**8.1 (Computer and Information Literacy):** All students will use computer applications to gather and organize information and to solve problems.

**A. Basic Computer Skills and Tools**

1. Use basic technology vocabulary.
2. Use basic features of an operating system (e.g., accessing programs, identifying and selecting a printer, finding help).
3. Input and access text and data, using appropriate keyboarding techniques or other input devices.
4. Produce a simple finished document using word processing software.
5. Produce and interpret a simple graph or chart by entering and editing data on a prepared spreadsheet template.
6. Create and present a multimedia presentation using appropriate software.

7. Create and maintain files and folders.
8. Use a graphic organizer.
9. Use basic computer icons.

## **B. Application of Productivity Tools**

- **Social Aspects**
  1. Discuss the common uses of computer applications and identify their advantages and disadvantages.
  2. Recognize and practice responsible social and ethical behaviors when using technology, and understand the consequences of inappropriate use including:
    - Internet access
    - Copyrighted materials
    - On-line library resources
    - Personal security and safety issues
  3. Practice appropriate Internet etiquette.
  4. Recognize the ethical and legal implications of plagiarism of copyrighted materials.
- **Information Access and Research**
  5. Recognize the need for accessing and using information.
  6. Identify and use web browsers, search engines, and directories to obtain information to solve real world problems.
  7. Locate specific information by searching a database.
  8. Recognize accuracy and/or bias of information.
- **Problem Solving and Decision Making**
  9. Solve problems individually and/or collaboratively using computer applications.
  10. Identify basic hardware problems and solve simple problems.

### **Instructional Strategies:**

1. The students will learn and become familiar with using a computer.
2. The students will learn how to use the different programs on a computer along with the vocabulary used when using a computer.
3. The students will explore how to use the computer through different search engines such as yahoo, google, and wikipedia.
4. The students will use the basic hardware, such as a calculator, to solve simple problems using the computer.

### **Assessment of Students:**

The students will be assessed through a variety of assessment resources.

- a. Logging in and out of the computer during computer lab scheduled periods.
- b. Log into Yearly Progress Pro and complete the activities assigned by both the teacher and computer program.
- c. Teacher observation while students are working in the computer lab on the computers.
- d. Usage of search engines to collect information for research papers.
- e. Completion of essays using Microsoft Word.
- f. Presentations using PowerPoint.
- g. Browsing and participation of educational computer games.

## **Resources/Bibliography**

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