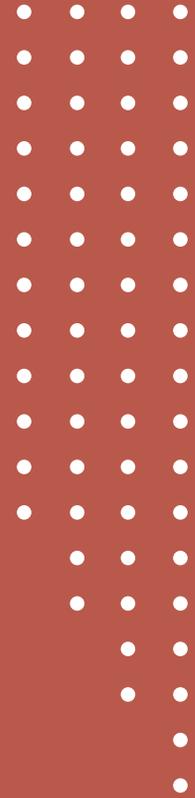


Chapter 2

THE STANDARDS USED IN THIS FRAMEWORK

Part A: New Jersey's Science Standards

Part B: New Jersey's Cross-Content
Workplace Readiness
Standards



PART A: NEW JERSEY'S SCIENCE STANDARDS

Each of New Jersey's twelve *Science Standards* is accompanied by a set of cumulative progress indicators. These standards and indicators, listed briefly in this chapter, are the topics of two later Framework chapters. Chapter 7 briefly discusses the five science process standards (5.1-5.5, referred to in this document as *Science Standards 1-5*). Chapter 8 focuses on the seven content standards (5.6-5.12, referred to in as *Science Standards 6-12*) and includes hundreds of sample learning activities.

LIST OF SCIENCE STANDARDS

The Process Standards

Standard 5.1 (*Science Standard 1*): All students will learn to identify systems of interacting components and understand how their interactions combine to produce the overall behavior of the system.

Standard 5.2 (*Science Standard 2*): 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.

Standard 5.3 (*Science Standard 3*): 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.

Standard 5.4 (*Science Standard 4*): All students will develop an understanding of technology as an application of scientific principles.

Standard 5.5 (*Science Standard 5*): All students will integrate mathematics as a tool for problem-solving in science, and as a means of expressing and/or modeling scientific theories.

The Content Standards

Standard 5.6 (*Science Standard 6*): All students will gain an understanding of the structure, characteristics, and basic needs of organisms.

Standard 5.7 (*Science Standard 7*): All students will investigate the diversity of life.

Standard 5.8 (*Science Standard 8*): All students will gain an understanding of the structure and behavior of matter.

Standard 5.9 (*Science Standard 9*): All students will gain an understanding of natural laws as they apply to motion, forces, and energy transformations.

Standard 5.10 (*Science Standard 10*): All students will gain an understanding of the structure, dynamics, and geophysical systems of the Earth.

Standard 5.11 (*Science Standard 11*): All students will gain an understanding of the origin, evolution, and structure of the universe.

Standard 5.12 (*Science Standard 12*): All students will develop an understanding of the environment as a system of interdependent components affected by human activity and natural phenomena.

THE SCIENCE STANDARDS AND THEIR CUMULATIVE PROGRESS INDICATORS

Science Standard 1

All students will learn to identify systems of interacting components and understand how their interactions combine to produce the overall behavior of the system.

Descriptive Statement: The natural world and the world built by humans both provide examples of systems where interacting parts work together as a whole. This standard asks students to analyze, understand, and design systems of integrating parts.

Cumulative Progress Indicators

By the end of Grade 4, students

1. Recognize that most things are made of components that, when assembled, can do things they could not do separately.
2. Recognize that since the components of a system usually influence one another, a system may not work if a component is missing.
3. Diagram the components of a system.

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 8, students

4. Describe components of a system and how they influence one another.
5. Recognize that most systems are components of larger systems and that the output of one component can become the input to other components.
6. Disassemble and reassemble the components of a system, analyzing how they interact with each other.

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 12, students

7. Recognize that the behavior of a system may be different from the behavior of its components.

8. Explain how feedback can be used to control the behavior of a system.
9. Identify and diagram feedback loops that occur in biological or ecological systems.
10. Identify and diagram feedback loops designed for common control systems, such as home light switches and thermostats.

Science Standard 2

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.

Descriptive Statement: Students best learn science by doing science. Science is not merely a collection of facts and theories but a process, a way of thinking about and investigating the world in which we live. This standard addresses those skills that are used by scientists as they discover and explain the physical universe—skills that are an essential and ongoing part of learning science.

Cumulative Progress Indicators

By the end of Grade 4, students

1. State a problem about the natural world in the form of a question.
2. Develop strategies and skills for information-gathering and problem-solving, using appropriate tools and technologies.
3. Use technology to present the design and results of investigation.
4. Keep a journal record of observations, recognizing patterns of observations and summarizing findings.
5. Learn what constitutes evidence and evaluate the data and information used to make explanations.

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 8, students

6. Identify problems that can be solved by conducting experiments.

7. Design and conduct experiments incorporating the use of a control.
8. Collect and organize data to support the results of an experiment.
9. Communicate experimental findings using words, charts, graphs, pictures, and diagrams.
10. Evaluate the strengths and weaknesses of claims, arguments, and data.
11. Assess the risks and benefits associated with alternative actions.

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 12, students

12. Select and use appropriate instrumentation to design and conduct investigations.
13. Use technology to present the design and results of investigation.
14. Evaluate conclusions, weigh evidence, and recognize that arguments may not have equal merit.
15. Explain how experimental results lead to further investigation.

Science Standard 3

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.

Descriptive Statement: Science is a human endeavor involving successes and failures, trials and tribulations. Students should know that many people of all cultures have contributed to our understanding of science and that science has a rich and fascinating history. This standard encourages students to learn about the people and events that have shaped or revolutionized important scientific theories and concepts.

Cumulative Progress Indicators

By the end of Grade 4, students

1. Hear, read, write, and talk about scientists and inventors in historical context.

2. Recognize that scientific ideas and knowledge have come from men and women of all cultures.

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 8, students

3. Recognize that scientific theories emerge over time, depend on the contributions of many people, and reflect the social and political climate of their time.
4. Develop a time line of major events and people in the history of science, in conjunction with other world events.
5. Trace the historical origin of important scientific developments such as atomic theory, genetics, plate tectonics, etc., showing how scientific theories emerge, are tested, and can be replaced or modified in light of new information and improved investigative techniques.

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 12, students

6. Recognize the role of the scientific community in responding to changing social and political conditions.
7. Examine the lives and contributions of important scientists and engineers who effected major breakthroughs in our understanding of the natural world.

Science Standard 4

All students will develop an understanding of technology as an application of scientific principles.

Descriptive Statement: Understanding the unique interdependence of science and technology is an important goal of science education. This standard is an attempt to show students how the application of scientific knowledge can be used to improve the human condition and how technological development affects the quality of life.

Cumulative Progress Indicators

By the end of Grade 4, students

1. Develop skill in the use of tools for everyday purposes.
2. Demonstrate how tools are used to do things better and more easily or to do tasks that could not otherwise be done.

3. Examine and compare toys and other familiar objects and explain how they work.
4. Find and report on examples of how technology helps people.

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 8, students

5. Describe how tools of today are different from those of the past but may be modifications of ancient tools.
6. Describe how technology expands the ability of scientists and others to make observations.
7. Design and build simple mechanical devices to demonstrate scientific principles.
8. Explain how engineers and others apply scientific knowledge to solve practical problems.
9. Compare the advantages and disadvantages of alternative solutions to practical problems.

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 12, students

10. Recognize that technological problems often create a demand for new scientific knowledge, and cite present and past examples of the interrelationship and mutual influence of science, technology and society.
11. Participate in a design project that identifies a problem, proposes and implements a solution, and evaluates the consequences of that solution.

Science Standard 5

All students will integrate mathematics as a tool for problem solving in science, and as a means of expressing and/or modeling scientific theories.

Descriptive Statement: Galileo is credited with asserting that “Mathematics is the language with which God wrote the Universe.” Science cannot be practiced or learned without appreciation of the role of mathematics in discovering and expressing natural laws. This standard recognizes the need for students to fully integrate mathematics skills with their learning of science.

Cumulative Progress Indicators

By the end of Grade 4, students

1. Judge whether estimates, measurements, and computations of quantities are reasonable.
2. Use a variety of measuring instruments, emphasizing appropriate units.
3. Use mathematical skills and concepts in ordering, counting, identifying, measuring, and describing.
4. Use tables and graphs to represent and interpret data.

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 8, students

5. Recognize and comprehend the orders of magnitude associated with large and small physical quantities.
6. Express experimental data in several equivalent forms such as integers, fractions, decimals, and percents.
7. Infer mathematical relationships among variables using graphs, tables, and charts.
8. Express the output units of the calculation in terms of the input units.
9. Select appropriate measuring instruments based on the degree of precision needed.
10. Find the mean and median of a set of experimental data.

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 12, students

11. Express the results of mathematical operations based on the degree of precision of the input data.
12. Use computer spreadsheets, graphing, and database programs to assist in quantitative analysis.
13. Evaluate the possible effects of measurement errors on calculations.
14. Express physical relationships in terms of mathematical equations derived from collected data.
15. Use mathematical models to predict physical phenomena.

Science Standard 6

All students will gain an understanding of the structure, characteristics, and basic needs of organisms.

Descriptive Statement: The study of science must include the diversity, complexity, and interdependence of life on Earth. Students should know how organisms evolve, reproduce, and adapt to their environments. *Science Standards 6 and 7* serve to define the fundamental understandings of the life sciences.

Cumulative Progress Indicators

By the end of Grade 4, students

1. Compare and contrast living and nonliving things.
2. Determine the basic needs of organisms.
3. Show that living things have different levels of organization.
4. Show that plants and animals are composed of different parts serving different purposes and working together for the well-being of the organism.
5. Describe life cycles of organisms.
6. Group organisms according to the functions they serve in a food chain.
7. Identify the major systems of the human body and explain how their functions are interrelated.

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 8, students

8. Describe and give examples of the major categories of living organisms and of the characteristics shared by organisms.
9. Recognize that complex multicellular organisms are interacting systems of cells, tissues, and organs.
10. Identify and describe the structure and function of cell parts.
11. Explain how organisms are affected by different components of an ecosystem and the flow of energy through it.

12. Illustrate and explain life cycles of organisms.

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 12, students

13. Identify and describe organisms that possess characteristics of living and nonliving things.
14. Identify and explain the structure and function of molecules that control cellular activities.
15. Explain how plants convert light energy to chemical energy.
16. Describe how plants produce substances high in energy content that become the primary source of energy for animal life.
17. Compare and contrast the life cycles of living things as they interact with ecosystems.

Science Standard 7

All students will investigate the diversity of life.

Descriptive Statement: The study of science must include the diversity, complexity, and interdependence of life on earth. Students should know how organisms evolve, reproduce, and adapt to their environments. *Science Standards 6* and *7* serve to define the fundamental understandings of the life sciences.

Cumulative Progress Indicators

By the end of Grade 4, students

1. Recognize the diversity of plants and animals on earth.
2. Develop a simple classification scheme for grouping organisms.
3. Recognize that individuals vary within every species.
4. Identify and describe external features of plants and animals that help them survive in varied habitats.

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 8, students

5. Illustrate how the sorting and recombining of genetic material results in the potential for variation among offspring.

6. Compare and contrast acquired and inherited characteristics.
7. Classify organisms by their internal and external characteristics.
8. Discuss how changing environmental conditions can result in evolution of a species.
9. Recognize that individual organisms with certain traits are more likely to survive and have offspring.
10. Describe how information is encoded in genetic material.

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 12, students

11. Explain how DNA can be altered by natural or artificial means to produce permanent changes in a species.
12. Explain that, through evolution, the earth's present species developed from earlier distinctly different species.
13. Explain how the theory of natural selection accounts for an increase in the proportion of individuals with advantageous characteristics within a species.

Science Standard 8

All students will gain an understanding of the structure and behavior of matter.

Descriptive Statement: Exploring the nature of matter and energy is essential to an understanding of the physical universe. This standard leads students from their experiences with the states and properties of matter to the development of atomic models and the underlying principles of chemistry.

Cumulative Progress Indicators

By the end of Grade 4, students

1. Describe and sort objects according to the materials from which they are made and their physical properties.
2. Recognize that matter can exist as a solid, liquid, or gas, and can be transformed from one state to another by heating or cooling.

3. Investigate matter by observing materials under magnification.

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 8, students

4. Identify characteristic properties of matter, and use one or more of those properties to separate a mixture of substances.
5. Show how substances can react with each other to form new substances having characteristic properties different from those of the original substances.
6. Know that all matter is made up of atoms that may join together to form molecules, and that the state of matter is determined by the arrangement and motion of the atoms or molecules.
7. Explain how atoms are rearranged when substances react, but that the total number of atoms and the total mass of the newly formed substances remains the same as that of the original substances.
8. Explain that over 100 different atoms, corresponding to over 100 different elements, have been identified and can be grouped according to their similar properties.

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 12, students

9. Know that atoms consist of a nucleus surrounded by electrons, and that the arrangement of the electrons determines the chemical behavior of each element.
10. Know that the nucleus consists of protons and neutrons, and that each atom of a given element has the same number of protons but that the number of neutrons may vary.
11. Explain how atoms can form bonds to other atoms by transferring or sharing electrons.
12. Demonstrate different types of chemical reactions and the various factors affecting reaction rates.
13. Explain how the Periodic Table of Elements evolved and how it relates atomic structure to the physical and chemical properties of the elements.

Science Standard 9

All students will gain an understanding of natural laws as they apply to motion, forces, and energy transformations.

Descriptive Statement: Basic principles of physics emerge in this standard, where the study of force and motion leads to the concept of energy. All forms of energy are introduced and investigated, and principles of transformation and laws of conservation are developed.

Cumulative Progress Indicators

By the end of Grade 4, students

1. Demonstrate that the motion of an object can vary in speed and direction.
2. Demonstrate that the position and motion of an object can be changed by pushing or pulling and that the change is related to the strength of the push or pull.
3. Recognize that some forces are invisible and can act at a distance.
4. Investigate sources of heat and show how heat can be transferred from one place to another.
5. Investigate sources of light and show how light behaves when it strikes different objects.
6. Demonstrate how sound can be produced by vibrating objects and how the pitch of the sound depends on the rate of vibration.
7. Demonstrate how electricity can be used to produce heat, light, and sound.

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 8, students

8. Explain how a moving object that is not being subjected to a net force will move in a straight line at a steady speed.
9. Show that when more than one force acts on an object at the same time, the forces can reinforce or cancel each other, producing a net force that will change the speed or direction of the object.
10. Investigate how the force of friction acts to retard motion.

11. Describe the various forms of energy, including heat, light, sound, chemical, nuclear, mechanical, and electrical energy, and that energy can be transformed from one form to another.
12. Explain how heat flows through materials or across space from warmer objects to cooler ones until both objects are at the same temperature.
13. Explain that the sun is a major source of the earth's energy, and that energy is emitted in various forms, including visible light, infrared and ultraviolet radiation.
14. Show how light is reflected, refracted, or absorbed when it interacts with matter, and how colors appear as a result of this interaction.
15. Show how vibrations in materials can generate waves, which can transfer energy from one place to another.

***Building upon knowledge and skills gained in the preceding grades,
by the end of Grade 12, students***

16. Explain the mathematical relationship between the mass of an object, the unbalanced force exerted on it, and the resulting acceleration.
17. Prove that whenever one object exerts a force on another, an equal amount of force is exerted back on the first object.
18. Know that gravity is a universal force of attraction between masses that depends on the masses and the distance between them.
19. Know that electrically charged bodies can attract or repel each other with a force that depends on the size and nature of the charges and the distance between them.
20. Explain the similarities and differences between gravitational forces and electrical forces that act at a distance.
21. Know that the forces that hold the nucleus of an atom together are stronger than electromagnetic forces and that significant amounts of energy are released during nuclear changes.
22. Explain how electromagnetic waves are generated, and identify the components of the electromagnetic spectrum.
23. Explain that all energy is either kinetic or potential and that the total energy of the universe is constant.

Science Standard 10

All students will gain an understanding of the structure, dynamics, and geophysical systems of the earth.

Descriptive Statement: The study of science should include a study of the planet Earth and its relationship to the rest of the universe. This standard describes what students should know about the composition of the Earth and the forces that shape it, while Science Standard 11 describes what students should know about astronomy and space science.

Cumulative Progress Indicators***By the end of Grade 4, students***

1. Recognize and demonstrate the use of different kinds of maps.
2. Investigate materials that make up the earth, including rocks, minerals, soils, and fossils, and how they are formed.
3. Identify major sources and uses of water, discussing the forms in which it appears.
4. Collect and record weather data to identify existing weather conditions, and recognize how those conditions affect our daily lives.

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 8, students

5. Compare different map projections, and explain how physical features are represented on each.
6. Identify the major features of the earth's crust, the processes and events that change them, and the impact of those changes on people.
7. Identify the age of fossils, and explain how they provide evidence that life has changed through time.
8. Describe and explain the causes of the natural processes and events that shaped the earth's surface and interior.
9. Monitor local weather conditions and changes in the atmosphere that lead to weather systems.
10. Investigate the composition, cycling, and distribution of the world's oceans and other naturally occurring sources of water.

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 12, students

11. Use the evidence provided by topography, fossils, rock stratification, ice cores, and radiometric data to investigate the earth's changes.
12. Use the theory of plate tectonics to explain the relationship among earthquakes, volcanoes, mid-ocean ridges, and deep sea trenches.
13. Explore how weather phenomena and human activity are interrelated.
14. Identify and explain factors that influence water quality needed to sustain life.

Science Standard 11

All students will gain an understanding of the origin, evolution, and structure of the universe.

Descriptive Statement: The study of science should include a study of the planet Earth and its relationship to the rest of the universe. This standard describes what students should know about the composition of the Earth and the forces that shape it, while Science Standard 11 describes what students should know about astronomy and space science.

Cumulative Progress Indicators

By the end of Grade 4, students

1. Observe and identify objects and their apparent motion in the day and night sky.
2. Relate the motions of the earth-sun-moon system to units of time (days, months, seasons, years).
3. Construct a model of the solar system.

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 8, students

4. Describe the physical characteristics of the components of the solar system, and compare the earth to other planets.
5. Explain how naturally occurring events on earth are related to the positions of the sun, earth, and moon.

6. Describe the technologies used to explore the universe.

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 12, students

7. Construct a model that accounts for variation in the length of day and night.
8. Evaluate evidence that supports scientific theories of the origin of the universe.
9. Analyze benefits generated by the technology of space exploration.

Science Standard 12

All students will develop an understanding of the environment as a system of interdependent components affected by human activity and natural phenomena.

Descriptive Statement: Creating an awareness of the need to protect and preserve natural resources is a goal of science education. This standard calls for students to develop knowledge of environmental issues, including management of natural resources, production and use of energy, waste management, and the interdependence of ecosystems.

Cumulative Progress Indicators

By the end of Grade 4, students

1. Investigate the interdependence of living things and their environment.
2. Explain how meeting human requirements affects the environment.
3. Recognize that natural resources are not always renewable.

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 8, students

4. Evaluate the impact of personal and societal activities on the local and global environment.
5. Compare and contrast practices that affect the use and management of natural resources.
6. Recognize that individuals and groups may have differing points of view on environmental issues.

7. Analyze the components of various ecosystems and the effects of those components on organisms.

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 12, students

8. Investigate the impact of natural phenomena and physical processes, such as earthquakes, volcanoes, forest fires, floods, and hurricanes, on the environment of different regions of the United States and the world.
9. Use scientific, economic, and other data to assess environmental risks and benefits associated with human activity.
10. Apply the concept of ecosystems to understand and solve problems regarding environmental issues.

PART B: NEW JERSEY'S CROSS-CONTENT WORKPLACE READINESS STANDARDS

As the content committees met and reviewed the eight subject-specific standards (the seven listed areas plus career education), certain themes reoccurred. These common themes reinforce the notion that each content area draws on key elements of other content areas. For example, the need for students to learn problem solving and critical thinking skills was reflected in all of the sets of standards. Since these cross-content workplace readiness standards are important to the success of all students in all content areas, they have been identified here for special emphasis.

LIST OF CROSS-CONTENT WORKPLACE READINESS STANDARDS

Cross-Content Workplace Readiness Standard 1:

All students will develop career planning and workplace readiness skills.

Cross-Content Workplace Readiness Standard 2:

All students will use information, technology, and other tools.

Cross-Content Workplace Readiness Standard 3:

All students will use critical thinking, decision making, and problem solving skills.

Cross-Content Workplace Readiness Standard 4:

All students will demonstrate self-management skills.

Cross-Content Workplace Readiness Standard 5:

All students will apply safety principles.

While the indicators for the cross-content workplace readiness standards are not broken out by grade level, districts should begin building these concepts into their programs at the K-4 level in age-appropriate activities, e.g., focusing on positive work habits. Others of the concepts are more appropriate for the higher grade levels, e.g., preparing a resume and completing job applications.

The following is a list of the *Cross-Content Workplace Readiness Standards*, with cumulative progress indicators of student skills in each area. Unlike the progress indicators for the seven specific content sections, these indicators are not broken down into grade-level clusters because, in addition to crossing all content areas, they also cross all grade levels. Teachers should integrate these concepts into all programs in content-specific and grade-appropriate ways.

Cross-Content Workplace Readiness Standard 1

All students will develop career planning and workplace readiness skills.

Descriptive Statement: Students will be expected to develop the skills to seek, obtain, maintain, and change jobs. These skills are critical to each student's future ability to navigate in the complex world of work. Prior to leaving school, each student should possess the skills needed to sustain him/herself as an adult in the labor force.

Cumulative Progress Indicators

All students will be able to

1. Demonstrate employability skills and work habits, such as work ethic, dependability, promptness, and getting along with others, needed to get and keep a job.
2. Describe the importance of personal skills and attitudes to job success.
3. Identify career interests, abilities, and skills.
4. Develop an individual career plan.
5. Identify skills that are transferable from one occupation to another.
6. Select a career major and appropriate accompanying courses.
7. Describe the importance of academic and occupational skills to achievement in the work world.
8. Demonstrate occupational skills developed through structured learning experiences, such as volunteer, community service, and work-based experiences or part-time employment.
9. Identify job openings.
10. Prepare a resume and complete job applications.
11. Demonstrate skills and attitudes necessary for a successful job interview.
12. Demonstrate consumer and other financial skills.

Cross-Content Workplace Readiness Standard 2

All students will use information, technology, and other tools.

Descriptive Statement: Students will be expected to develop skills in the use of information, up-to-date educational technology, and other tools to improve learning, achieve goals, and produce products and presentations. They will learn to develop, locate, summarize, organize, synthesize, and evaluate information. Students will be expected to use technological tools, such as telecommunications networking, for problem solving, writing, and research.

Cumulative Progress Indicators

All students will be able to

1. Understand how technological systems function.
2. Select appropriate tools and technology for specific activities.
3. Demonstrate skills needed to effectively access and use technology-based materials through keyboarding, troubleshooting, and retrieving and managing information.
4. Develop, search, and manipulate databases.
5. Access technology-based communication and information systems.
6. Access and assess information on specific topics using both technological (e.g., computer, telephone, satellite) and print resources available in libraries or media centers.
7. Use technology and other tools to solve problems, collect data, and make decisions.
8. Use technology and other tools, including word-processing, spreadsheet and presentation programs, and print or graphic utilities, to produce products.
9. Use technology to present designs and results of investigations.
10. Discuss problems related to the increasing use of technologies.

Cross-Content Workplace Readiness Standard 3

All students will use critical thinking, decision making, and problem-solving skills.

Descriptive Statement: Students will be expected to develop original thoughts and ideas, think creatively, develop habits of inquiry, and take intellectual and performance risks. They will be expected to recognize problems, devise a variety of ways to solve these problems, analyze the potential advantages and disadvantages of each alternative, and evaluate the effectiveness of the method ultimately selected.

Cumulative Progress Indicators

All students will be able to

1. Recognize and define a problem, or clarify decisions to be made.
2. Use models, relationships, and observations to clarify problems and potential solutions.
3. Formulate questions and hypotheses.
4. Identify and access resources, sources of information, and services in the school and the community.
5. Use the library media center as a critical resource for inquiry and assessment of print and nonprint materials.
6. Plan experiments.
7. Conduct systematic observations.
8. Organize, synthesize, and evaluate information for appropriateness and completeness.
9. Identify patterns and investigate relationships.
10. Monitor and validate their own thinking.
11. Identify and evaluate the validity of alternative solutions.
12. Interpret and analyze data to draw conclusions.
13. Select and apply appropriate solutions to problem solving and decision making situations.
14. Evaluate the effectiveness of various solutions.
15. Apply problem solving skills to original and creative/design projects.

Cross-Content Workplace Readiness Standard 4

All students will demonstrate self-management skills.

Descriptive Statement: Students will be expected to address issues related to personal development, such as accepting responsibility for their own learning and understanding expectations for performance. They are also expected to demonstrate positive work behaviors and ethics, the ability to work individually and cooperatively in groups, and respect for others of diverse cultural and social backgrounds.

Cumulative Progress Indicators

All students will be able to

1. Set short- and long-term goals.
2. Work cooperatively with others to accomplish a task.
3. Evaluate their own actions and accomplishments.
4. Describe constructive responses to criticism.
5. Provide constructive criticism to others.
6. Describe actions which demonstrate respect for people of different races, ages, religions, ethnicity and gender.
7. Describe the roles people play in groups.
8. Demonstrate refusal skills.
9. Use time efficiently and effectively.
10. Apply study skills to expand their own knowledge and skills.
11. Describe how ability, effort, and achievement are interrelated.

Cross-Content Workplace Readiness Standard 5

All students will apply safety principles.

Descriptive Statement: Safety is an important component of all content areas, especially the arts, health and physical education, science, occupational education programs, and any content area where hands-on activities take place. Students need to learn behaviors that will ensure their own safety and health and that of others. They also should become familiar with the rules and laws governing safety and health so that they can act responsibly to implement these standards.

Cumulative Progress Indicators

All students will be able to

1. Explain how common injuries can be prevented.
2. Develop and evaluate an injury prevention program.
3. Demonstrate principles of safe physical movement.
4. Demonstrate safe use of tools and equipment.
5. Identify and demonstrate the use of recommended safety and protective devices.
6. Identify common hazards and describe methods to correct them.
7. Identify and follow safety procedures for laboratory and other hands-on experiences.
8. Discuss rules and laws designed to promote safety and health, and their rationale.
9. Describe and demonstrate procedures for basic first aid and safety precautions.