

**Indiana High School Science  
Curriculum Mapping**

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Chemistry, 2010	Boardworks High School Chemistry Presentation
<b>Standard 1: Properties and States of Matter</b>	
C.1.1 Based on physical properties, differentiate between pure substances and mixtures.	–
C.1.2 Observe and describe chemical and physical properties of different types of matter and designate them as either extensive or intensive.	–
C.1.3 Recognize observable indicators of chemical changes.	Endothermic Reactions Exothermic Reactions
C.1.4 Describe physical and chemical changes at the molecular level.	Ionic Bonding Covalent Bonding Separating Mixtures Endothermic Reactions Exothermic Reactions Bonds and Activation Energy
C.1.5 Describe the characteristics of solids, liquids, and gases and state changes at the molecular level.	Changing State Particles in Action
C.1.6 Explain and apply the law of conservation of mass as it applies to chemical processes.	Conservation of Mass
C.1.7 Define density and distinguish among materials based on densities. Perform calculations involving density.	–
<b>Standard 2: Atomic Structure and the Periodic Table</b>	
C.2.1 Describe how models of atomic structure changed over time based on available experimental evidence and understand the current model of atomic structure.	Introducing Atoms
C.2.2 Describe how the subatomic particles (protons, neutrons, and electrons) contribute to the structure of an atom and recognize that the particles within the nucleus are held together against the electrical repulsion of the protons.	Atomic Structure
C.2.3 Determine the number of protons, neutrons, and electrons in isotopes and in those isotopes that comprise a specific element. Relate these numbers to atomic number and mass number.	Atomic Number and Mass Number Isotopes
C.2.4 Calculate the average atomic mass of an element from isotopic abundance data.	Relative Atomic Mass
C.2.5 Write the electron configuration of an element and relate this to its position on the periodic table.	Electron Configuration Electron Structure and the Periodic Table The Periodic Table

C.2.6 Use the periodic table and electron configurations to determine an element's number of valence electrons, and chemical and physical properties.	Electron Configuration Electron Structure and the Periodic Table The Periodic Table
C.2.7 Compare and contrast nuclear reactions with chemical reactions. For nuclear reactions, describe how the fusion and fission processes transform elements present before the reaction into elements present after the reaction.	Nuclear Fission Nuclear Fusion
C.2.8 Understand that the radioactive decay process is random for any given atom, but that this property leads to a predictable and measurable exponential decay of a sample of radioactive material. Calculate the initial amount, the fraction remaining, or the half-life of a radioactive isotope, given two of the three variables.	Half-life Radioactivity Radioactive Dating
<b>Standard 3: Bonding and Molecular Structure</b>	
C.3.1 Describe, compare, and contrast the characteristics of the interactions between atoms in ionic and covalent compounds.	Giant Covalent Compounds Ionic Compounds
C.3.2 Compare and contrast how ionic and covalent compounds form.	Ionic Bonding Covalent Bonding
C.3.3 Compare and contrast ionic, covalent network, metallic and polar and non-polar molecular crystals with respect to constituent particles, strength of bonds, melting and boiling points and conductivity; provide examples of each type.	Giant Covalent Compounds Ionic Compounds Metallic Bonding Electronegativity
C.3.4 Draw structural formulas for and name simple molecules.	Compounds
C.3.5 Write chemical formulas for ionic compounds given their names and vice versa.	Naming Compounds
<b>Standard 4: Reactions and Stoichiometry</b>	
C.4.1 Predict products of simple reactions such as synthesis, decomposition, single replacement and double replacement.	Neutralization Thermal Decomposition Reacting Masses Redox Reactions
C.4.2 Balance chemical equations using the law of conservation of mass and use them to describe chemical reactions.	Conservation of Mass Reacting Masses
C.4.3 Use the mole concept to determine the number of moles and number of atoms or molecules in samples of elements and compounds, given mass of the sample.	What are Moles? Gases and Moles
C.4.4 Using a balanced chemical equation, calculate the quantities of reactants needed and products made in a chemical reaction that goes to completion.	Reacting Masses

C.4.5 Describe, classify and give examples of various kinds of reactions-synthesis (combination), decomposition, single displacement, double displacement and combustion.	Combustion Extracting Aluminum Neutralization Thermal Decomposition Reacting Masses Redox Reactions
C.4.6 Determine oxidation states and identify the substances apparently gaining and losing electrons in redox reactions.	Oxidation Numbers Redox Reactions
C.4.7 Perform calculations to determine percent composition by mass of a compound or mixture when given the formula.	Percentage Composition by Mass
<b>Standard 5: Behavior of Gases</b>	
C.5.1 Use kinetic molecular theory to explain changes in gas volumes, pressure, moles, and temperature.	–
C.5.2 Using the ideal gas equation of state, $PV = nRT$ , calculate the change in one variable when another variable is changed and the others are held constant.	Ideal Gas Laws
C.5.3 Given the equation for a chemical reaction involving one or more gases as reactants and/or products calculate the volumes of gas assuming the reaction goes to completion and the ideal gas law holds.	–
<b>Standard 6: Thermochemistry</b>	
C.6.1 Explain that atoms and molecules that make up matter are in constant motion and that this motion increases as thermal energy increases.	Particles in Action
C.6.2 Distinguish between the concepts of temperature and heat flow in macroscopic and microscopic terms.	–
C.6.3 Solve problems involving heat flow and temperature changes, using known values of specific heat and/or phase change constants (latent heat values).	–
C.6.4 Classify chemical reactions and phase changes as exothermic or endothermic.	Endothermic Reactions Exothermic Reactions
<b>Standard 7: Solutions</b>	
C.7.1 Describe the composition and properties of types of solutions.	Solutions
C.7.2 Explain how temperature, pressure and polarity of the solvent affect the solubility of a solute.	Solubility
C.7.3 Describe the concentration of solutes in solution in terms of molarity. Perform calculations using molarity, mass, and volume.	–
C.7.4 Prepare a specific volume of a solution of a given molarity when provided with a known solute.	–
C.7.5 Explain how the rate of a reaction is qualitatively affected by changes in concentration, temperature, surface area, and the use of a catalyst.	Concentration, Pressure and Reaction Rates Surface Area, Catalysts and Reactions Rates Temperature and Reaction Rates

C.7.6 Write equilibrium expressions for reversible reactions.	Reversible Reactions
<b>Standard 8: Acids and Bases</b>	
C.8.1 Use Arrhenius and Brønsted-Lowry definitions to classify substances as acids or bases.	–
C.8.2 Describe the characteristic properties of acids and bases.	Properties of Acids and Alkalis
C.8.3 Compare and contrast the dissociation and strength of acids and bases in solution.	Properties of Acids and Alkalis pH and Indicators
C.8.4 Given the hydronium (H <sub>3</sub> O <sup>+</sup> ) ion concentration in a solution, calculate the pH, and vice versa. Explain the meaning of these values.	–
C.8.5 From acid-base titration data, calculate the concentration of an unknown solution.	Neutralization
<b>Standard 9: Organic Chemistry and Biochemistry</b>	
C.9.1 Use structural formulas to illustrate carbon atoms' ability to bond covalently to one another to form many different substances.	Polymers Polysaccharides
C.9.2 Illustrate the variety of molecular types formed by the covalent bonding of carbon atoms and describe the typical properties of these molecular types.	Polymers Polysaccharides

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Integrated Chemistry and Physics, 2010 Standards	Boardworks High School Chemistry Presentation
<b>Standard 1: Motion and Energy of Macroscopic Objects</b>	
ICP.1.1 Measure the motion of objects to understand the relationships between distance, velocity, and acceleration and deepen understanding through graphical analysis of the time dependence of acceleration, velocity and distance.	<i>See Boardworks High School Physics for relevant presentations.</i>
ICP.1.2 Describe and apply Newton's three laws of motion. By experimentation, determine the relationships among the variables in Newton's laws and how all three laws relate mass, acceleration and force as a triad of proportional variables, leading to the definitions of momentum and energy.	
ICP.1.3 Describe how Newton's law of universal gravitation, together with the laws of motion, explains the motions of objects on earth and of the moon, planets and stars.	
ICP.1.4 Describe the kinetic and potential energies of macroscopic objects, and use measurements to develop an understanding of these forms of energy.	
<b>Standard 2: Mechanical Energy and Propagation of Energy by Waves</b>	
ICP.2.1 Identify properties of objects that vibrate, using Newton's laws to understand the motion. Understand that vibrating objects can give rise to mechanical waves.	<i>See Boardworks High School Physics for relevant presentations.</i>
ICP.2.2 Identify properties of waves including frequency, wavelength, amplitude, energy, and wave speed.	

ICP 2.3 Describe how energy is propagated by waves without the transfer of mass using examples such as water waves, earthquakes, and sound waves.	<i>See Boardworks High School Physics for relevant presentations.</i>
ICP.2.4 Apply the properties of waves to wave phenomena including reflection, and refraction, as well as the transmission and loss of energy.	
<b>Standard 3: Properties of Matter: Macroscopic as a Model for Microscopic</b>	
ICP.3.1 Describe how we use macroscopic properties of matter to model microscopic processes.	–
ICP.3.2 Study the characteristics of solids, liquids, and gases and their changes of state and interpret them in terms of a molecular model which describes their energies and motions.	Particles in Action Changing State
ICP 3.3 Understand how thermal energy (the microscopic motions of the atoms and/or molecules) is related to the macroscopic concept of temperature. Examine the differences in these concepts by measuring the temperature changes, and determining specific heat capacity, of water as it is heated or cooled.	–
ICP.3.4 Understand how the microscopic kinetic molecular theory, explains observations of macroscopic gas behavior in terms of temperature, volume, pressure, and the number of particles (using the mole concept).	Gases and Moles
<b>Standard 4: Energy Transport</b>	
ICP.4.1 Using conservation of energy, calculate the thermal energy released or absorbed by an object and distinguish between exothermic and endothermic changes.	Endothermic Reactions Exothermic Reactions
ICP.4.2 Differentiate between conduction, convection, and radiation and identify them as types of energy transfer.	<i>See Boardworks High School Physics for relevant presentations.</i>
ICP.4.3 Explain that electrons can absorb energy and can release energy, and that electrons in atoms do this at specific energies.	Observing Line Spectra
ICP.4.4 Describe the relationships between velocity, frequency, wavelength, and energy in electromagnetic waves. Describe the regions of the electromagnetic spectrum.	<i>See Boardworks High School Physics for relevant presentations.</i>
ICP 4.5 Understand that from diffraction we know that visible light is an electromagnetic wave.	<i>See Boardworks High School Physics for relevant presentations.</i>
<b>Standard 5: Chemical Energy, Reactions, and Bonding</b>	
ICP.5.1 Recognize and describe physical properties of matter and use these to differentiate between pure substances and mixtures.	–
ICP 5.2 Use the periodic table to understand important patterns in properties of elements. Recognize that the pattern of properties of the elements correlates most closely with the configuration of the electrons in each element.	Electron Structure and the Periodic Table Patterns of Behavior The Periodic Table
ICP.5.3 Understand that the atomic number is unique to each element and is the number of protons in the nucleus of the element.	Atomic Number and Mass Number

ICP.5.4 Use the concept of the mole to relate number of moles and the mass of a sample of a pure substance of known chemical composition.	What are Moles?
ICP.5.5 Using conservation principles write and balance chemical equations.	Conservation of Mass Reacting Masses
ICP.5.6 Identify key indicators of a chemical change and classify simple types of chemical reactions. Differentiate between covalent, ionic, hydrogen and Van der Waals bonding, and write formulas for and name compounds of each type.	Covalent Bonding Giant Covalent Structures Ionic Bonding Ionic Compounds Intermolecular Forces
ICP.5.7 Explain that in exothermic chemical reactions chemical energy is converted into other forms such as thermal, electrical, light, and sound energy.	Exothermic Reactions
<b>Standard 6: Electrical Energy Propagation and Magnetism</b>	
ICP.6.1 Explain that objects that carry a net charge will exert an electric force on other objects that may be attractive or repulsive.	<i>See Boardworks High School Physics for relevant presentations.</i>
ICP.6.2 Explain that when charge is transferred from one object to another, the amount lost by one object equals the amount gained by the other, consistent with the principal of conservation of charge.	
ICP.6.3 Using the example of electrolysis and its application in batteries, explain the relationship between chemical reactions and electrical energy.	
ICP.6.4 Define and describe the relationships between voltage, current, resistance and power in open and closed electrical circuits.	
ICP.6.5 Describe the differences in current flow in parallel and in series circuits.	
ICP.6.6 Explain that some objects, called magnets, exert magnetic forces with no direct contact.	
ICP.6.7 Using the examples of motors and generators, explain that electrical energy can be transformed into mechanical energy and vice versa.	
<b>Standard 7: Nuclear Energy (fission/fusion)</b>	
ICP.7.1 Demonstrate how historical models and experiments supported the development of our current understanding of the atom and its nucleus.	Introducing Atoms
ICP.7.2 Differentiate between protons, neutrons, and electrons and determine the number of these subatomic particles in each atom.	Atomic Structure
ICP.7.3 Understand that the stability of nuclei depends on the numbers of neutrons and protons.	–
ICP.7.4 Understand that fission results from large, less stable nuclei decomposing to form smaller, more stable nuclei.	Nuclear Fission
ICP.7.5 Understand that fusion results from two smaller nuclei combining to form one larger nucleus.	Nuclear Fusion
ICP 7.6 Understand that the energy radiated from the sun derives from the fusion process.	Nuclear Fusion
ICP.7.7 Describe the various forms of emission that are typical of radioactive decay.	Radioactivity Types of Radiation

ICP 7.8 Relate the fission process to the human development and use of the fission process in war (uncontrolled) and in peace (controlled).	Nuclear Fission
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Chemistry, 2006	Boardworks High School Chemistry Presentation
<b>Properties of Matter</b>	
C.1.1 Differentiate between pure substances and mixtures based on physical properties such as density, melting point, boiling point, and solubility.	Solutions Solubility
C.1.2 Determine the properties and quantities of matter such as mass, volume, temperature, density, melting point, boiling point, conductivity, solubility, color, numbers of moles, and pH (calculate pH from the hydrogen-ion concentration), and designate these properties as either extensive or intensive.	Alcohols Carboxylic Acids Giant Covalent Structures Hydrocarbons Ionic Compounds pH and Indicators Polymers Polysaccharides Properties of Acids and Alkalis Proteins Water The Noble Gases Molar Mass

C.1.3 Recognize indicators of chemical changes such as temperature change, the production of a gas, the production of a precipitate, or a color change.	Rates of Reaction Endothermic Reactions Exothermic Reactions Enthalpy Change Electrolysis of Dilute Sulfuric Acid Electrolysis of Lead Bromide Electrolysis of NaCl Combustion
C.1.4 Describe solutions in terms of their degree of saturation.	Solutions Solubility
C.1.5 Describe solutions in appropriate concentration units (be able to calculate these units), such as molarity, percent by mass or volume, parts per million (ppm), or parts per billion (ppb).	–
C.1.6 Predict formulas of stable ionic compounds based on charge balance of stable ions.	Ionic Compounds Ionic Bonding Formation of Ions Ionization Energy
C.1.7 Use appropriate nomenclature when naming compounds.	Naming Compounds
C.1.8 Use formulas and laboratory investigations to classify substances as metal or nonmetal, ionic or molecular, acid or base, and organic or inorganic.	Properties of Acids and Alkalis pH and Indicators Ionic Compounds
<b>The Nature of Chemical Change</b>	
C.1.9 Describe chemical reactions with balanced chemical equations.	Conservation of Mass Dynamic Equilibrium Reacting Masses
C.1.10 Recognize and classify reactions of various types such as oxidation-reduction.	Redox Reactions Thermal Decomposition Combustion Neutralization Fermentation Endothermic Reactions Exothermic Reactions
C.1.11 Predict products of simple reaction types including acid/base, electron transfer, and precipitation.	Neutralization Redox Reactions Formation of Ions Ionic Bonding Separating Mixtures

C.1.12 Demonstrate the principle of conservation of mass through laboratory investigations.	Conservation of Mass
C.1.13 Use the principle of conservation of mass to make calculations related to chemical reactions. Calculate the masses of reactants and products in a chemical reaction from the mass of one of the reactants or products and the relevant atomic masses.	Conservation of Mass Reacting Masses Atomic Number and Mass Number
C.1.14 Use Avogadro's law to make mass-volume calculations for simple chemical reactions.	Gases and Moles
C.1.15 Given a chemical equation, calculate the mass, gas volume, and/or number of moles needed to produce a given gas volume, mass, and/or number of moles of product.	Gases and Moles Reacting Masses
C.1.16 Calculate the percent composition by mass of a compound or mixture when given the formula.	Percentage Composition by Mass
C.1.17 Perform calculations that demonstrate an understanding of the relationship between molarity, volume, and number of moles of a solute in a solution.	Solutions Solubility Reacting Masses
C.1.18 Prepare a specified volume of a solution of given molarity.	–
C.1.19 Use titration data to calculate the concentration of an unknown solution.	Neutralization
C.1.20 Predict how a reaction rate will be quantitatively affected by changes of concentration.	Concentration, Pressure and Reaction Rates
C.1.21 Predict how changes in temperature, surface area, and the use of catalysts will qualitatively affect the rate of a reaction.	Surface Area, Catalysts and Reaction Rates Temperature and Reaction Rates
C.1.22 Use oxidation states to recognize electron transfer reactions and identify the substance(s) losing and gaining electrons in an electron transfer reaction.	Oxidation Numbers Redox Reactions
C.1.23 Write a rate law for a chemical reaction using experimental data.	–
C.1.24 Recognize and describe nuclear changes.	Nuclear Fission Nuclear Fusion
C.1.25 Recognize the importance of chemical processes in industrial and laboratory settings, e.g., electroplating, electrolysis, the operation of voltaic cells, and such important applications as the refining of aluminum.	Electrolysis of Dilute Sulfuric Acid Electrolysis of Lead Bromide Electrolysis of NaCl Extracting Aluminum
<b>The Structure of Matter</b>	

C.1.26 Describe physical changes and properties of matter through sketches and descriptions of the involved materials.	Alcohols Carboxylic Acids Giant Covalent Structures Hydrocarbons Ionic Compounds Polymers Polysaccharides Proteins Water
C.1.27 Describe chemical changes and reactions using sketches and descriptions of the reactants and products.	Endothermic Reactions Exothermic Reactions Electrolysis of Dilute Sulfuric Acid Electrolysis of Lead Bromide Electrolysis of NaCl Combustion Redox Reactions Thermal Decomposition Neutralization Fermentation
C.1.28 Explain that chemical bonds between atoms in molecules, and many large biological molecules are covalent.	Bonds and Activation Energy Comparing Bonding Covalent Bonding Ionic Bonding Metallic Bonding
C.1.29 Describe dynamic equilibrium.	Dynamic Equilibrium
C.1.30 Perform calculations that demonstrate an understanding of the gas laws. Apply the gas laws to relations between pressure, temperature, and volume of any amount of an ideal gas or any mixture of ideal gases.	Ideal Gas Laws Gases and Moles
C.1.31 Use kinetic molecular theory to explain changes in gas volumes, pressure, and temperature (Solve problems using $pV=nRT$ ).	Ideal Gas Laws
C.1.32 Describe the possible subatomic particles within an atom or ion.	Atomic Structure Introducing Atoms

C.1.33 Use an element's location in the Periodic Table to determine its number of valence electrons, and predict what stable ion or ions an element is likely to form in reacting with other specified elements.	Electron Structure and the Periodic Table Electron Configuration Formation of Ions Ionization Energy Electronegativity
C.1.34 Use the Periodic Table to compare attractions that atoms have for their electrons and explain periodic properties, such as atomic size, based on these attractions.	Electron Structure and the Periodic Table Electron Configuration Atomic Structure
C.1.35 Infer and explain physical properties of substances, such as melting points, boiling points, and solubility, based on the strength of molecular attractions.	Intermolecular Forces Alcohols
C.1.36 Describe the nature of ionic, covalent, and hydrogen bonds and give examples of how they contribute to the formation of various types of compounds.	Ionic Bonding Covalent Bonding Intermolecular Forces
C.1.37 Describe that spectral lines are the result of transitions of electrons between energy levels and that these lines correspond to photons with a frequency related to the energy spacing between levels by using Planck's relationship ( $E=h\nu$ ).	Energy Sublevels Observing Line Spectra
<b>The Nature of Energy and Change</b>	
C.1.38 Distinguish between the concepts of temperature and heat.	Heat
C.1.39 Solve problems involving heat flow and temperature changes, using known values of specific heat and latent heat of phase change.	Enthalpy Change Changing State Endothermic Reactions Exothermic Reactions
C.1.40 Classify chemical reactions and/or phase changes as exothermic or endothermic.	Endothermic Reactions Exothermic Reactions
C.1.41 Describe the role of light, heat, and electrical energies in physical, chemical, and nuclear changes.	Heat Enthalpy Change Energy Transfer
C.1.42 Describe that the energy release per gram of material is much larger in nuclear fusion or fission reactions than in chemical reactions. The change in mass (calculated by $E=mc^2$ ) is small but significant in nuclear reactions.	Nuclear Fission Nuclear Fusion
C.1.43 Calculate the amount of radioactive substance remaining after an integral number of half-lives have passed.	Half-life
<b>The Basic Structures and Reactions of Organic Chemicals</b>	

C.1.44 Convert between formulas and names of common organic compounds.	Proteins Polysaccharides
C.1.45 Recognize common functional groups and polymers when given chemical formulas and names.	Functional Groups Polymers Polysaccharides Proteins

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Chemistry, 2006	Boardworks High School Chemistry Presentation
<b>Properties of Matter</b>	
CP.1.1 Understand and explain that atoms have a positive nucleus (consisting of relatively massive positive protons and neutral neutrons) surrounded by negative electrons of much smaller mass, some of which may be lost, gained, or shared when interacting with other atoms.	Atomic Structure Comparing Bonding Covalent Bonding Electron Configuration Electron Structure and the Periodic Table Ionic Bonding Why do Atoms form Bonds?
CP.1.2 Realize that and explain how a neutral atom's atomic number and mass number can be used to determine the number of protons, neutrons, and electrons that make up an atom.	Atomic Number and Mass Number
CP.1.3 Understand, and give examples to show, that isotopes of the same element have the same numbers of protons and electrons but differ in the numbers of neutrons.	Isotopes
CP.1.4 Know and explain that physical properties can be used to differentiate among pure substances, solutions, and heterogeneous mixtures.	-
<b>Changes in Matter</b>	
CP.1.5 Distinguish among chemical and physical changes in matter by identifying characteristics of these changes.	Changing State
CP.1.6 Understand and explain how an atom can acquire an unbalanced electrical charge by gaining or losing electrons.	Formation of Ions
CP.1.7 Identify the substances gaining and losing electrons in simple oxidation-reduction reactions.	Redox Reactions Oxidation Numbers

CP.1.8 Know and explain that the nucleus of a radioactive isotope is unstable and may spontaneously decay, emitting particles and/or electromagnetic radiation.	Radioactivity
CP.1.9 Show how the predictability of the nuclei decay rate allows radioactivity to be used for estimating the age of materials that contain radioactive substances.	Half-life Radioactive Dating
CP.1.10 Understand that the Periodic Table is a listing of elements arranged by increasing atomic number, and use it to predict whether a selected atom would gain, lose, or share electrons as it interacts with other selected atoms.	Electron Structure and The Periodic Table Patterns of Behavior The Periodic Table
CP.1.11 Understand and give examples to show that an enormous variety of biological, chemical, and physical phenomena can be explained by changes in the arrangement and motion of atoms and molecules.	Giant Covalent Structures Ionic Compounds Particles in Action
CP.1.12 Realize and explain that because mass is conserved in chemical reactions, balanced chemical equations must be used to show that atoms are conserved.	Conservation of Mass Reacting Masses
CP.1.13 Explain that the rate of reactions among atoms and molecules depends on how often they encounter one another, which is in turn affected by the concentrations, pressures, and temperatures of the reacting materials.	Concentration, Pressure and Reaction Rates Rates of Reaction Surface Area, Catalysts and Reaction Rates Temperature and Reaction Rates
CP.1.14 Understand and explain that catalysts are highly effective in encouraging the interaction of other atoms and molecules.	Surface Area, Catalysts and Reaction Rates
<b>Energy Transformations</b>	
CP.1.15 Understand and explain that whenever the amount of energy in one place or form diminishes, the amount in other places or forms increases by the same amount.	–
CP.1.16 Explain that heat energy in a material consists of the disordered motions of its atoms or molecules.	–
CP.1.17 Know and explain that transformations of energy usually transform some energy into the form of heat, which dissipates by radiation or conduction into cooler surroundings.	Energy Transfers
CP.1.18 Recognize and describe the heat transfer associated with a chemical reaction or a phase change as either exothermic or endothermic, and understand the significance of the distinction.	Bonds and Activation Energy Endothermic Reactions Exothermic Reactions
CP.1.19 Understand and explain that the energy released whenever heavy nuclei split or light nuclei combine is roughly a million times greater than the energy absorbed or released in a chemical reaction. ( $E=mc^2$ )	Nuclear Fission

CP.1.20 Realize and explain that the energy in a system\* is the sum of both potential energy and kinetic energy. \*  
Systems could take different forms. One example would be that of an airplane travelling at Mach 3.

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