

# District Curriculum Objectives

## Science - 6th Grade

### I. Scientific Method Application & Techniques

The Learner Will...

1. follow lab safety procedures
2. identify questions that can be answered through investigation
3. design and conduct a scientific investigation
4. use appropriate tools and techniques to gather, analyze and interpret data
5. use evidence to describe, predict, explain, and model
6. use critical thinking to find relationships between results and interpretations
7. consider alternative explanations and relationships
8. communicate procedures, results, and conclusions
9. use mathematics in scientific inquiry

### II. Biological, Physical & Earth Sciences

The Learner Will...

1. classify monerans, protists, fungi and plants
2. demonstrate knowledge of basic anatomy and physiology of plants
3. classify animals by identifying common traits
4. compare characteristics of vertebrates and invertebrates
5. describe the major global climate regions
6. identify the composition of the atmosphere, and how it supports and protects life
7. utilize weather instruments to investigate weather patterns

### III. Social, Environmental & Technological Development

The Learner Will...

1. explain the interrelationship between living and non-living things in an ecosystem
2. contrast renewable and nonrenewable resources and the effects of recycling
3. demonstrate an understanding of human impact on ecosystems
4. discuss the impact of pollution on the planet earth
5. investigate and discuss current topics in life, earth and physical sciences
6. design and construct a project that tests scientific principles/laws
7. utilize current technology to further their understanding science topics and issues

## Science - 7th Grade

### I. Scientific Method Application & Techniques

The Learner Will...

1. follow lab safety procedures
2. identify questions that can be answered through investigation
3. design and conduct a scientific investigation
4. use appropriate tools and techniques to gather, analyze and interpret data
5. use evidence to describe, predict, explain, and model
6. use critical thinking to find relationships between results and interpretations
7. consider alternative explanations and relationships
8. communicate procedures, results, and conclusions
9. use mathematics in scientific inquiry

### II. Biological, Physical & Earth Sciences

The Learner Will...

1. apply Newton's Laws to explain force and motion
2. describe the relationship between force, work, and distance
3. explore how simple machines change the size or direction of a force
4. describe the organization and physical characteristics of the solar system (sun, planets, satellites, asteroids, and comets)
5. identify daily, seasonal, and annual patterns related to the Earth's rotation and revolution
6. identify the dynamic forces that cause the Earth to change
7. distinguish between igneous, sedimentary, and metamorphic rocks, and how one type of rock changes into another
8. describe and explain how weathering and erosion affect the surface of the Earth

### III. Social, Environmental & Technological Development

The Learner Will...

1. investigate the use of technology to explore and study space
2. understand how modern technology has changed the way we map the Earth
3. design and construct a project that tests for scientific principles/laws
4. investigate and discuss current topics in life, earth and physical sciences
5. utilize current technology to further their understanding science topics and issues

# Science - 8th Grade

## SCIENCE

### I. Scientific Method Applications & Techniques

The Learner Will. . .

1. follow lab safety procedures
2. identify questions that can be answered through investigation
3. design and conduct a scientific investigation
4. use appropriate tools and techniques to gather, analyze and interpret data
5. use evidence to describe, predict, explain, and model
6. use critical thinking to find relationships between results and interpretations
7. consider alternative explanations and relationships
8. communicate procedures, results, and conclusions
9. use mathematics in scientific inquiry

### II. Biological, Physical & Earth Sciences

The Learner Will...

1. explain how the movement of Earth's tectonic plates cause geologic changes (ie. earthquakes, volcanoes)
2. investigate Earth's fossil record and how it is used to explain geologic time
3. model and describe the chemical and physical characteristics of matter (atoms, molecules, elements, compounds, and mixtures)
4. identify and explain the importance of chemical reactions in everyday life
5. explain how cells function as building blocks of organisms
6. understand that cells require energy to grow, reproduce, and carry out life processes
7. demonstrate an understanding of the inheritance of genetic traits

### III. Social, Environmental & Technological Development

The Learner Will...

1. compare and contrast renewable and nonrenewable natural resources
2. evaluate the benefits and costs of various types of energy sources
3. understand how modern chemistry impacts society
4. explain the importance and applications of genetics in society
5. design and construct a project that tests scientific principles/laws
6. investigate and discuss current topics in life, earth and physical sciences
7. utilize current technology to further their understanding science topics and issues

**STATE GOAL 11: Understand the processes of scientific inquiry and technological design to investigate questions, conduct experiments and solve problems.**

**A. Know and apply the concepts, principles and processes of scientific inquiry.**

MIDDLE/JUNIOR HIGH SCHOOL	Grade 6	Grade 7	Grade 8
11.A.3a Formulate hypotheses that can be tested by collecting data.	X	X	X
11.A.3b Conduct scientific experiments that control all but one variable.	X	X	X
11.A.3c Collect and record data accurately using consistent measuring and recording techniques and media.	X	X	X
11.A.3d Explain the existence of unexpected results in a data set.	X	X	X
11.A.3e Use data manipulation tools and quantitative (e.g., mean, mode, simple equations) and representational methods (e.g., simulations, image processing) to analyze measurements.	X	X	X
11.A.3f Interpret and represent results of analysis to produce findings.	X	X	X
11.A.3g Report and display the process and results of a scientific investigation.	X	X	X

**B. Know and apply the concepts, principles and processes of technological design.**

MIDDLE/JUNIOR HIGH SCHOOL	Grade 6	Grade 7	Grade 8
11.B.3a Identify an actual design problem and establish criteria for determining the success of a solution.	X	X	X
11.B.3b Sketch, propose and compare design solutions to the problem considering available materials, tools, cost effectiveness and safety.	X	X	X
11.B.3c Select the most appropriate design and build a prototype or simulation.	X	X	X
11.B.3d Test the prototype using available materials, instruments and technology and record the data.	X	X	X
11.B.3e Evaluate the test results based on established criteria, note sources of error and recommend improvements.	X	X	X
11.B.3f Using available technology, report the relative success of the design based on the test results and criteria.	X	X	X

**STATE GOAL 12: Understand the fundamental concepts, principles and interconnections of the life, physical and earth/space sciences.**

**A. Know and apply concepts that explain how living things function, adapt and change.**

MIDDLE/JUNIOR HIGH SCHOOL	Grade 6	Grade 7	Grade 8
12.A.3a Explain how cells function as “building blocks” of organisms and describe the requirements for cells to live.	X		X
12.A.3b Compare characteristics of organisms produced from a single parent with those of organisms produced by two parents.	X		X
12.A.3c Compare and contrast how different forms and structures reflect different functions (e.g., similarities and differences among animals that fly, walk or swim; structures of plant cells and animal cells).	X		

**B. Know and apply concepts that describe how living things interact with each other and with their environment.**

MIDDLE/JUNIOR HIGH SCHOOL	Grade 6	Grade 7	Grade 8
12.B.3a Identify and classify biotic and abiotic factors in an environment that affect population density, habitat and placement of organisms in an energy pyramid.	X		
12.B.3b Compare and assess features of organisms for their adaptive, competitive and survival potential (e.g., appendages, reproductive rates, camouflage, defensive structures).	X		

**C. Know and apply concepts that describe properties of matter and energy and the interactions between them.**

MIDDLE/JUNIOR HIGH SCHOOL	Grade 6	Grade 7	Grade 8
12.C.3a Explain interactions of energy with matter including changes of state and conservation of mass and energy.			X
12.C.3b Model and describe the chemical and physical characteristics of matter (e.g., atoms, molecules, elements, compounds, mixtures).			X

**D. Know and apply concepts that describe force and motion and the principles that explain them.**

MIDDLE/JUNIOR HIGH SCHOOL	Grade 6	Grade 7	Grade 8
12.D.3a Explain and demonstrate how forces affect motion (e.g., action/reaction, equilibrium conditions, free-falling objects).		X	
12.D.3b Explain the factors that affect the gravitational forces on objects (e.g., changes in mass, distance).		X	

**E. Know and apply concepts that describe the features and processes of the Earth and its resources.**

MIDDLE/JUNIOR HIGH SCHOOL	Grade 6	Grade 7	Grade 8
12.E.3a Analyze and explain large-scale dynamic forces, events and processes that affect the Earth's land, water and atmospheric systems (e.g., jetstream, hurricanes, plate tectonics).	X	X	X
12.E.3b Describe interactions between solid earth, oceans, atmosphere and organisms that have resulted in ongoing changes of Earth (e.g., erosion, El Nino).	X	X	X
12.E.2c Identify and classify recyclable materials.	X	X	X

**F. Know and apply concepts that explain the composition and structure of the universe and Earth's place in it.**

MIDDLE/JUNIOR HIGH SCHOOL	Grade 6	Grade 7	Grade 8
12.F.3a Simulate, analyze and explain the effects of gravitational force in the solar system (e.g., orbital shape and speed, tides, spherical shape of the planets and moons).		X	
12.F.3b Describe the organization and physical characteristics of the solar system (e.g., sun, planets, satellites, asteroids, comets).		X	
12.F.3c Compare and contrast the sun as a star with other objects in the Milky Way Galaxy (e.g., nebulae, dust clouds, stars, black holes).		X	

**STATE GOAL 13: Understand the relationships among science, technology and society in historical and contemporary contexts.**

**A. Know and apply the accepted practices of science.**

MIDDLE/JUNIOR HIGH SCHOOL	Grade 6	Grade 7	Grade 8
13.A.3a Identify and reduce potential hazards in science activities (e.g., ventilation, handling chemicals).	X	X	X
13.A.3b Analyze historical and contemporary cases in which the work of science has been affected by both valid and biased scientific practices.	X	X	X
13.A.3c Explain what is similar and different about observational and experimental investigations.	X	X	X

**B. Know and apply concepts that describe the interaction between science, technology and society.**

MIDDLE/JUNIOR HIGH SCHOOL	Grade 6	Grade 7	Grade 8
13.B.3a Identify and explain ways that scientific knowledge and economics drive technological development.	X	X	X
13.B.3b Identify important contributions to science and technology that have been made by individuals and groups from various cultures.	X	X	X
13.B.3c Describe how occupations use scientific and technological knowledge and skills.	X	X	X
13.B.3d Analyze the interaction of resource acquisition, technological development and ecosystem impact (e.g., diamond, coal or gold mining; deforestation).	X	X	X
13.B.3e Identify advantages and disadvantages of natural resource conservation and management programs.	X	X	X
13.B.3f Apply classroom-developed criteria to determine the effects of policies on local science and technology issues (e.g., energy consumption, landfills, water quality).	X	X	X