



Active Chemistry Correlation to the New Jersey Core Curriculum Content Standards for Science

Correlation Key: "X" Coverage = Secondary concept of the activity or problem. Students gain a basic understanding or introduction of the concept.	<u><i>Movie Special Effects</i></u>	<u><i>Periodic Table</i></u>	<u><i>Cool Chemistry</i></u>
"XX" In-depth Coverage = Primary concept that is the focus of the activity or problem. Students gain thorough understanding of the concept.	Chapter 1	Chapter 2	Chapter 3

by the end of Grade 12, students will:

STANDARD 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. When making decisions, evaluate conclusions, weigh evidence, and recognize that arguments may not have equal merit.	XX	XX	XX
2. Assess the risks and benefits associated with alternative solutions.	XX	XX	XX
3. Engage in collaboration, peer review, and accurate reporting of findings.	XX	XX	XX
4. Explore cases that demonstrate the interdisciplinary nature of the scientific enterprise.	XX	XX	XX

B. Inquiry and Problem Solving

1. Select and use appropriate instrumentation to design and conduct investigations.	XX	XX	XX
2. Show that experimental results can lead to new questions and further investigations.	XX	XX	XX

C. Safety

1. Understand, evaluate and practice safe procedures for conducting science investigations.	XX	XX	XX
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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.

A. Cultural Contributions

1. Recognize the role of the scientific community in responding to changing social and political conditions and how scientific and technological achievement effect historical events.	X	XX	X
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B. Historical Perspectives

1. Examine the lives and contributions of important scientists who effected major breakthroughs in our understanding of the natural and designed world.	X	XX	XX
2. Discuss significant technological achievements in which science has played an important part as well as technological advances that have contributed directly to the advancement of scientific knowledge.	X	XX	XX
3. Describe the historical origin of important scientific developments such as atomic theory, genetics, plate tectonics, etc., showing how scientific theories develop, are tested, and can be replaced or modified in light of new information and improved investigative techniques.	X	XX	XX

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.

A. Numerical Operations



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1. Reinforce indicators from previous grade level.	XX	XX	XX
B. Geometry and Measurement			
1. When performing mathematical operations with measured quantities, express answers to reflect the degree of precision and accuracy of the input data.	XX	XX	XX
C. Patterns and Algebra			
1. Apply mathematical models that describe physical phenomena to predict real world events.	XX	XX	XX
D. Data Analysis and Probability			
1. Construct and interpret graphs of data to represent inverse and non-linear relationships, and statistical distributions.	X	XX	XX
STANDARD 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. Know that scientific inquiry is driven by the desire to understand the natural world and seeks to answer questions that may or may not directly influence humans, while technology is driven by the need to meet human needs and solve human problems.	XX	XX	XX
B. Nature of Technology			
1. Assess the impacts of introducing a new technology in terms of alternative solutions, costs, tradeoffs, risks, benefits and environmental impact.			
C. Technological Design			



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1. Plan, develop, and implement a proposal to solve an authentic, technological problem.			

STANDARD 5.5 (CHARACTERISTICS OF LIFE) 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. Relate the structure of molecules to their function in cellular structure and metabolism.			
2. Explain how plants convert light energy to chemical energy.		X	
3. Describe how plants produce substances high in energy content that become the primary source of energy for life.			
4. Relate disease in humans and other organisms to infections or intrinsic failures of system.			

B. Diversity and Biological Evolution

1. Explain that through evolution the Earth's present species developed from earlier distinctly different species.			
2. Explain how the theory of natural selection accounts for extinction as well as an increase in the proportion of individuals with advantageous characteristics within a species.			

C. Reproduction and Heredity

1. Describe how information is encoded and transmitted in genetic material.			
2. Explain how genetic material can be altered by natural and/or artificial means; mutations and new gene combinations may have positive, negative, or no effect on organisms or species.			



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3. Assess the impact of current and emerging technologies on our understanding of inherited human characteristics.			

STANDARD 5.6 (CHEMISTRY) ALL STUDENTS WILL GAIN AN UNDERSTANDING OF THE STRUCTURE AND BEHAVIOR OF MATTER.

A. Structure and Properties of Matter

1. Know that atoms are made of a positive nucleus surrounded by negative electrons and that the nucleus, a tiny fraction of the volume of an atom, is composed of protons and neutrons, each almost 2,000 times more massive than an electron.	XX	XX	XX
2. Know that the number of protons in the nucleus defines the element.	X	XX	XX
3. Know that an atom's electron arrangement, particularly the outermost electrons, determines how the atom can interact with other atoms.	XX	XX	XX
4. Explain that atoms form bonds (ionic and covalent) with other atoms by transferring or sharing electrons.	X	XX	XX
5. Explain how the Periodic Table of Elements reflects the relationship between the properties of elements and their atomic structure.	X	XX	XX
6. Know that many biological, chemical and physical phenomena can be explained by changes in the arrangement and motion of atoms and molecules.	XX	XX	XX
7. Recognize that the properties of matter are related to the structure and arrangement of their molecules and atoms, such as in metallic and nonmetallic crystals and carbon compounds.	XX	XX	XX



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8. Know that different levels of energy of an atom are associated with different configurations of its electrons.	X	XX	XX
B. Chemical Reactions			
1. Explain that the rate of reactions among atoms and molecules depends on how often they encounter one another and that the rate is affected by nature of reactants, concentration, pressure, temperature, and the presence of a catalyst.	X	XX	XX
2. Show that some changes in chemical bonds require a net input or net release of energy.	X	XX	XX