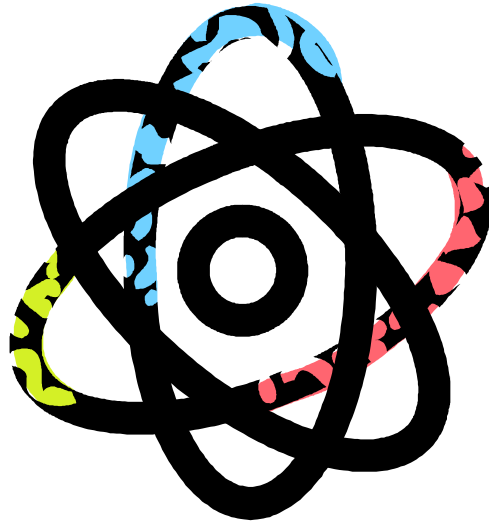


Integrated Physical Science

9th Grade Science Curriculum



Bridgeport Public Schools

Aresta L. Thompson
Director Science/ Life Skills



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Aresta L. Thompson, Director of Science

9th Grade Science Curriculum Committee

Candice Dritschler - Teacher Central High School

John Hatfield - Teacher Central High School

Donna Koolis - Depart. Chair, Bassick High School

Christine Rauscher - Teacher Central High School

DRAFT 2007

INTEGRATED PHYSICAL SCIENCE

COURSE OUTLINE

I. INTRODUCTION TO PHYSICAL SCIENCE

- A. The Scientific Method
- B. Scientific Measurement

II. PROPERTIES OF MATTER

- A. Chemical and Physical Properties
- B. Classification of Matter

III. ATOMIC STRUCTURE

- A. Historical Development to Modern Atomic Theory
- B. Subatomic Particles

IV. PERIODIC TABLE

- A. The Modern Periodic Table
- B. Classification of The Elements
- C. Atomic Number and Atomic Mass
- D. Properties of The First Twenty Elements

V. CHEMICAL BONDS

- A. Ionic Bonding
- B. Covalent Bonding

VI. ACIDS AND BASES

- A. Properties of Acids and Bases
- B. Strengths of Acids and Bases

EMBEDDED TASK: "Acid Rain" Laboratory Investigation

VII. CARBON CHEMISTRY

- A. Formation Of Carbon Compounds
- B. Types of Carbon Compounds
- C. Fossil Fuels
- D. Polymers
- E. Molecules Of Living Systems

EMBEDDED TASK: "Synthetic Polymers" Laboratory Investigation

EMBEDDED TASK: "Synthetic Polymers" Science, Technology & Society

VIII. ENERGY FORMS AND CHANGES

- A. Thermal Energy And Heat
- B. Phase Changes
- C. Energy Transfer
- D. Energy Types and Transformations

IX. ELECTRICITY

- A. Electric Charge And Static Electricity
- B. Electric Current
- C. Electric Circuits
- D. Ohm's law

X. MAGNETISM AND POWER GENERATION

- A. Magnets And Magnetic Fields
- B. Electromagnetism
- C. Generation and Transmission of Electrical Energy

EMBEDDED TASK: "Energy Uses In Connecticut" Science, Technology & Society

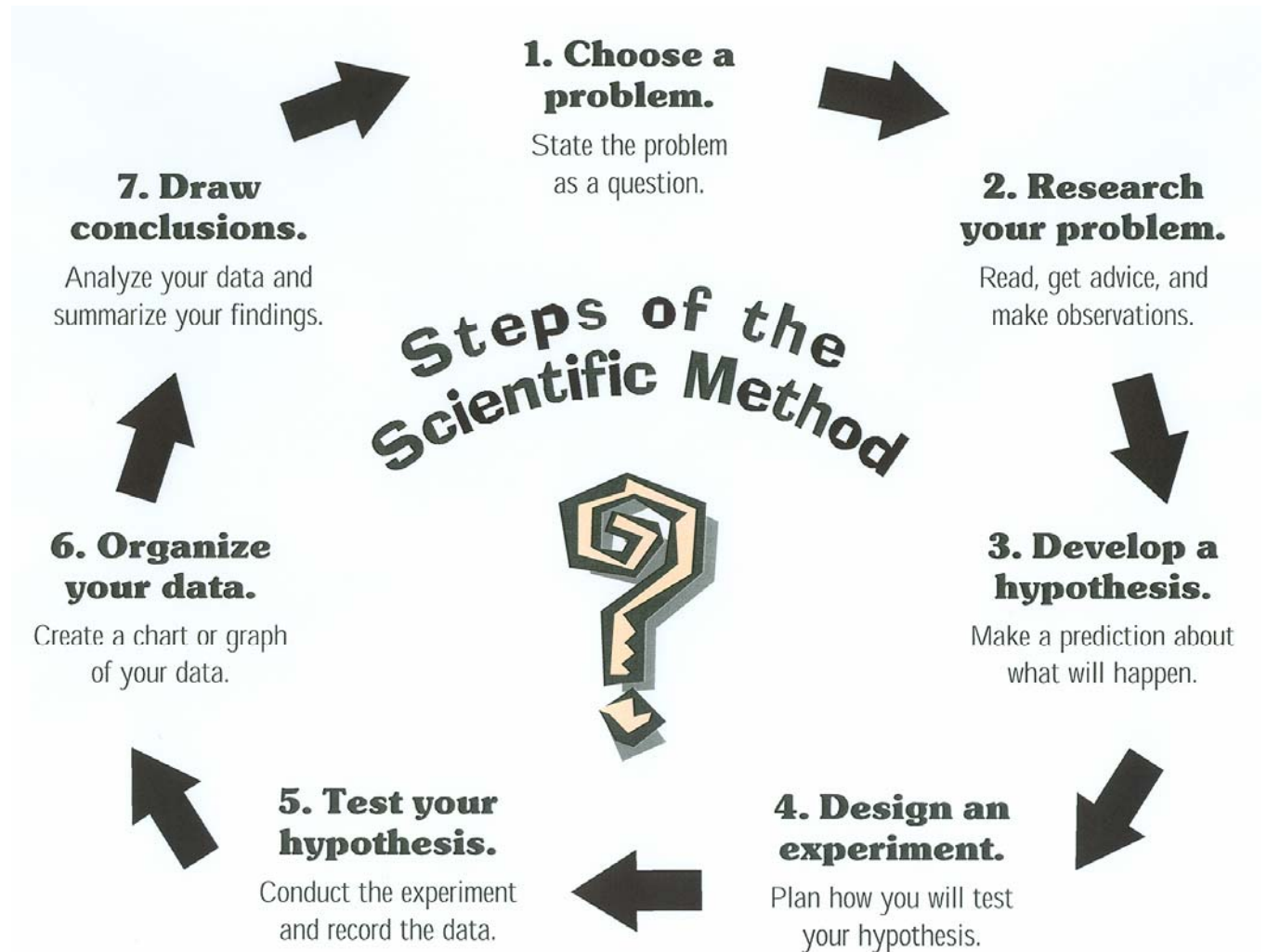
XI. EARTH'S CYCLES

- A. Water Cycle
- B. Rock Cycle
- C. Carbon Cycle
- D. Weather and Climate
- E. Pollution
- F. Greenhouse Effect
- G. Human Impacts

EMBEDDED TASK: "Solar Cooker" Laboratory Investigation

EMBEDDED TASK: "Connecticut Brownfield Sites" Science, Technology & Society

Introduction to Integrated Physical Science



COURSE: Integrated Physical Science
UNIT: Introduction to Integrated Physical Science
CONTACT: athompson@bridgeportedu.net
TIME FRAME: 1 week

CODE:
MAP LEVEL: 4
GRADE: 9

PERFORMANCE STANDARDS

SCIENCE - SCIENTIFIC INQUIRY (I)

- D.INQ.1 Students will identify questions that can be answered through scientific investigation.
- D.INQ.2 Students will read, interpret and examine the credibility and validity of scientific claims in different sources of information.
- D.INQ.3 Students will formulate a testable hypothesis and demonstrate logical connections between the scientific concepts guiding the hypothesis and the design of the experiment.
- D.INQ.4 Students will design and conduct appropriate types of scientific investigations to answer different questions.
- D.INQ.5 Students will identify independent and dependent variables, including those that are kept constant and those used as controls.
- D.INQ.6 Students will use appropriate tools and techniques to make observations and gather data.

SCIENCE - SCIENTIFIC INQUIRY (I)

- D.7 Students will assess the reliability of the data that was generated in the investigation.
- D.8 Students will use mathematical operations to analyze and interpret data, and present relationships between variables in appropriate forms.
- D.9 Students will articulate conclusions and explanations based on the results of the research, and assess their validity based on the design of the investigation.
- D.10 Students will communicate about science in different formats, using relevant science vocabulary, supporting evidence and clear logic.
-

ESSENTIAL/FOCUS QUESTIONS

Essential Questions

How is scientific knowledge created and communicated?

How is the scientific method used to better understand the world around us?

Focus Questions:

How does the process of science start and end?

What is the relationship between science and technology?

What are the branches of natural science?

What is the goal of a scientific method?
What are the characteristics of credible and valid scientific calculations?
How does scientific law differ from scientific theory?
Why are scientific models useful?
What is a safe laboratory?
Why is scientific notation useful?
What units do scientists use for their measurements?
How does the precision of measurement affect the precision of scientific calculations?
How do scientists organize data?
How can scientists communicate experimental data?

CONTENT

Explanation of science and technology
Use of the Scientific Method
Developing a Scientific Lab Report
Measurements
Scientific Data

SKILLS

Identify questions that can be answered through scientific investigations.
Explain how science and technology are related.
List the major branches of natural science and describe how they overlap.
Describe the main ideas of physical science.
Describe the steps in a scientific method.
Compare and contrast facts, scientific theories, and scientific law.
Identify the characteristics of a credible and valid scientific discovery.
Explain the importance of models in science.
Explain the importance of safety in science.
Identify the metric and SI units used in science and convert between common metric units.
Organize and analyze data using tables and graphs.
Identify the relationship between a manipulated variable and a responding variable (dependent and independent variables).

ASSURED EXPERIENCES

Science Fair Project

Determining the thickness of Aluminum Foil (Consumer Lab)

Measuring Volume and Temperature (Lab Manual)

ASSESSMENTS

Tests, Quizzes, Classroom Lab Activities

OPTIONAL ACTIVITIES

Guided Reading and Study Workbook with Math Support (Chapter 1)

RESOURCES

Textbook:

Physical Science Concepts in Action with Earth & Space – Prentice Hall
Chapter 1 pgs 1-31

Links:

[Graphing Power Point](#)

ADDITIONAL NOTES

Instructional Strategies

Create a climate for learning

Assess prior knowledge

Practice effective questioning techniques

Vary the structure of lessons

Vary the way students work

Use warm-up activities

Create and embed science, technology and society (STS) activities

Strengthen comprehension for content area text

Common assessments within and across all disciplines

Allow opportunities for peer review

Direct instruction

Classroom discussion

Graphic organizers

Cooperative learning strategies
Higher order level thinking skills
Outlines/drawings
Internet research
Integrate technology lessons/activities
Library research
Hands-on laboratory research skills
Laboratory activities
Audio-visual enhancements

VOCABULARY

Astronomy	Geology	Responding variable (dependent variable)
Biology	Graph	Science
Chemistry	Hypothesis	Scientific law
Conclusion	Inverse proportion	Scientific method
Controlled experiment	Length	Scientific notation
Conversion factor	Manipulated variable (independent variable)	Scientific theory
Data	Model	Slope
Density	Observation	Tables
Direct proportion	Physics	Technology
Forensic science	Procedure	Volume

Properties of Matter



THE EARTH IS ONE LARGE
MIXTURE OF MOLECULES IN
GASES, LIQUIDS AND SOLIDS.

COURSE: Integrated Physical Science
UNIT: Properties of Matter
CONTACT: athompson@bridgeportedu.net
TIME FRAME: 1st Marking Period

CODE:
MAP LEVEL: 4
GRADE: 9

PERFORMANCE STANDARDS

SCIENCE - SCIENTIFIC INQUIRY (I)

- D.INQ.1 Students will identify questions that can be answered through scientific investigation.
- D.INQ.2 Students will read, interpret and examine the credibility and validity of scientific claims in different sources of information.
- D.INQ.3 Students will formulate a testable hypothesis and demonstrate logical connections between the scientific concepts guiding the hypothesis and the design of the experiment.
- D.INQ.4 Students will design and conduct appropriate types of scientific investigations to answer different questions.
- D.INQ.5 Students will identify independent and dependent variables, including those that are kept constant and those used as controls.
- D.INQ.6 Students will use appropriate tools and techniques to make observations and gather data.

SCIENCE - SCIENTIFIC INQUIRY (I)

- D.INQ.7 Students will assess the reliability of the data that was generated in the investigation.
- D.INQ.8 Students will draw conclusions and identify sources of error.
- D.INQ.9 Students will articulate conclusions and explanations based on the results of the research, and assess their validity based on the design of the investigation.
- D.INQ.10 Students will communicate about science in different formats, using relevant science vocabulary, supporting evidence and clear logic.

SCIENCE - PHYSICAL SCIENCE (II, III, IV)

- D.INQ.1 Students will describe the effects of adding energy to matter, in terms of the motion of atoms and molecules, and the resulting phase changes.
- D.INQ.10 Students will describe the general structure of the atom, and explain how the properties of the first 10 elements in the Periodic Table are related to their atomic structure.

ESS/FOCUS QUESTIONS

Essential Questions:

- How do the physical and chemical properties of a substance affect its possible uses?
- How does the structure of matter affect the properties and uses of materials?

Focus Questions:

Why are elements and compounds classified as pure substances?

How do mixtures differ from pure substances?

What are some examples of physical properties?

When does a physical change occur?

What are some examples of chemical properties?

When can chemical properties be observed?

What observation might indicate that a chemical change has occurred?

What is the difference between a physical and chemical change?

How can shape and volume be used to classify materials?

What are the states of matter?

How can kinetic theory and forces of attraction be used to explain the behavior of solids, liquids and gases?

What are six common phase changes?

What happens to a substance's temperature and a system's energy during a phase change?

CONTENT

Classifying Matter

Physical Properties of Matter

Chemical Properties of Matter

Phases of Matter

Phase Changes

SKILLS

Classify pure substances as elements or compounds.

Describe the characteristics of an element and symbols used to identify elements.

Describe the characteristics of a compound.

Distinguish pure substances from mixtures.

Describe physical properties of matter.

Identify substances based on their physical properties.

Describe how properties are used to choose materials.

Describe evidence that indicates a physical is taking place.

Describe chemical properties of matter.

Describe clues that indicate that a chemical change has taken place.

Distinguish between chemical changes and physical changes.

Describe the states of matter.

Classify materials as solid liquids or gases.

Explain the behavior of solids liquids and gasses using kinetic theory.

Describe phase changes.

ASSURED EXPERIENCES

Science Fair Project

Investigating Changes in Temperature during Heating of Solids (Exploration Lab)

Using Properties to Identify Materials (Laboratory Manual)

ASSESSMENTS

Tests, Quizzes, Classroom Lab Activities

OPTIONAL ACTIVITIES

Guided Reading and Study Workbook with Math Support (Chapter 2, 3)

RESOURCES

Textbook:

Physical Science Concepts in Action with Earth & Space – Prentice Hall

Chapter 2 pgs 36-65

Chapter 3 pgs 66-97

United Video Streaming:

"Matter and Energy"

"Matter and Energy: How Is It Put Together"

"Discovering the Elements"

"Science Investigations: Physical Science: Investigating Chemical Properties"

ADDITIONAL NOTES

Instructional Strategies

Create a climate for learning

Assess prior knowledge

Practice effective questioning techniques

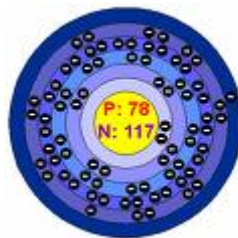
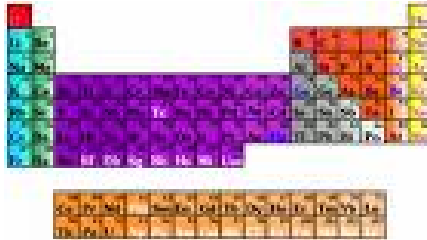
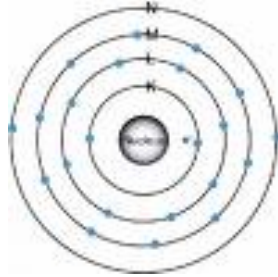
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Vary the structure of lessons
Vary the way students work
Use warm-up activities
Create and embed science, technology and society (STS) activities
Strengthen comprehension for content area text
Common assessments within and across all disciplines
Allow opportunities for peer review
Direct instruction
Classroom discussion
Graphic organizers
Cooperative learning strategies
Higher order level thinking skills
Outlines/drawings
Internet research
Integrate technology lessons/activities
Library research
Hands-on laboratory research skills
Laboratory activities
Audio-visual enhancements

VOCABULARY

Atom	Exothermic	Physical change
Boiling point	Filtration	Physical property
Bose - Einstein condensate	Flammability	Plasma
Chemical change	Gas	Precipitate
Chemical property	Heat of fusion	Pure substance
Colloid	Heat of vaporization	Reactivity
Compound	Heterogeneous mixture	Solid
Condensation	Homogenous mixture	Solution
Conductivity	Kinetic energy	Suspension
Distillation	Liquid	Temperature
Element	Malleability	Vapor pressure
Endothermic	Melting point	Vaporization
Evaporation	Phase change	Viscosity

Atomic Structure



COURSE: Integrated Physical Science
UNIT: Atomic Structure
CONTACT: athompson@bridgeportedu.net
TIME FRAME:

CODE:
MAP LEVEL: 4
GRADE: 9

PERFORMANCE STANDARDS

SCIENCE - SCIENTIFIC INQUIRY (I)

- D. INQ.1 Students will identify questions that can be answered through scientific investigation.
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SCIENCE - PHYSICAL SCIENCE (II, III, IV)

- D.INQ.10 Students will describe the general structure of the atom, and explain how the properties of the first 10 elements in the Periodic Table are related to their atomic structure.
 - D.INQ.11 Students will describe how atoms combine to form new substances by transferring electrons (ionic bonding) or sharing electrons (covalent bonding).
-

ESSENTIAL/FOCUS QUESTIONS

Essential Questions:

How does the structure of matter affect the properties and uses of materials?

What is Atomic Theory and how has it changed over time?

Focus Questions:

What was Dalton's theory of the structure of matter?

What contributions did Thomson and Rutherford make to the development of Modern Atomic Theory?

What are three subatomic particles?

What properties can be used to compare protons, neutrons, and electrons?

How are atoms of one element different from atoms of other elements?

What is the difference between isotopes of the same element?

What can happen to electrons when atoms gain or lose energy?

What type of model does a scientist use to describe how electrons behave in atoms?

What is the most stable configuration of electrons in an atom?

CONTENT

Development of atomic models and atomic theory

Structure of an atom

Modern Atomic Theory

SKILLS

List the main points of Dalton's atomic theory and describe his evidence for the existence of atoms.

Explain how Thomson and Rutherford used data from experiments to produce their atomic models.

Identify three subatomic particles and compare their properties.

Distinguish the atomic number of an element from the mass number of an isotope and use these numbers to describe the structure.

Describe Bohr's model of the atom and evidence for energy levels.

Explain how the electron cloud model represents behavior and locations of electrons in atoms.

Distinguish the ground state from excited states of an atom based on electron configurations.

ASSURED EXPERIENCES

Science Fair Project

Constructing Models of Atoms (Laboratory Manual)

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ASSESSMENTS

Tests, Quizzes, Classroom Lab Activities

OPTIONAL ACTIVITIES

Using Flame Tests (Laboratory Manual)

Guided Reading and Study Workbook with Math Support (Chapter 4)

RESOURCES

Textbook:

Physical Science Concepts in Action with Earth & Space – Prentice Hall

Chapter 4 pgs 98-123

ADDITIONAL NOTES

Instructional Strategies

Create a climate for learning

Assess prior knowledge

Practice effective questioning techniques

Vary the structure of lessons

Vary the way students work

Use warm-up activities

Create and embed science, technology and society (STS) activities

Strengthen comprehension for content area text

Common assessments within and across all disciplines

Allow opportunities for peer review

Direct instruction

Classroom discussion

Graphic organizers

Cooperative learning strategies

Higher order level thinking skills

Outlines/drawings

Internet research

Integrate technology lessons/activities

Bridgeport Public Schools 11/07

Library research

Hands-on laboratory research skills

Laboratory activities

Audio-visual enhancements

VOCABULARY

Atomic number

Isotopes

Atomic theory

Mass number

Atoms

Neutron

Electron

Nucleus

Electron cloud

Orbital

Electron configuration

Proton

Energy levels

Subatomic particles

Ground state

Periodic Table

Periodic Table of the Elements

1 IA New Original		2 IIA		3-10 IIIB IVB VB VIB VBIB VIII										11-12 IB IIB										13-18 IIIA IVA VA VIA VIIA VIIIA																																																																	
1 H Hydrogen 1.00794	2 He Helium 4.002602	3 Li Lithium 6.941	4 Be Beryllium 9.012182	5 B Boron 10.811	6 C Carbon 12.011	7 N Nitrogen 14.007	8 O Oxygen 15.999	9 F Fluorine 18.998	10 Ne Neon 20.180	11 Na Sodium 22.990	12 Mg Magnesium 24.305	13 Al Aluminum 26.982	14 Si Silicon 28.086	15 P Phosphorus 30.974	16 S Sulfur 32.06	17 Cl Chlorine 35.45	18 Ar Argon 39.948	19 K Potassium 39.098	20 Ca Calcium 40.078	21 Sc Scandium 44.956	22 Ti Titanium 47.887	23 V Vanadium 50.942	24 Cr Chromium 51.996	25 Mn Manganese 54.938	26 Fe Iron 55.845	27 Co Cobalt 58.933	28 Ni Nickel 58.693	29 Cu Copper 63.546	30 Zn Zinc 65.38	31 Ga Gallium 69.723	32 Ge Germanium 72.64	33 As Arsenic 74.922	34 Se Selenium 78.96	35 Br Bromine 79.904	36 Kr Krypton 83.798	37 Rb Rubidium 85.468	38 Sr Strontium 87.62	39 Y Yttrium 88.906	40 Zr Zirconium 91.224	41 Nb Niobium 92.906	42 Mo Molybdenum 95.94	43 Tc Technetium 98.906	44 Ru Ruthenium 101.07	45 Rh Rhodium 101.07	46 Pd Palladium 106.36	47 Ag Silver 107.868	48 Cd Cadmium 112.411	49 In Indium 114.818	50 Sn Tin 118.710	51 Sb Antimony 121.757	52 Te Tellurium 127.6	53 I Iodine 126.905	54 Xe Xenon 131.29	55 Cs Cesium 132.905	56 Ba Barium 137.327	57 to 71 Lanthanide series	72 Hf Hafnium 178.49	73 Ta Tantalum 180.9479	74 W Tungsten 183.84	75 Re Rhenium 186.207	76 Os Osmium 190.23	77 Ir Iridium 192.222	78 Pt Platinum 195.084	79 Au Gold 196.9665	80 Hg Mercury 200.59	81 Tl Thallium 204.384	82 Pb Lead 207.2	83 Bi Bismuth 208.9804	84 Po Polonium [209]	85 At Astatine [210]	86 Rn Radon [222]	87 Fr Francium [223]	88 Ra Radium [226]	89 to 103 Actinide series	104 Rf Rutherfordium [261]	105 Db Dubnium [262]	106 Sg Seaborgium [266]	107 Bh Bohrium [264]	108 Hs Hassium [277]	109 Mt Meitnerium [268]	110 Ds Darmstadtium [271]	111 Rg Roentgenium [272]	112 Uub Ununbium [285]	113 Uut Ununtrium [284]	114 Uuq Ununquadium [289]	115 Uup Ununpentium [288]	116 Uuh Ununhexium [289]	117 Uus Ununseptium [289]	118 Uuo Ununoctium [289]

Alkali metals: Yellow
Alkaline earth metals: Orange
Transition metals: Red
Lanthanide series: Purple
Actinide series: Blue
Poor metals: Green
Nonmetals: Light Green
Noble gases: Cyan
Solid: White
Liquid: Blue
Gas: Red
Synthetic: Black

Note: The subgroup numbers 1-18 were adopted in 1984 by the International Union of Pure and Applied Chemistry. The names of elements 112-118 are the Latin equivalents of those numbers.

COURSE: Integrated Physical Science
UNIT: The Periodic Table
CONTACT: athompson@bridgeportedu.net
TIME FRAME: 1st Marking Period

CODE:
MAP LEVEL: 4
GRADE: 9

PERFORMANCE STANDARDS

SCIENCE - SCIENTIFIC INQUIRY (I)

- D. INQ.1 Students will identify questions that can be answered through scientific investigation.
- D.INQ.2 Students will read, interpret and examine the credibility and validity of scientific claims in different sources of information.
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SCIENCE - SCIENTIFIC INQUIRY (I)

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- D.INQ.10 Students will communicate about science in different formats, using relevant science vocabulary, supporting evidence and clear logic.

SCIENCE - PHYSICAL SCIENCE (II, III, IV)

- D.10 Students will describe the general structure of the atom, and explain how the properties of the first 10 elements in the Periodic Table are related to their atomic structure.
 - D.11 Students will describe how atoms combine to form new substances by transferring electrons (ionic bonding) or sharing electrons (covalent bonding).
-

ESS/FOCUS QUESTIONS

Essential Questions:

How does the structure of matter affect the properties and uses of materials?

How is the periodic table organized and used to better understand the world around us?

Focus Questions:

- How is the modern Periodic Table organized?
- What does the atomic mass of an element depend upon?
- What categories are used to classify elements on the periodic table?
- How do the properties vary across a period in the Periodic Table?
- Why do the elements in a group have similar properties?
- What are some properties of Alkali Metals?
- What are some properties of Alkaline Metals?
- What are some properties of the Boron Family?
- What are some properties of the Carbon Family?
- What are some properties of the Nitrogen Family?
- What are some properties of the Halogens?
- What are some properties of the Noble Gases?
- How are the properties of the first 20 elements related to their Atomic Structure?
-

CONTENT

Periodic Law
Atomic Mass
Classes of Elements
Valence Electrons
The Alkali Metals
The Alkaline Earth Metals
The Boron Family
The Carbon Family
The Nitrogen Family
The Halogens
The Noble Gases

SKILLS

- Describe the arrangement of elements in the modern periodic table.
- Explain how the atomic mass of an element is determined and how atomic mass units are defined.
- Identify general properties of metals, nonmetal and metalloids.
- Describe how the properties of elements change across a period in the periodic table.
- Explain why elements in a group have similar properties.

Relate the number of valence electrons to groups in the Periodic Table and to the properties of elements in the group.

Predict the reactivity of some elements based on the locations within a group.

Describe some common properties of Alkali Metals.

Describe some common properties of Alkaline Earth Metals.

Describe some common properties of the Boron Family.

Describe some common properties of the Carbon Family.

Describe some common properties of the Nitrogen Family.

Describe some common properties of the Halogens.

Describe some common properties of the Noble Gases.

Explain how the properties of the first 20 elements of the Periodic Table are related to their atomic structure.

ASSURED EXPERIENCES

Science Fair Project

Predicting the Density of an Element (Exploration Lab)

Using Clues to Identify an Element (Laboratory Manual)

ASSESSMENTS

Tests, Quizzes, Classroom Lab Activities

OPTIONAL ACTIVITIES

Comparing Chemical Properties within a Group (Laboratory Manual)

Guided Reading and Study Workbook with Math Support (Chapter 5)

[Adopt An Element](#)

RESOURCES

Textbook:

Physical Science Concepts in Action with Earth & Space – Prentice Hall
Chapter 5 pgs 124-155

ADDITIONAL NOTES

Bridgeport Public Schools 11/07

Instructional Strategies

Create a climate for learning

Assess prior knowledge

Practice effective questioning techniques

Vary the structure of lessons

Vary the way students work

Use warm-up activities

Create and embed science, technology and society (STS) activities

Strengthen comprehension for content area text

Common assessments within and across all disciplines

Allow opportunities for peer review

Direct instruction

Classroom discussion

Graphic organizers

Cooperative learning strategies

Higher order level thinking skills

Outlines/drawings

Internet research

Integrate technology lessons/activities

Library research

Hands-on laboratory research skills

Laboratory activities

Audio-visual enhancements

VOCABULARY

Alkali metals

Alkaline earth metals

Atomic mass unit (AMU)

Group

Halogens

Metalloids

Metals

Noble Gases

Nonmetals

Period

Periodic Law

Periodic Table

Reactivity

Transition metals

Valence electrons

Chemical Bonds



COURSE: Integrated Physical Science
UNIT: Chemical Bonds
CONTACT: athompson@bridgeportedu.net
TIME FRAME: 2nd Marking Period

CODE:
MAP LEVEL: 4
GRADE: 9

PERFORMANCE STANDARDS

SCIENCE - SCIENTIFIC INQUIRY (I)

- D.INQ.1 Students will identify questions that can be answered through scientific investigation.
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SCIENCE - SCIENTIFIC INQUIRY (I)

- D.INQ.7 Students will assess the reliability of the data that was generated during the Investigation.
- D.INQ.8 Students will use mathematical operations to analyze and interpret data, and present relationships between variables in appropriate forms.
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- D.INQ.10 Students will communicate about science in different formats, using relevant science vocabulary, supporting evidence and clear logic.

SCIENCE - PHYSICAL SCIENCE (II, III, IV)

- D.INQ.11 Students will describe how atoms combine to form new substances by transferring electrons (ionic bonding) or sharing electrons (covalent bonding).

ESS/FOCUS QUESTIONS

Essential Questions:

How do atoms manage to stay together to form new substances?

Focus Questions:

When is an atom unlikely to react?

What is one way in which elements can achieve stable electron configuration?

How does the structure of an ionic compound affect its properties?

What is an ionic bond?

What is a covalent bond?

How are atoms held together in a covalent bond?

What are diatomic molecules?

What factors determine whether a molecule is polar?

How does the attraction between polar molecules compare to the attractions between non-polar molecules?

What are the forces that give a metal its structure as a solid?

How do metallic bonds produce some of the properties of metals?

What are alloys?

CONTENT

Ionic Bonds

Ionic Compounds

Stable Electron Configurations

Covalent Bonds

Unequal Sharing of Electrons

Attraction Between Molecules

Metallic bonds

Explanation of the properties of Metals

Alloys

SKILLS

Recognize stable electron configuration.

Predict an element's chemical properties using number of valence electrons and electron dot diagrams.

Describe ionic bonding.

Describe how an ion forms and how ionization energy affects the process.

Predict the composition of an ionic compound from its chemical formula.

Relate the properties of ionic compounds to the structure of crystal lattices.

Describe covalent bonding.

Describe how covalent bonds form and the attraction that keeps them together.

Compare polar and non-polar bonds, and demonstrate how polar bonds affect the polarity of a molecule.

Compare the attraction between polar and non polar molecules.

Describe metallic bonding.

Describe the structure and strength of bonds in metals.

Relate the properties of metals to their structure.

Define an alloy and demonstrate how the composition of an alloy affects its properties.

ASSURED EXPERIENCES

Science Fair Project

ASSESSMENTS

Tests, Quizzes, Classroom Lab Activities

OPTIONAL ACTIVITIES

Improving the Dying of Non-polar Fabrics (Laboratory Manual)

Comparing Ionic and Molecular Compounds (Laboratory Manual)

Guided Reading and Study Workbook with Math Support (Chapter 6)

RESOURCES

Textbook:

Physical Science Concepts in Action with Earth & Space– Prentice Hall
Chapter 6 pgs 156-189

United Streaming:

"Elements of Chemistry: Compounds and Reactions"

"Simply Science: Reaction Equations"

"Simply Science: Reaction Equations"

"Simply Science: Water: Highway of Life"

ADDITIONAL NOTES

Instructional Strategies

Create a climate for learning

Assess prior knowledge

Practice effective questioning techniques

Vary the structure of lessons

Vary the way students work

Use warm-up activities

Create and embed science, technology and society (STS) activities

Strengthen comprehension for content area text

Common assessments within and across all disciplines

Allow opportunities for peer review

Direct instruction

Classroom discussion

Graphic organizers

Cooperative learning strategies

Higher order level thinking skills

Outlines/drawings

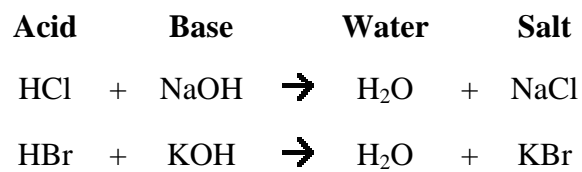
Bridgeport Public Schools 11/07

Internet research
Integrate technology lessons/activities
Library research
Hands-on laboratory research skills
Laboratory activities
Audio-visual enhancements

VOCABULARY

Alloy
Anion
Cation
Chemical bond
Chemical formula
Covalent bond
Crystal lattice
Crystals
Diatomic
Electron dot diagram
Ion
Ionic bond
Ionization energy
Metallic bond
Molecule
Orbitals
Polar covalent bond
Subscript
Valence electron

Acids and Bases



COURSE: Integrated Physical Science
UNIT: Acids and Bases
CONTACT: athompson@bridgeportedu.net
TIME FRAME: 2nd Marking Period

CODE:
MAP LEVEL: 4
GRADE: 9

PERFORMANCE STANDARDS

SCIENCE - SCIENTIFIC INQUIRY (I)

- D.INQ.1 Students will identify questions that can be answered through scientific investigation.
- D.INQ.2 Students will read, interpret and examine the credibility and validity of scientific claims in different sources of information.
- D.INQ.3 Students will formulate a testable hypothesis and demonstrate logical connections between the scientific concepts guiding the hypothesis and the design of the experiment.
- D.INQ.4 Students will design and conduct appropriate types of scientific investigations to answer different questions.
- D.INQ.5 Students will identify independent and dependent variables, including those that are kept constant and those used as controls.
- D.INQ.6 Students will use appropriate tools and techniques to make observations and gather data.

SCIENCE - SCIENTIFIC INQUIRY (I)

- D.INQ.7 Students will assess the reliability of the data that was generated in the investigation.
- D.INQ.8 Students will use mathematical operations to analyze and interpret data, and present relationships between variables in appropriate forms.
- D.INQ.9 Students will articulate conclusions and explanations based on the results of the research, and assess their validity based on the design of the investigation.
- D.INQ.10 Students will communicate about science in different formats, using relevant science vocabulary, supporting evidence and clear logic.

SCIENCE - PHYSICAL SCIENCE (II, III, IV)

- D.12 Students will explain the chemical composition of acids and bases, and explain the change of pH in neutralization reactions.

SCIENCE – SCIENCE & TECHNOLOGY IN SOCIETY (XI)

- D.21 Students will explain how the release of sulfur dioxide (SO₂) into the atmosphere can form acid rain, and how acid rain affects water sources, organisms and human-made structures.

ESSENTIAL/FOCUS QUESTIONS

Essential Questions:

How does the structure of matter affect the properties and uses of materials?

How do the physical and chemical properties of acids and bases make them so important?

Focus Questions:

What are some of the general properties of an acid?

How is acid rain different from pure water?

What are some of the general properties of a base?

How do strong acids and bases differ from weak acids and bases?

What is a neutralization reaction?

What is the pH scale?

How is pH used to describe the concentration of acids and bases?

What type of building materials are resistant to the effects of acid rain?

CONTENT

Properties of acids and bases

Strengths of acids and bases

pH scale

Neutralization Reactions

SKILLS

Describe how the physical properties of a solution can differ from those of its solute and solvent.

Identify energy changes that occur during the formation of a solution.

Describe the factors that affect the rate at which a solute dissolves in a solvent.

Define solubility and describe the factors affecting solubility.

Define acid and describe some of the general properties of an acid.

Define base and describe some of the general properties of a base.

Identify a neutralization reaction and identify the reactants and products of neutralization.

Define pH and explain how the pH scale is used.

Differentiate between strong acids and weak acids, strong bases and weak bases.

Explain what causes acid rain and describe some of the problems associated with the effects of acid rain.

Identify building materials that are resistant to the effects of acid rain

ASSURED EXPERIENCES

[EMBEDDED TASK: "ACID RAIN" LABORATORY INVESTIGATION Teacher](#)

[EMBEDDED TASK: "ACID RAIN" LABORATORY INVESTIGATION Student](#)

ASSESSMENTS

Tests, Quizzes, Classroom Lab Activities

OPTIONAL ACTIVITIES

Guided Reading and Study Workbook with Math Support (Chapters 8)

Comparing Antacids (Laboratory Manual)

Preparing a Salt by Neutralization (Laboratory Manual)

Optional Instruction:

Formation of Solutions, Section 8.1

Solubility & Concentration, Section 8.2

Optional Focus Questions:

What is a solution?

What are the different types of solutions?

What is solubility?

What are the two basic parts of a solution?

What factors affect the rate at which a solute dissolves in a solvent?

RESOURCES

Textbook:

Physical Science Concepts in Action with Earth & Space – Prentice Hall

Chapter 8

Section 8.3 page 240 - 245

Section 8.4 page 246 - 255

Chapter 9

Section 9.1 page 269 (Acid Rain)

United Streaming:

"Chemistry Connections: Acid-Base Calculations"

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"Chemistry Connections: Acid-Base Indicators"

"Chemistry Connections: Acid-Base Technology and Society"

"Chemistry Connections: Acids and Bases Defined"

[Acid Rain Model Lab](#)

ADDITIONAL NOTES

Instructional Strategies

Create a climate for learning

Assess prior knowledge

Practice effective questioning techniques

Vary the structure of lessons

Vary the way students work

Use warm-up activities

Create and embed science, technology and society (STS) activities

Strengthen comprehension for content area text

Common assessments within and across all disciplines

Allow opportunities for peer review

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Outlines/drawings

Internet research

Integrate technology lessons/activities

Library research

Hands-on laboratory research skills

Laboratory activities

Audio-visual enhancements

VOCABULARY

Acid

Base

Buffer

Electrolyte

Indicator

Neutralization

ph scale

Salt

Saturated solution

Solubility

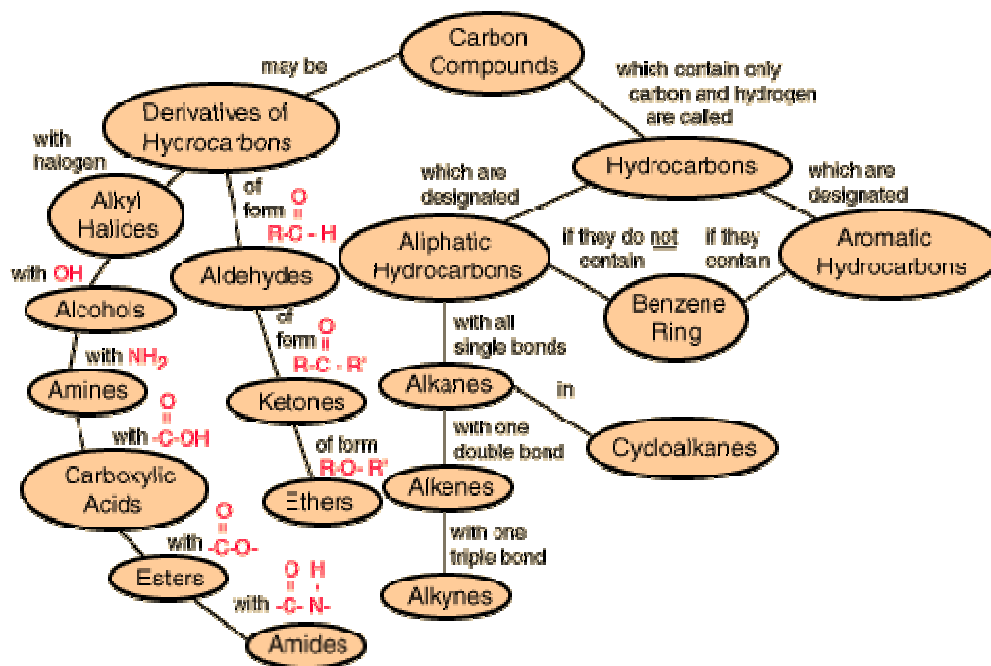
Solute

Solution

Solvent

Unsaturated solution

Carbon Chemistry



COURSE: Integrated Physical Science
UNIT: Carbon Chemistry
CONTACT: athompson@bridgeportedu.net
TIME FRAME: 2nd Marking Period

CODE:
MAP LEVEL: 4
GRADE: 9

PERFORMANCE STANDARDS

SCIENCE - SCIENTIFIC INQUIRY (I)

- D.INQ.1 Students will identify questions that can be answered through scientific investigation.
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- D.INQ.5 Students will identify independent and dependent variables, including those that are kept constant and those used as controls.
- D.INQ.6 Students will use appropriate tools and techniques to make observations and gather data.

SCIENCE - SCIENTIFIC INQUIRY (I)

- D.INQ.7 Students will assess the reliability of the data that was generated in the investigation.
- D.INQ.8 Students will use mathematical operations to analyze and interpret data, and present relationships between variables in appropriate forms.
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- D.INQ.10 Students will communicate about science in different formats, using relevant science vocabulary, supporting evidence and clear logic.

SCIENCE - PHYSICAL SCIENCE (II, III, IV)

- D.INQ.13 Students will explain how the structure of the carbon atom affects the type of bonds it forms in organic and inorganic molecules.
- D.INQ.14 Students will describe combustion reactions of hydrocarbons and their resulting by-products.
- D.INQ.15 Students will explain the general formation and structure of carbon-based polymers, including synthetic polymers such as polyethylene and biopolymers such as carbohydrate.

SCIENCE – SCIENCE & TECHNOLOGY IN SOCIETY (XI)

- D.INQ.16 Students will explain how simple chemical monomers can be combined to create linear, branched and/or cross-linked polymers.

- D.INQ.17 Students will explain how the chemical structure of polymers affects their physical properties (strength, flexibility).
- D.INQ.24 Students will explain the short-and long-term impacts of landfills and incineration of waste materials on the quality of the environment.
- D.INQ.22 Students will explain how the accumulation of carbon dioxide (CO₂) in the atmosphere increases Earth's 'greenhouse' effect and may cause climate changes.

SCIENCE - EARTH SCIENCE (VIII, IX, X)

- D.INQ.18 Students will explain how chemical and physical processes drive carbon to cycle through the major Earth reservoirs.
-

ESSENTIAL/FOCUS QUESTIONS

Essential Questions:

- How does the structure of matter affect the properties and uses of materials?
- How does science and technology affect the quality of our lives?
- How do the physical and chemical properties of carbon make it so important?

Focus Questions:

- How does the structure of a carbon atom make it a unique element?
- How does the structure of a carbon atom affect the type of bonds it forms?
- What is an organic compound?
- What are hydrocarbons?
- What are the products and by products of the combustion of hydrocarbons?
- What are some of the important uses of carbon based compounds?
- What is the structure of carbon based polymers?
- How are synthetic polymers produced?
- How are carbon based polymers classified and formed?
- How do monomers combine to create polymers?
- How does the structure of polymers affect their physical properties?
- What materials can be produced from the cracking of petroleum?
- What are plastics?
- What are fossil fuels?
- What are some important petroleum products?
- How are saturated hydrocarbons different from unsaturated hydrocarbons?
- How does the accumulation of carbon dioxide impact our environment?

CONTENT

Carbon

Carbon compounds

Substituted Hydrocarbons

Polymers

Fossil Fuels

Global Warming

SKILLS

Relate the structures of the three forms of carbon to their properties.

Explain how carbon atoms bond in various ways.

Explain why there are many different types of organic compounds.

Describe the combustion of hydrocarbons.

List some of the uses of carbon based compounds.

Differentiate unsaturated from saturated hydrocarbons.

Identify the important materials that result from the cracking of petroleum.

Explain the short and long impacts of landfills and incineration of waste materials on the quality of the environment.

Describe the formation, composition, and uses of three types of fossil fuels.

Differentiate complete combustion of fossil fuels from incomplete combustion.

Describe the effects of some products of the combustion of fossil fuels.

Explain the greenhouse effect and the impact that it has upon our environment.

Explain how a monomer is different from a polymer.

Explain the general formation and structure of carbon based polymers.

Explain how monomers and polymers can be combined.

Describe three types of synthetic polymers.

Describe the structures and functions of four types of natural polymers.

ASSURED EXPERIENCES

[EMBEDDED TASK: "SYNTHETIC POLYMERS" LABORATORY INVESTIGATION Teacher](#)

[EMBEDDED TASK: "SYNTHETIC POLYMERS" LABORATORY INVESTIGATION Student](#)

[EMBEDDED TASK: "SYNTHETIC POLYMERS STS" Teacher](#)
[EMBEDDED TASK: "SYNTHETIC POLYMERS STS" Student](#)

Concepts in Action: "Breathing Easy" Chapter 9, page 271

ASSESSMENTS

Tests, Quizzes, Classroom Lab Activities

OPTIONAL ACTIVITIES

Guided Reading and Study Workbook with Math Support (Chapters 9)

Construction of a Bridgeport recycling poster

Comparing cross-linked polymers (Laboratory Manual)

Marshmallow (Polymer) Lab, see below

RESOURCES

Textbook:

Physical Science Concepts in Action with Earth & Space – Prentice Hall

Chapter 9 page 260-289

United Streaming:

"Elements of Chemistry: Carbon: The Element of Life"

"Simply Science: Combustion and Replacement Reactions"

"Earth Science: Conservation of Natural Resources"

"Garbage Story, The: Dealing with Solid Waste Disposal"

"Invention: Recycling"

Links:

[Polymers, They're Everywhere](#)
[Marshmallow Polymer Lab](#)

ADDITIONAL NOTES

Instructional Strategies

Create a climate for learning

Assess prior knowledge

Practice effective questioning techniques

Vary the structure of lessons

Vary the way students work

Bridgeport Public Schools 11/07

Use warm-up activities
Create and embed science, technology and society (STS) activities
Strengthen comprehension for content area text
Common assessments within and across all disciplines
Allow opportunities for peer review
Direct instruction
Classroom discussion
Graphic organizers
Cooperative learning strategies
Higher order level thinking skills
Outlines/drawings
Internet research
Integrate technology lessons/activities
Library research
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Laboratory activities
Audio-visual enhancements

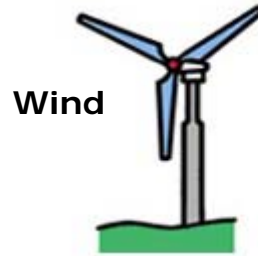
VOCABULARY

Complete combustion	Saturated Hydrocarbon
Cracking	Synthetic Polymer
Cross linked polymers	Unsaturated Hydrocarbon
Fossil Fuels	
Hydrocarbon	
Incomplete combustion	
Landfill	
Monomer	
Natural polymer	
Organic compound	
Petroleum	
Plastic	
Polymer	

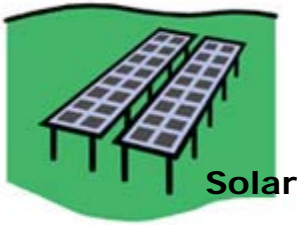
Energy Forms and Changes



Fossil Fuel



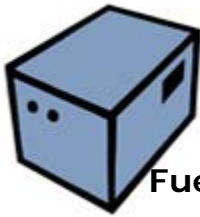
Wind



Solar



Nuclear



Fuel Cell



Biomass



Hydroelectric

COURSE: Integrated Physical Science
UNIT: Energy Forms and Changes
CONTACT: athompson@bridgeportedu.net
TIME FRAME: 3RD Marking Period

CODE:
MAP LEVEL: 4
GRADE: 9

PERFORMANCE STANDARDS

SCIENCE - SCIENTIFIC INQUIRY (I)

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SCIENCE - SCIENTIFIC INQUIRY (I)

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- D.INQ.10 Students will communicate about science in different formats, using relevant science vocabulary, supporting evidence and clear logic.

SCIENCE - PHYSICAL SCIENCE (II, III, IV)

- D.INQ.1 Students will describe the effects of adding energy to matter, in terms of the motion of atoms and molecules, and the resulting phase changes.
- D.INQ.2 Students will explain how energy transfers from hotter to cooler objects by conduction, convection and radiation.
- D.INQ.3 Students will describe energy transformations among heat, light, electricity and motion.

SCIENCE - SCI & TECH IN SOCIETY (XI)

- D.INQ.7 Students will explain how heat is used to generate electricity.
- D.INQ.8 Students will describe the availability, current uses and environmental issues related to the use of fossil and nuclear fuels to produce electricity.
- D.INQ.9 Students will describe the availability, current uses and environmental issues related to the use of hydrogen fuel cells, wind and solar energy to produce electricity.

Essential/Focus Questions

Essential Questions:

What is the role of energy in our world?

How is the utilization of energy dependent upon its ability to adopt different states and forms?

Focus Questions:

What is energy?

How is energy conserved?

What are the major forms of energy?

How can energy be converted from one form to another?

How is matter affected by heat energy?

How is heat energy transferred?

How is energy related to phase change?

How do we heat our homes?

What forms of energy are available to harness for power?

CONTENT

Energy Forms

Thermal Energy

Conservation of Energy

Energy Conversions

Energy Resources

SKILLS

Give examples of the major forms of energy and explain how each is produced.

Describe conversions of energy from one form to another.

State and apply the Law of Conservation of Energy.

Classify energy resources as renewable and nonrenewable.

Relate thermal energy to the motion of particles that make up a material.

Describe conduction, convection, and radiation.

Describe how different types of heating systems work.

Identify solar energy as the primary source of energy on earth.

Explain how solar energy is converted to other forms of energy on earth.

Differentiate between kinetic and potential energy.

ASSURED EXPERIENCES

"Keep It Hot": Former CAPT Lab

ASSESSMENTS

Tests, Quizzes, Classroom Lab Activities

OPTIONAL ACTIVITIES

Guided Reading and Study Workbook with Math Support (Chapter 15, 16)

Determining the kinetic energy of a pendulum. (Laboratory Manual)

Determining the effect of surface area on heat transfer. (Laboratory Manual)

RESOURCES

Textbook:

Physical Science Concepts in Action with Earth & Space – Prentice Hall
Chapter 15 pgs 444-471

United Streaming:

"Elements of Physics: Energy: Work and Power"

"Matter and Energy: Energy: What Is It?"

"Matter and Energy: Matter: What Is It?"

"Physics: A World in Motion: Energy Transformation"

Article:

[Waste to Energy Article](#)

Power Point:

[ENERGY.pt1.ppt](#)

[HEAT TRANSFER.ppt](#)

ADDITIONAL NOTES

Instructional Strategies

Create a climate for learning

Assess prior knowledge

Practice effective questioning techniques

Vary the structure of lessons

Vary the way students work

Use warm-up activities

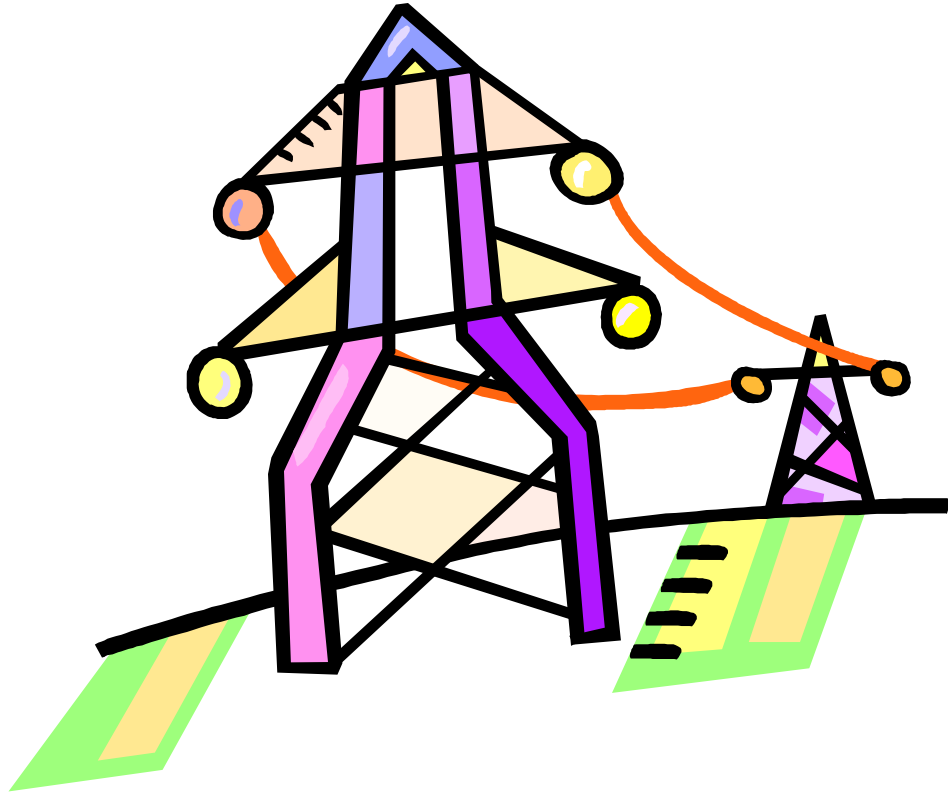
Bridgeport Public Schools 11/07

Create and embed science, technology and society (STS) activities
Strengthen comprehension for content area text
Common assessments within and across all disciplines
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Classroom discussion
Graphic organizers
Cooperative learning strategies
Higher order level thinking skills
Outlines/drawings
Internet research
Integrate technology lessons/activities
Library research
Hands-on laboratory research skills
Laboratory activities
Audio-visual enhancements

VOCABULARY

Chemical energy	Kinetic energy
Conduction	Mechanical energy
Convection	Nuclear energy
Electrical energy	Potential energy
Electromagnetic energy	Radiation
Energy	Solar energy
Energy Conversion	Temperature
Heat	Thermal energy

Electricity



COURSE: Integrated Physical Science
UNIT: Electricity
CONTACT: athompson@bridgeportedu.net
TIME FRAME: 3rd Marking Period

CODE:
MAP LEVEL: 4
GRADE: 9

PERFORMANCE STANDARDS

SCIENCE - SCIENTIFIC INQUIRY (I)

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- D.INQ.10 Students will communicate about science in different formats, using relevant science vocabulary, supporting evidence and clear logic.

SCIENCE - PHYSICAL SCIENCE (II, III, IV)

- D.INQ.4 Students will calculate the voltage, current and resistance in a simple series circuit using Ohms Law.

D.INQ.5 Students will explain how electricity is used to produce heat and light in incandescent bulbs and heating elements.

SCIENCE - SCI & TECH IN SOCIETY (XI)

D.INQ.7 Students will explain how heat is used to generate electricity.

ESS/FOCUS QUESTIONS

Essential Questions:

What is the role of energy in our world?

How is the utilization of energy dependent upon its ability to be transformed and transferred?

Focus Questions:

What is static charge and how can it be created and transferred?

What is an electric current?

What is an electrical conductor?

What is an electrical insulator?

Using Ohm's Law, how is voltage calculated?

Using Ohm's Law, how is current calculated?

Using Ohm's Law, how is resistance calculated?

What is an electric circuit?

What is the difference between series and parallel circuits?

How can Ohm's Law be used to develop electric circuits?

What causes lightning?

What is an electrical force?

How does a battery enable a flashlight to light?

CONTENT

Electric Charge

Electric Forces

Electric Fields

Static Electricity

Electric Current

Insulators and Conductors

Ohm's Law and Electric Circuits

SKILLS

Explain how and why an object becomes electrically charged.

Describe how electric charges are transferred and explain why electric discharge occurs.

Describe the two types of electric current.

Explain what an electrical conductor and an electrical insulator are.

Design and construct a simple electrical circuit.

Calculate voltage, current, and resistance using Ohm's Law.

Differentiate series and parallel circuits.

Explain how electricity can be converted to light and heat energy.

ASSURED EXPERIENCES

Lab Investigation: Constructing A Simple Circuit

ASSESSMENTS

Tests, Quizzes, Classroom Lab Activities

OPTIONAL ACTIVITIES

Guided Reading and Study Workbook with Math Support (Chapter 20)

RESOURCES

Textbook:

Physical Science Concepts in Action with Earth and Space – Prentice Hall
Chapter 20 pgs 598-625

United Streaming:

"Electricity's Attraction"

"Physics: A World in Motion: Current Electricity"

"Understanding Electricity"

Power Point:

[Electricity Power Point](#)

ADDITIONAL NOTES

Instructional Strategies

Create a climate for learning

Assess prior knowledge

Bridgeport Public Schools 11/07

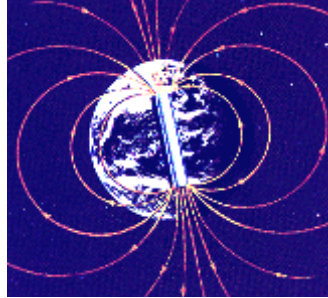
Practice effective questioning techniques
Vary the structure of lessons
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Higher order level thinking skills
Outlines/drawings
Internet research
Integrate technology lessons/activities
Library research
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Laboratory activities
Audio-visual enhancements

VOCABULARY

Alternating Current	Electronics
Battery	Fuse
Conductor	Insulator
Direct Current	Ohm's Law
Electric Charge	Parallel Circuit
Electric Circuit	Resistance
Electric Current	Series Circuit
Electric Field	Static Electricity
Electric Force	Voltage

Magnetism and Power Generation

The Magnetosphere



Clean Power Generation



Solar Power Generation



Nuclear Power Generation



COURSE: Integrated Physical Science
UNIT: Magnetism and Power Generation
CONTACT: athompson@bridgeportedu.net
TIME FRAME: 3rd Marking Period

CODE:
MAP LEVEL: 4
GRADE: 9

PERFORMANCE STANDARDS

SCIENCE - SCIENTIFIC INQUIRY (I)

- D.INQ.1 Students will identify questions that can be answered through scientific investigation.
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27.1 SCIENCE - SCIENTIFIC INQUIRY (I)

- D.INQ.7 Students will assess the reliability of the data that was generated in the investigation.
- D.INQ.8 Students will use mathematical operations to analyze and interpret data, and present relationships between variables in appropriate forms.
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- D.INQ.10 Students will communicate about science in different formats, using relevant science vocabulary, supporting evidence and clear logic.

SCIENCE - PHYSICAL SCIENCE (II, III, IV)

- D.INQ.6 Students will describe the relationship between current and magnetism.
-

ESSENTIAL/FOCUS QUESTIONS

Essential Questions:

What is the role of energy in our world?

How is electrical energy produced, transmitted, and converted for use in the home?

Focus Questions:

What is a magnetic field?

How are magnetic fields produced?

What are magnets and why do they behave the way they do?
How are energy and magnetism related?
How does a compass work?
How is an electric current generated with the use of magnets?
How does a generator operate?
How does an electric motor operate?
What is electromagnetism and why is it important?
What forms of energy are used to generate power and electricity?
How does electric current get to your home?
Why is there a North and South Pole?

CONTENT

Magnetic forces and fields

Magnetic materials

Electricity and magnetism

Electromagnets

Generating electrical current

Electrical energy and your home

SKILLS

Describe the effects of magnetic forces and magnetic fields.

Explain how magnetic poles determine the direction of magnetic forces.

Explain how heat is used to generate electricity.

Describe the Earth's magnetic field and its effect on a compass.

Describe the advantages and disadvantages of using fossil and nuclear fuels to produce electricity.

Describe the advantages and disadvantages of using fuel cycles, wind and solar to produce electricity.

Explain the behavior of ferromagnetic materials in terms of magnetic domains.

Describe how matter is transformed into energy during nuclear fission.

Describe how a moving electric charge can create a magnetic field.

Explain how an electromagnet can be constructed.

Explain how a generator works.

Summarize how electrical energy is produced, transmitted, and converted for use in the home.

ASSURED EXPERIENCES

[EMBEDDED TASK: "ENERGY USES IN CONNECTICUT STS" Teacher](#)

[EMBEDDED TASK: "ENERGY USES IN CONNECTICUT STS" Student](#)

ASSESSMENTS

Tests, Quizzes, Classroom Lab Activities

OPTIONAL ACTIVITIES

Guided Reading and Study Workbook with Math Support (Chapter 21)

RESOURCES

Textbook:

Physical Science Concepts in Action with Earth & Space – Prentice Hall
Chapter 21pgs 628-653

United Streaming:

"Physical Science: Magnetism"

Power Point:

[Magnetism Power Point](#)

ADDITIONAL NOTES

Instructional Strategies

Create a climate for learning

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Strengthen comprehension for content area text

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Direct instruction

Classroom discussion

Graphic organizers

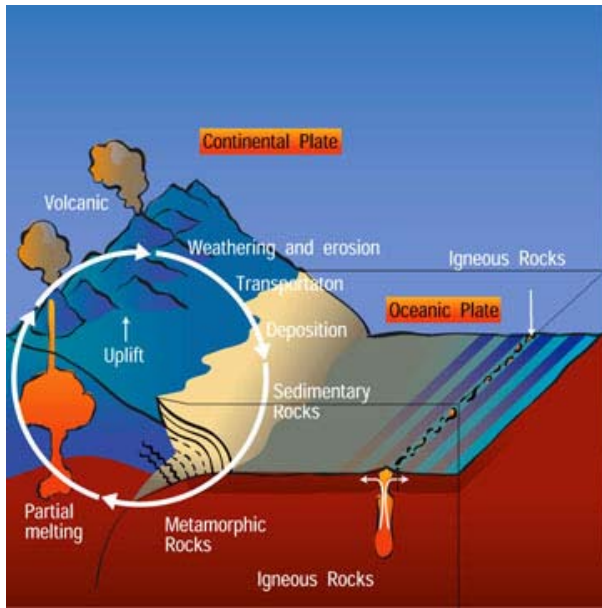
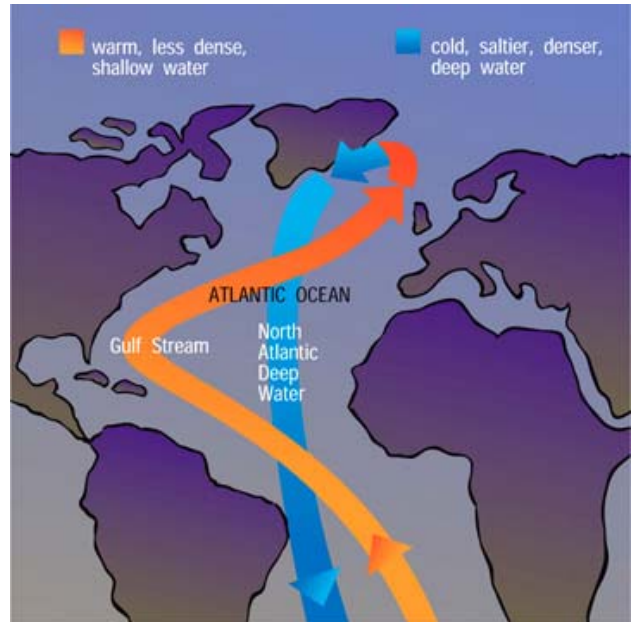
Cooperative learning strategies
Higher order level thinking skills
Outlines/drawings
Internet research
Integrate technology lessons/activities
Library research
Hands-on laboratory research skills
Laboratory activities
Audio-visual enhancements

VOCABULARY

Electric Motor
Electromagnet
Ferromagnetic Material
Fuel cells
Generator
Magnetic Domain
Magnetic Field
Magnetic Force
Magnetic Pole
Nuclear fission
Transformer
Turbine

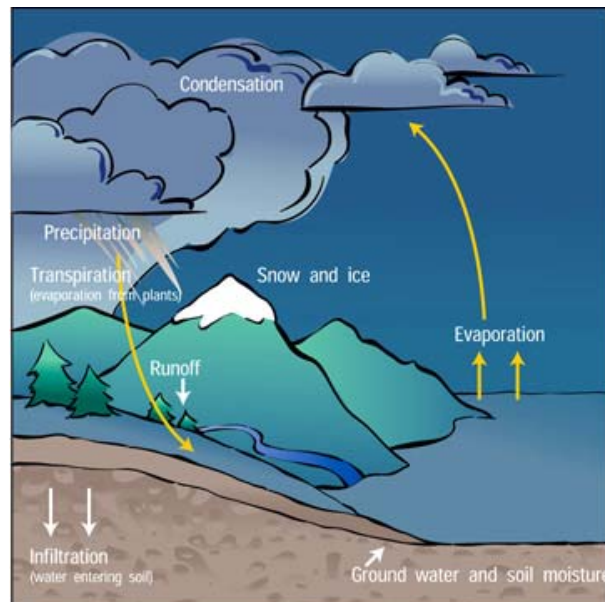
Earth's Cycles

The Ocean Motion



The Rock Cycle

The Water Cycle



PERFORMANCE STANDARDS

SCIENCE - SCIENTIFIC INQUIRY (I)

- D.INQ.1 Students will identify questions that can be answered through scientific investigation.
- D.INQ.2 Students will read, interpret and examine the credibility and validity of scientific claims in different sources of information.
- D.INQ.3 Students will formulate a testable hypothesis and demonstrate logical connections between the scientific concepts guiding the hypothesis and the design of the experiment.
- D.INQ.4 Students will design and conduct appropriate types of scientific investigations to answer different questions.
- D.INQ.5 Students will identify independent and dependent variables, including those that are kept constant and those used as controls.
- D.INQ.6 Students will use appropriate tools and techniques to make observations and gather data.

SCIENCE - SCIENTIFIC INQUIRY (I)

- D.INQ.7 Students will assess the reliability of the data that was generated in the investigation.
- D.INQ.8 Students will use mathematical operations to analyze and interpret data, and present relationships between variables in appropriate forms.
- D.INQ.9 Students will articulate conclusions and explanations based on the results of the research, and assess their validity based on the design of the investigation.
- D.INQ.10 Students will communicate about science in different formats, using relevant science vocabulary, supporting evidence and clear logic.

SCIENCE - EARTH SCIENCE (VIII, IX, X)

- D.INQ.18 Students will explain how chemical and physical processes drive carbon to cycle through the major Earth reservoirs.
- D.INQ.19 Students will explain how solar energy drives water to cycle through the major Earth reservoirs.
- D.INQ.20 Students will explain how internal energy of the Earth drives matter to cycle through the magma and the solid Earth.

SCIENCE - SCI & TECH IN SOCIETY (XI)

- D.INQ.24 Students will explain the short-and long-term impacts of landfills and incineration of waste materials on the quality of the environment.
- D.INQ.21 Students will explain how the release of sulfur dioxide (SO₂) into the atmosphere can form acid rain, and how acid rain affects water sources, organisms and human-made structures.

- D.INQ.22 Students will explain how the accumulation of carbon dioxide (CO₂) in the atmosphere increases Earth's 'greenhouse' effect and may cause climate changes.
- D.INQ.23 Students will explain how the accumulation of mercury, phosphates and nitrates affects the quality of water and the organisms that live in rivers, lakes and oceans.
- D.INQ.25 Students will explain how housing development, transportation options and consumption of resources may affect the environment.
- D.INQ.26 Students will describe human efforts to reduce the consumption of raw materials and improve air and water quality.
-

ESSENTIAL/FOCUS QUESTIONS

Essential Questions:

How do science and technology affect the quality of our lives?
How do our actions impact the environment?

Focus Questions:

What makes the Earth work the way it does?
How are materials cycled through the Earth's systems?
How do elements on the Earth move through biochemical cycles?
Where are life's important elements found?
What drives the Earth's cycles?
What is the relationship between solar energy and the water cycle?
How does the Earth's internal energy affect the cycle of materials on Earth?
How does the use of resources by humans affect the environment?
What are the major sources of air, water and land pollution?
How is the Earth changing?
How do mercury, phosphates and nitrate affect water quality?

CONTENT

Earth's Physical and Chemical Structure

The Water Cycle

Weathering and Erosion

The Atmosphere

Energy in the Atmosphere

Solar Energy and Weather

SKILLS

Describe the main layers of the Earth.

Classify rocks as igneous, sedimentary, or metamorphic and explain how different types of rocks are formed.

Differentiate between chemical and mechanical weathering and describe the factors that affect the rate of weathering.

Describe how matter cycles through various reservoirs on earth.

Describe the Earth's atmosphere and explain how it is essential for life.

Describe the processes by which solar energy heats the atmosphere.

Describe the role of the water cycle.

Identify materials that can be recycled.

Identify the major sources of land air and water pollution.

Explain how pollution affects the environment.

List ways in which mercury, phosphates and nitrate affect water quality.

Explain how new technologies can have positive and / or negative effects on the environment.

Describe how science and technology offer solutions to environmental problems.

Explain how energy drives the earth's cycles.

ASSURED EXPERIENCES

[EMBEDDED TASK: "CONNECTICUT BROWNFIELD SITES" Teacher](#)

[EMBEDDED TASK: "CONNECTICUT BROWNFIELD SITES" Student](#)

[EMBEDDED TASK: "SOLAR COOKER" Teacher](#)

[EMBEDDED TASK: "SOLAR COOKER" Student](#)

ASSESSMENTS

Tests, Quizzes, Classroom Lab Activities

OPTIONAL ACTIVITIES

Guided Reading and Study Workbook with Math Support (Chapters 22-24)

Modeling Petroleum Recovery (Laboratory Manual)

Modeling Global Warming (Laboratory Manual)

RESOURCES

Textbook:

Bridgeport Public Schools 11/07

Power Point:

[Watersheds.ppt](#)

[Water Cycle.ppt](#)

[Pollution.ppt](#)

[Earth's Cycles.ppt](#)

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Library research

Hands-on laboratory research skills

Laboratory activities

Audio-visual enhancements

VOCABULARY

Aquifer
Atmosphere
Chemical Weathering
Climate
Condensations
Core
Crust
Erosion
Geology
Glacier
Global Warming
Greenhouse Effect

Groundwater
Hydrosphere
Igneous Rock
Lithosphere
Mantle
Mechanical Weathering
Metamorphic Rock
Mineral
Physical Weathering
Pollutant
Precipitation
Revolution

Rock
Rock Cycle
Rotation
Sedimentary Rock
Sedimentation
Technology
Transpiration
Troposphere
Water Cycle
Watershed
Weather
Weathering