

**Science for the Students with Multiple Disabilities**  
**(NEW JERSEY CORE STANDARDS for SCIENCE)**  
**August 15, 2003**

**COURSE DESCRIPTION:**

This course is designed for students who are academically challenged and in need of small group and individualized instruction. The learning challenges of the students require a course of study which departs from and replaces regular education curriculum, while affording the students an opportunity to earn credits to meet the graduation requirements as determined by the Hopatcong Schools and the NJ State Dept. of Education.

The students will participate in a course that offers information and skill development that will focus on functional science skills for daily living. Students will develop and apply practical knowledge, critical thinking, information literacy, understanding of the basic principals in the field of science and the scientific competence necessary to be contributing members of the school, local community.

**CUMULATIVE PROGRESS INDICATORS:** (Quoted from state document)

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

- I. Habit of Mind
  - A. Raise questions about the world around them and be willing to seek answers through making careful observation and experimentation.
  - B. Know that when solving a problem it is important to plan and get ideas and help from other people.
  - C. Communicate experimental findings to others.
- II. Inquiry and Problem Solving  
Develop strategies and skills for information-gathering and problem solving, using appropriate tools and technologies.
- III. Safety
  - A. Recognize that conducting science activities requires an awareness of potential hazards and the need for safe practices.
  - B. Understand and practice safety procedures for conducting science investigations.

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.

**Culture Contributions**

- Know that scientists are men and women of many cultures who often work together to solve scientific and technological problems.

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.

- I. Numerical Operation
  - A. Recognize and comprehend the orders of magnitude associated with large and small physical quantities.
  - B. Express quantities using appropriate number formats such as fractions.
- II. Geometry and Measurement
  - Use a variety of measuring instruments and record measured quantities using the appropriate units.
- III. Patterns and Algebra
  - Identify patterns when observing the natural and constructed world.

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

- I. Nature and Technology
  - Select and use simple tools and materials to complete a task.
- II. Technological Design
  - A. Describe a toy or other familiar object as a system with parts that work together.
  - B. Describe a product or devise in terms of the problem it solves or the need it meets.

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

- I. Matter, Energy, and Organization in Living Systems
  - A. Investigate the basic needs of human and other organisms.
  - B. Compare and contrast essential characteristics that distinguish living things from nonliving things.
  - C. Identify the roles that organisms may serve in a food chain.
  - D. Differentiate between the needs of plants and those of animals.
- I. Diversity and Biological Evolution
  - A. Develop a simple classification scheme for grouping organisms.
  - B. Recognize that individuals vary within every species, including humans.
  - C. Compare and contrast acquired and inherited characteristics in human and other species.
- II. Reproduction and Heredity
  - Identify different stages in the lives of various organisms.

Standard 5.6 (Chemistry) All students will gain an understanding of the structures and behaviors of matter.

- I. Structure and Properties of Matter
  - A. Sort objects according to the materials from which they are made or their physical properties, and give a rationale for sorting.

- B. Use magnifiers to observe materials, then draw and describe what more can be seen using the tools.
- C. Observe that water can be a liquid or a solid and can change form one form to the other.

II. Chemical Reactions

- Combine two or more materials and show that the new material may have properties that are different from the original material.

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

- Assisted and structured classroom based lab experiments which require data collecting and interpretation of information collected such as weather/climate, plant growth and maintenance and environmental/safety issues.
- Cooperative group activities to explore and document scientific process and information.
- Classroom demonstrations of information and concepts, class discussion.
- Reading and discussion of text materials
- Applied and practical information obtained and incorporated into daily living activities in the class, school and home setting from the web, media, and periodicals.

**INSTRUCTIONAL STRATEGIES:**

Direct individualized and small group instruction for teaching of basic science information

Multi - sensory science instruction

Strategy based problem solving skills

Review, repetition of functional literacy skills leading to mastery

Directly teach the sub-steps of the skill, model steps of skill, role-play and, or rehearse skill, transfer skill to real-life applications and settings.

Cooperative group learning tasks

Structured and scaffold class discussion

**EVALUATION/ASSESSMENT OF STUDENTS:**

- Portfolio Assessment
- Pre and Post-test of specific skills (criterion referenced)
- Inventories
- Structured observations
- Demonstration of target skills
- Tests and quizzes

## **EVALUATION/ASSESSMENT OF CURRICULUM:**

**This course of study will be evaluated/assessed by instructional staff during the first year of implementation for the purpose of necessary revision at the end of the first year. In addition, this course of study will be reviewed according to the Five-Year Curriculum Review schedule (see attached).**

## **RESOURCES/BIBLIOGRAPHY:**

Brolin, D. E. (1989) Life Centered Career Education: A competency Based Approach (3<sup>rd</sup> ed.). Reston, VA: The Council for Exceptional Children.

Bender, Michael (1996) A Functional Curriculum for Teaching Students with Disabilities (3<sup>rd</sup> ed.) Austin, TX: PRO-ED.

Dever, Richard B.; Knapczyk, Dennis (1997) Teaching Persons with Mental Retardation: A Model for Curriculum Development and Teaching. Madison WI: Brown and Benchmark Publishers.