Prioritized Curriculum

PHYSICAL SCIENCE – GRADE 9

Updated: July 2011

CSO's	Essential	Important	Need to Know
SC.O.PS.			
1.1	X		
1.2	X		
1.3		X	
1.4	X		
1.5	X		
1.6		X	
1.7	X		
SC.O.PS.2.1			
2.1	X		
2.2	X		
2.3	X		
2.4	X		
2.5	X		
2.6	X		
2.7	X		
2.8	X		
2.9		X	
2.10	X		
2.11		X	
2.12		X	
2.13	X		
2.14		X	
2.15		X	
2.16	X		
2.17	X		
2.18	X		
2.19	X		
2.20	X		
2.21	X		
2.22	X		
2.23	X		

PHYSICAL SCIENCE CONCEPT MAP

Key Concepts:

- Composition of the earth
- Weather forecasting
- Climatic conditions
- Plate tectonics
- Change over time

Estimated days to complete – 10

Topic: Ch. 12, 17, 20, & 21
Earth Systems
SC.O.PS 2.21, 2.22, 2.23, 2.24

Enduring Understanding:
What are the major systems of the earth?

Essential Question(s) What are the layers of the earth? What factors are necessary to predict the weather? How is the climate influenced by the earth's surface? What evidence supports the theory of plate tectonics? How does the earth's surface change over time?

Examples:

- Diagram layers of the earth
- Models of volcanoes
- Weather maps

Key Vocabulary:

- Lithosphere
- Front
- Air mass
- Climate
- Weather
- Earthquake
- Volcanoes
- Weathering

PHYSICAL SCIENCE CONCEPT MAP

Key Concepts:

Conservation of mass and energy

Predict, determine and diagram magnetic fields

Construct and explain DC circuits using Ohm's law

Estimated days to complete – 10

Topic: Ch. 13, 14, & 15
Magnetism and Electricity
SC.O.PS 2.13, 2.14

Enduring Understanding:
How are magnetism and electricity related?

Essential Question(s): What is the difference between AC & DC? How does electricity affect magnetism? How are electromagnetic waves affecting communication?

Examples:

Diagram magnetic fields

Diagram series and parallel circuits

Build an electromagnet

Key Vocabulary:

Induction
circuit

Conductor
Electric current

Insulator
Parallel & series circuits

Ohm's law
Alternating current

Direct current
Electro-magnet

Magnetic field
Generator

Electromagnetic wave
Radiant energy

PHYSICAL SCIENCE CONCEPT MAP

Key Concepts:

Use vectors to illustrate Newton's law of motion

Mechanical advantage of simple machines

Calculate velocity and average speed

Estimated days to complete – 15

Topic: Ch. 3, 4, 5 & 6
Motion and Forces
SC.O.PS: 2.16, 2.17

Enduring Understanding:
How are motion and forces related?

Essential Question(s): What is the difference between speed and velocity? What are the main concepts of Newton's laws of motion? How do simple machines make doing work easier?

Examples:

Calculate speed, acceleration, momentum, work, etc

Graph motion using vectors

Illustrate how simple machines make up compound

Key Vocabulary:

Acceleration
Displacement

Force
Friction

Speed
Vector

Centripetal force
Gravity

Inertia
Momentum

Weight
Simple machine

Compound machine
Work

Power
Mechanical advantage

PHYSICAL SCIENCE CONCEPT MAP

Key Concepts:

Radioactivity and nuclear structure

Discovery of radioactivity

Alpha, beta particles
Gamma rays

Nuclear Fission
Nuclear Fusion

Nuclear medicine

Estimated days to complete – 5

Topic: Ch. 25
Nuclear Changes
SC.O.PS: 2.10

Enduring Understanding:
What is radioactivity?

Essential Question(s): What are the properties of radioactive and stable nuclei? How is radioactivity used in medicine? What is fission? What is fusion? How can I model radioactive decay?

Examples:

Graph of radioactive decay

Research about nuclear medicine techniques and careers

Key Vocabulary:

Alpha particle

Beta particle

Gamma ray

Half-life

Nuclear fission

Nuclear fusion

Radioactivity

PHYSICAL SCIENCE CONCEPT MAP

Key Concepts:

Scientific and technological solutions

Using advanced technology tools

Estimated days to complete – 5

Topic: Ch. 2
Technology
SC.O.PS: 1.6, 1.7

Enduring Understanding:
How does science influence the advancement of technology?

Essential Question(s)

Examples:

Use computers

Models of volcanoes

Use various

Key Vocabulary:

Technology

Object

Technique

Skill

System

PHYSICAL SCIENCE CONCEPT MAP

Key Concepts:

Writing and naming chemical formulas

Writing and balancing chemical equations

Classifying chemical equations

Chemical bonds

Polar and non-polar compounds and characteristics

Estimated days to complete – 10

Topic: Ch. 22, 23, & 24
Chemical Reactions
SC.O. PS: 2.5, 2.6, 2.7, 2.8, 2.9

Enduring Understanding:
What is a chemical reaction?

Essential Question(s): what is a chemical formula? How do I write a chemical formula and name it? What are chemical bonds? What are the different types of chemical reactions? How do I write out a chemical reaction and balance it?

Examples:

Learning to balance chemical equations

Naming chemical compounds

Classifying chemical reactions

Bonding activity

Key Vocabulary:

Chemical formula

Chemical reaction

Covalent bond

Ionic bond

Oxidation

Reduction

Polar

Non-polar

Endothermic

Exothermic

Chemical equation Product

Reactant Polyatomic ion

PHYSICAL SCIENCE CONCEPT MAP

Key Concepts:

Relationship between distance and intensity of light and sound

Transverse and longitudinal waves of light and sound

Estimated days to complete – 5

Topic: Ch. 10 & 11
Light and Sound
SC.O.PS: 2.15, 2.19

Enduring Understanding:
How are light and sound related?

Essential Question(s): How does distance affect light and sound?
How are transverse and longitudinal waves different?

Examples:

Illustrate type of waves

Illustrate diffraction and interference

Observing wave length

Measure amplitude
Illustrate focal length

Key Vocabulary:

Amplitude

Diffraction frequency

Resonance trough

Waves
Wavelength

Concave lens
Concave mirror

Convex lens
Convex mirror

Intensity

Translucent

Transparent

PHYSICAL SCIENCE CONCEPT MAP

Key Concepts:

Relations within the earth-moon system

The Solar System

Stars and galaxies

Estimated days to complete – 10

Topic: Ch. 7, 8, 26
Origin & Changes in Earth system and Universe
SC.O.PS: 2.25

Enduring Understanding: What role does the earth play in the overall universe?

Essential Question(s): What influence does the moon have on the earth? Why has Pluto been demoted? How are stars and galaxies held together?

Examples:

- Theories of origin of solar system and universe
- Make model of solar system
- Illustrating the moon phases
- Students create star charts to learn major constellations and stars

Key Vocabulary:

- Universe
- Planet
- Star
- Galaxy
- Satellite

PHYSICAL SCIENCE CONCEPT MAP

Key Concepts:

Method of Science

Standards of Measurements

Communicating with graphs

Estimated days to complete – 5

Topic: Ch. 1
Safety, Measurement, & Scientific Method
SC.O.PS: 2.1, 1.1, 1.3, 1.4, 1.5, 1.6

Enduring Understanding: What is the value of science?

Essential Question(s): What is the scientific method?
What are standards of measurement?
What are the three types of graphs?

Examples:

Reviewing safety equipment

Making and interpreting graphs and charts

Metric System conversions

Key Vocabulary:

bias

constant control

density
dependent variable

experiment
graph

hypothesis
independent variable

Mass
model

Scientific lab

Scientific method
technology

theory variable

volume

PHYSICAL SCIENCE CONCEPT MAP

Key Concepts:

Elements and compounds

Solutions

Phys/Chem. Properties
Phys/Chem changes
Law of Conservation of Mass

Periodic Table

Atomic structure
Electron arrangement

Estimated days to complete – 10

Topic: Ch. 18 & 19
Structure and Properties of Matter
SC.O.PS: 2.2

Enduring Understanding:
What is matter composed of and how is it classified?

Essential Question(s): How do you predict the chemical and physical properties of an element using the periodic table? What are solutions, colloids, and suspensions? How are physical & chemical changes different? What is the law of conservation of mass? What are the components of an atom and how are they arranged?

Examples:

Activity: Build an atom

Lab-physical and chemical changes

Periodic Table
Project
Adopt an element

Electron dot activity

Key Vocabulary:

Chemical change

Physical change

Element

Matter

Atom

Compound

Atomic number

Electron

Isotope

Neutron

Nucleus

Proton Periodic table