Inquiry Investigations™
Cellular World MODULE – 1271974
Grades: 7-10

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California Content Standards
Science
Grade 7

CONTENT STANDARD	**CA.1.**	**Life Science: Cell Biology: All living organisms are composed of cells, from just one to many trillions, whose details usually are visible only through a microscope. As a basis for understanding this concept:**
PERFORMANCE STANDARD	**1.a.**	Students know cells function similarly in all living organisms. • Cell Growth: Teacher Resoruce CD • Cell Process: Teacher Resource CD • Cell Reproduction and the Cell Cycle: Teacher Resource CD • Cell Structure and Function: Teacher Resource CD • Cell Types and Organization: Teacher Resource CD • Cells and Energy: Teacher Resource CD • Cellular World Unit 1 Lab 1 Activity 1 Learning About Cell Types • Cellular World Unit 1 Lab 1 Activity 2 Learning About Cell Organization • Cellular World Unit 2 Lab 2 Activity 1 Comparison of Plant and Animal Cell Organelles • Cellular World Unit 2 Lab 2 Activity 2 Identification of DNA and RNA in Plant Cells • Cellular World Unit 2 Lab 2 Activity 3 Identification of Mitochondria • Cellular World Unit 2 Lab 2 Activity 4 Plant Cell Structure and Function • Cellular World Unit 3 Lab 3 Activity 1 Osmoregulation in Cells • Cellular World Unit 3 Lab 3 Activity 2 Osmosis and Diffusion in Model Cells • Cellular World Unit 4 Lab 4 Activity 1 Investigating Carbon Cycling • Cellular World Unit 4 Lab 4 Activity 2 A Closer Look at Catalase • Cellular World Unit 4 Lab 4 Activity 3 Investigating Plant Pigments • Cellular World Unit 5 Lab 5 Activity 1 Growth and Preparation of Onion Roots • Cellular World Unit 5 Lab 5 Activity 2 Observing the Cell Cycle in Onion Roots • Cellular World Unit 5 Lab 5 Activity 3 Modeling Mitosis • Cellular World Unit 5 Lab 5 Activity 4 Modeling Meiosis and Fertilization • Cellular World Unit 6 Lab 6 Activity 1 Understanding Why Cells Aren't Big • Cellular World Unit 6 Lab 6 Activity 2 Investigating Cell Growth Curves • Cellular World Unit 7 Lab 7 Activity 1 Developing a Biochemical Test for Catalase • Why Cells Aren't Big: Virtual Lab
PERFORMANCE STANDARD	**1.b.**	Students know the characteristics that distinguish plant cells from animal cells, including chloroplasts and cell walls.

		• Cell Process: Teacher Resource CD • Cell Structure and Function: Teacher Resource CD • Cell Types and Organization: Teacher Resource CD • Cellular World Unit 1 Lab 1 Activity 1 Learning About Cell Types • Cellular World Unit 1 Lab 1 Activity 2 Learning About Cell Organization • Cellular World Unit 2 Lab 2 Activity 1 Comparison of Plant and Animal Cell Organelles • Cellular World Unit 2 Lab 2 Activity 2 Identification of DNA and RNA in Plant Cells • Cellular World Unit 2 Lab 2 Activity 3 Identification of Mitochondria • Cellular World Unit 2 Lab 2 Activity 4 Plant Cell Structure and Function • Cellular World Unit 4 Lab 4 Activity 1 Investigating Carbon Cycling • Cellular World Unit 4 Lab 4 Activity 3 Investigating Plant Pigments • Cellular World Unit 5 Lab 5 Activity 1 Growth and Preparation of Onion Roots • Cellular World Unit 5 Lab 5 Activity 2 Observing the Cell Cycle in Onion Roots • Cellular World Unit 5 Lab 5 Activity 3 Modeling Mitosis • Cellular World Unit 5 Lab 5 Activity 4 Modeling Meiosis and Fertilization • Cellular World Unit 6 Lab 6 Activity 1 Understanding Why Cells Aren't Big • Cellular World Unit 7 Lab 7 Activity 1 Developing a Biochemical Test for Catalase
PERFORMANCE STANDARD	**1.c.**	Students know the nucleus is the repository for genetic information in plant and animal cells. • Cell Structure and Function: Teacher Resource CD • Cell Types and Organization: Teacher Resource CD • Cellular World Unit 1 Lab 1 Activity 1 Learning About Cell Types • Cellular World Unit 1 Lab 1 Activity 2 Learning About Cell Organization • Cellular World Unit 2 Lab 2 Activity 1 Comparison of Plant and Animal Cell Organelles • Cellular World Unit 2 Lab 2 Activity 2 Identification of DNA and RNA in Plant Cells • Cellular World Unit 2 Lab 2 Activity 3 Identification of Mitochondria
PERFORMANCE STANDARD	**1.d.**	Students know that mitochondria liberate energy for the work that cells do and that chloroplasts capture sunlight energy for photosynthesis. • Cells and Energy: Teacher Resource CD • Cellular World Unit 4 Lab 4 Activity 1 Investigating Carbon Cycling • Cellular World Unit 4 Lab 4 Activity 3 Investigating Plant Pigments
PERFORMANCE STANDARD	**1.e.**	Students know cells divide to increase their numbers through a process of mitosis, which results in two daughter cells with identical sets of chromosomes. • Cell Growth: Teacher Resoruce CD • Cell Reproduction and the Cell Cycle: Teacher Resource CD • Cell Types and Organization: Teacher Resource CD • Cellular World Unit 5 Lab 5 Activity 2 Observing the Cell Cycle in Onion Roots • Cellular World Unit 5 Lab 5 Activity 3 Modeling Mitosis

		• Cellular World Unit 5 Lab 5 Activity 4 Modeling Meiosis and Fertilization
PERFORMANCE STANDARD	**1.f.**	Students know that as multicellular organisms develop, their cells differentiate. • Cell Types and Organization: Teacher Resource CD • Cellular World Unit 1 Lab 1 Activity 1 Learning About Cell Types • Cellular World Unit 1 Lab 1 Activity 2 Learning About Cell Organization • Cellular World Unit 2 Lab 2 Activity 2 Identification of DNA and RNA in Plant Cells • Cellular World Unit 6 Lab 6 Activity 1 Understanding Why Cells Aren't Big
CONTENT STANDARD	**CA.2.**	**Life Science: Genetics: A typical cell of any organism contains genetic instructions that specify its traits. Those traits may be modified by environmental influences. As a basis for under-standing this concept:**
PERFORMANCE STANDARD	**2.a.**	Students know the differences between the life cycles and reproduction methods of sexual and asexual organisms. • Cell Growth: Teacher Resoruce CD • Cell Reproduction and the Cell Cycle: Teacher Resource CD • Cell Types and Organization: Teacher Resource CD • Cellular World Unit 5 Lab 5 Activity 4 Modeling Meiosis and Fertilization • Cellular World Unit 6 Lab 6 Activity 2 Investigating Cell Growth Curves
PERFORMANCE STANDARD	**2.b.**	Students know sexual reproduction produces offspring that inherit half their genes from each parent. • Cell Growth: Teacher Resoruce CD • Cell Reproduction and the Cell Cycle: Teacher Resource CD • Cell Types and Organization: Teacher Resource CD • Cellular World Unit 5 Lab 5 Activity 4 Modeling Meiosis and Fertilization • Cellular World Unit 6 Lab 6 Activity 2 Investigating Cell Growth Curves
PERFORMANCE STANDARD	**2.e.**	Students know DNA (deoxyribonucleic acid) is the genetic material of living organisms and is located in the chromosomes of each cell. • Cell Reproduction and the Cell Cycle: Teacher Resource CD • Cell Structure and Function: Teacher Resource CD • Cell Types and Organization: Teacher Resource CD • Cellular World Unit 1 Lab 1 Activity 2 Learning About Cell Organization • Cellular World Unit 2 Lab 2 Activity 2 Identification of DNA and RNA in Plant Cells • Cellular World Unit 5 Lab 5 Activity 2 Observing the Cell Cycle in Onion Roots • Cellular World Unit 5 Lab 5 Activity 3 Modeling Mitosis • Cellular World Unit 5 Lab 5 Activity 4 Modeling Meiosis and Fertilization
CONTENT STANDARD	**CA.5.**	**Life Science: Structure and Function in Living Systems: The anatomy and physiology of plants and animals illustrate the complementary nature of structure and function. As a basis for understanding this concept:**

PERFORMANCE STANDARD	**5.a.**	Students know plants and animals have levels of organization for structure and function, including cells, tissues, organs, organ systems, and the whole organism. • Cell Types and Organization: Teacher Resource CD • Cellular World Unit 1 Lab 1 Activity 1 Learning About Cell Types • Cellular World Unit 1 Lab 1 Activity 2 Learning About Cell Organization • Cellular World Unit 6 Lab 6 Activity 1 Understanding Why Cells Aren't Big
CONTENT STANDARD	**CA.6.**	**Life Science: Physical Principles in Living Systems (Physical Science): Physical principles underlie biological structures and functions. As a basis for understanding this concept:**
PERFORMANCE STANDARD	**6.j.**	Students know that contractions of the heart generate blood pressure and that heart valves prevent backflow of blood in the circulatory system. • Cell Types and Organization: Teacher Resource CD
CONTENT STANDARD	**CA.7.**	**Life Science: Investigation and Experimentation: Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:**
PERFORMANCE STANDARD	**7.a.**	Select and use appropriate tools and technology (including calculators, computers, balances, spring scales, microscopes, and binoculars) to perform tests, collect data, and display data. • Cell Types and Organization: Teacher Resource CD • Cellular World Unit 1 Lab 1 Activity 1 Learning About Cell Types • Cellular World Unit 1 Lab 1 Activity 2 Learning About Cell Organization • Cellular World Unit 2 Lab 2 Activity 1 Comparison of Plant and Animal Cell Organelles • Cellular World Unit 2 Lab 2 Activity 2 Identification of DNA and RNA in Plant Cells • Cellular World Unit 2 Lab 2 Activity 3 Identification of Mitochondria • Cellular World Unit 2 Lab 2 Activity 4 Plant Cell Structure and Function • Cellular World Unit 3 Lab 3 Activity 1 Osmoregulation in Cells • Cellular World Unit 3 Lab 3 Activity 2 Osmosis and Diffusion in Model Cells • Cellular World Unit 4 Lab 4 Activity 1 Investigating Carbon Cycling • Cellular World Unit 4 Lab 4 Activity 2 A Closer Look at Catalase • Cellular World Unit 4 Lab 4 Activity 3 Investigating Plant Pigments • Cellular World Unit 5 Lab 5 Activity 1 Growth and Preparation of Onion Roots • Cellular World Unit 5 Lab 5 Activity 2 Observing the Cell Cycle in Onion Roots • Cellular World Unit 5 Lab 5 Activity 3 Modeling Mitosis • Cellular World Unit 5 Lab 5 Activity 4 Modeling Meiosis and Fertilization • Cellular World Unit 6 Lab 6 Activity 1 Understanding Why Cells Aren't Big • Cellular World Unit 6 Lab 6 Activity 2 Investigating Cell Growth Curves • Cellular World Unit 7 Lab 7 Activity 1 Developing a Biochemical Test for Catalase • Why Cells Aren't Big: Virtual Lab

PERFORMANCE STANDARD	**7.c.**	Communicate the logical connection among hypotheses, science concepts, tests conducted, data collected, and conclusions drawn from the scientific evidence. • Cellular World Unit 1 Lab 1 Activity 1 Learning About Cell Types • Cellular World Unit 1 Lab 1 Activity 2 Learning About Cell Organization • Cellular World Unit 2 Lab 2 Activity 1 Comparison of Plant and Animal Cell Organelles • Cellular World Unit 2 Lab 2 Activity 2 Identification of DNA and RNA in Plant Cells • Cellular World Unit 2 Lab 2 Activity 3 Identification of Mitochondria • Cellular World Unit 2 Lab 2 Activity 4 Plant Cell Structure and Function • Cellular World Unit 3 Lab 3 Activity 1 Osmoregulation in Cells • Cellular World Unit 3 Lab 3 Activity 2 Osmosis and Diffusion in Model Cells • Cellular World Unit 4 Lab 4 Activity 1 Investigating Carbon Cycling • Cellular World Unit 4 Lab 4 Activity 2 A Closer Look at Catalase • Cellular World Unit 4 Lab 4 Activity 3 Investigating Plant Pigments • Cellular World Unit 5 Lab 5 Activity 1 Growth and Preparation of Onion Roots • Cellular World Unit 5 Lab 5 Activity 2 Observing the Cell Cycle in Onion Roots • Cellular World Unit 5 Lab 5 Activity 3 Modeling Mitosis • Cellular World Unit 5 Lab 5 Activity 4 Modeling Meiosis and Fertilization • Cellular World Unit 6 Lab 6 Activity 1 Understanding Why Cells Aren't Big • Cellular World Unit 6 Lab 6 Activity 2 Investigating Cell Growth Curves • Cellular World Unit 7 Lab 7 Activity 1 Developing a Biochemical Test for Catalase • Why Cells Aren't Big: Virtual Lab
PERFORMANCE STANDARD	**7.d.**	Construct scale models, maps, and appropriately labeled diagrams to communicate scientific knowledge (e.g., motion of Earth's plates and cell structure). • Cellular World Unit 3 Lab 3 Activity 1 Osmoregulation in Cells • Cellular World Unit 3 Lab 3 Activity 2 Osmosis and Diffusion in Model Cells • Cellular World Unit 5 Lab 5 Activity 2 Observing the Cell Cycle in Onion Roots • Cellular World Unit 5 Lab 5 Activity 3 Modeling Mitosis • Cellular World Unit 5 Lab 5 Activity 4 Modeling Meiosis and Fertilization • Cellular World Unit 6 Lab 6 Activity 1 Understanding Why Cells Aren't Big
PERFORMANCE STANDARD	**7.e.**	Communicate the steps and results from an investigation in written reports and oral presentations. • Cellular World Unit 1 Lab 1 Activity 1 Learning About Cell Types • Cellular World Unit 1 Lab 1 Activity 2 Learning About Cell Organization • Cellular World Unit 2 Lab 2 Activity 1 Comparison of Plant and Animal Cell Organelles • Cellular World Unit 2 Lab 2 Activity 2 Identification of DNA and RNA in Plant Cells • Cellular World Unit 2 Lab 2 Activity 3 Identification of Mitochondria

		• Cellular World Unit 2 Lab 2 Activity 4 Plant Cell Structure and Function • Cellular World Unit 3 Lab 3 Activity 1 Osmoregulation in Cells • Cellular World Unit 3 Lab 3 Activity 2 Osmosis and Diffusion in Model Cells • Cellular World Unit 4 Lab 4 Activity 1 Investigating Carbon Cycling • Cellular World Unit 4 Lab 4 Activity 2 A Closer Look at Catalase • Cellular World Unit 4 Lab 4 Activity 3 Investigating Plant Pigments • Cellular World Unit 5 Lab 5 Activity 1 Growth and Preparation of Onion Roots • Cellular World Unit 5 Lab 5 Activity 2 Observing the Cell Cycle in Onion Roots • Cellular World Unit 5 Lab 5 Activity 3 Modeling Mitosis • Cellular World Unit 5 Lab 5 Activity 4 Modeling Meiosis and Fertilization • Cellular World Unit 6 Lab 6 Activity 1 Understanding Why Cells Aren't Big • Cellular World Unit 6 Lab 6 Activity 2 Investigating Cell Growth Curves • Cellular World Unit 7 Lab 7 Activity 1 Developing a Biochemical Test for Catalase • Why Cells Aren't Big: Virtual Lab

Grade 8

CONTENT STANDARD	**CA.5.**	**Physical Science: Reactions: Chemical reactions are processes in which atoms are rearranged into different combinations of molecules. As a basis for understanding this concept:**
PERFORMANCE STANDARD	**5.a.**	Students know reactant atoms and molecules interact to form products with different chemical properties. • Cells and Energy: Teacher Resource CD • Cellular World Unit 4 Lab 4 Activity 1 Investigating Carbon Cycling • Cellular World Unit 4 Lab 4 Activity 2 A Closer Look at Catalase • Cellular World Unit 7 Lab 7 Activity 1 Developing a Biochemical Test for Catalase
CONTENT STANDARD	**CA.7.**	**Physical Science: Periodic Table: The organization of the periodic table is based on the properties of the elements and reflects the structure of atoms. As a basis for understanding this concept:**
PERFORMANCE STANDARD	**7.c.**	Students know substances can be classified by their properties, including their melting temperature, density, hardness, and thermal and electrical conductivity. • Cellular World Unit 6 Lab 6 Activity 2 Investigating Cell Growth Curves
CONTENT STANDARD	**CA.8.**	**Physical Science: Density and Buoyancy: All objects experience a buoyant force when immersed in a fluid. As a basis for understanding this concept:**
PERFORMANCE STANDARD	**8.a.**	Students know density is mass per unit volume. • Cellular World Unit 6 Lab 6 Activity 2 Investigating Cell Growth Curves
PERFORMANCE STANDARD	**8.b.**	Students know how to calculate the density of substances (regular and irregular solids and liquids) from measurements of mass and volume. • Cellular World Unit 6 Lab 6 Activity 2 Investigating Cell Growth Curves
CONTENT	**CA.9.**	**Physical Science: Investigation and Experimentation: Scientific progress is made**

STANDARD		**by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:**
PERFORMANCE STANDARD	**9.f.**	Apply simple mathematic relationships to determine a missing quantity in a mathematic expression, given the two remaining terms (including speed = distance/time, density = mass/volume, force = pressure x area, volume = area x height). • Cellular World Unit 6 Lab 6 Activity 1 Understanding Why Cells Aren't Big • Cellular World Unit 6 Lab 6 Activity 2 Investigating Cell Growth Curves • Cellular World Unit 7 Lab 7 Activity 1 Developing a Biochemical Test for Catalase

Grade 9

CONTENT STANDARD	**CA.3.**	**Chemistry: Conservation of Matter and Stoichiometry: The conservation of atoms in chemical reactions leads to the principle of conservation of matter and the ability to calculate the mass of products and reactants. As a basis for understanding this concept:**
PERFORMANCE STANDARD	**3.a.**	Students know how to describe chemical reactions by writing balanced equations. • Cellular World Unit 4 Lab 4 Activity 2 A Closer Look at Catalase
CONTENT STANDARD	**CA.6.**	**Chemistry: Solutions: Solutions are homogenous mixtures of two or more substances. As a basis for understanding this concept:**
PERFORMANCE STANDARD	**6.b.**	Students know how to describe the dissolving process at the molecular level by using the concept of random molecular motion. • Cellular World Unit 4 Lab 4 Activity 3 Investigating Plant Pigments
PERFORMANCE STANDARD	**6.c.**	Students know temperature, pressure, and surface area affect the dissolving process. • Cellular World Unit 4 Lab 4 Activity 3 Investigating Plant Pigments
PERFORMANCE STANDARD	**6.f.**	Students know how molecules in a solution are separated or purified by the methods of chromatography and distillation. • Cells and Energy: Teacher Resource CD
CONTENT STANDARD	**CA.8.**	**Chemistry: Reaction Rates: Chemical reaction rates depend on factors that influence the frequency of collision of reactant molecules. As a basis for understanding this concept:**
PERFORMANCE STANDARD	**8.a.**	Students know the rate of reaction is the decrease in concentration of reactants or the increase in concentration of products with time. • Cells and Energy: Teacher Resource CD • Cellular World Unit 4 Lab 4 Activity 2 A Closer Look at Catalase • Cellular World Unit 7 Lab 7 Activity 1 Developing a Biochemical Test for Catalase
PERFORMANCE STANDARD	**8.b.**	Students know how reaction rates depend on such factors as concentration, temperature, and pressure.

		• Cells and Energy: Teacher Resource CD • Cellular World Unit 4 Lab 4 Activity 2 A Closer Look at Catalase • Cellular World Unit 7 Lab 7 Activity 1 Developing a Biochemical Test for Catalase
PERFORMANCE STANDARD	**8.c.**	Students know the role a catalyst plays in increasing the reaction rate. • Cellular World Unit 4 Lab 4 Activity 2 A Closer Look at Catalase • Cellular World Unit 7 Lab 7 Activity 1 Developing a Biochemical Test for Catalase
CONTENT STANDARD	**CA.1.**	**Biology/Life Sciences: Cell Biology: The fundamental life processes of plants and animals depend on a variety of chemical reactions that occur in specialized areas of the organism's cells. As a basis for understanding this concept:**
PERFORMANCE STANDARD	**1.a.**	Students know cells are enclosed within semipermeable membranes that regulate their interaction with their surroundings. • Cell Structure and Function: Teacher Resource CD • Cell Types and Organization: Teacher Resource CD • Cellular World Unit 1 Lab 1 Activity 1 Learning About Cell Types • Cellular World Unit 1 Lab 1 Activity 2 Learning About Cell Organization • Cellular World Unit 2 Lab 2 Activity 1 Comparison of Plant and Animal Cell Organelles • Cellular World Unit 2 Lab 2 Activity 3 Identification of Mitochondria • Cellular World Unit 3 Lab 3 Activity 1 Osmoregulation in Cells
PERFORMANCE STANDARD	**1.b.**	Students know enzymes are proteins that catalyze biochemical reactions without altering the reaction equilibrium and the activities of enzymes depend on the temperature, ionic conditions, and the pH of the surroundings. • Cell Structure and Function: Teacher Resource CD • Cells and Energy: Teacher Resource CD • Cellular World Unit 4 Lab 4 Activity 2 A Closer Look at Catalase • Cellular World Unit 7 Lab 7 Activity 1 Developing a Biochemical Test for Catalase
PERFORMANCE STANDARD	**1.c.**	Students know how prokaryotic cells, eukaryotic cells (including those from plants and animals), and viruses differ in complexity and general structure. • Cell Structure and Function: Teacher Resource CD • Cell Types and Organization: Teacher Resource CD • Cellular World Unit 1 Lab 1 Activity 1 Learning About Cell Types • Cellular World Unit 1 Lab 1 Activity 2 Learning About Cell Organization • Cellular World Unit 7 Lab 7 Activity 1 Developing a Biochemical Test for Catalase
PERFORMANCE STANDARD	**1.d.**	Students know the central dogma of molecular biology outlines the flow of information from transcription of ribonucleic acid (RNA) in the nucleus to translation of proteins on ribosomes in the cytoplasm. • Cellular World Unit 5 Lab 5 Activity 3 Modeling Mitosis • Cellular World Unit 5 Lab 5 Activity 4 Modeling Meiosis and

		Fertilization
PERFORMANCE STANDARD	**1.e.**	Students know the role of the endoplasmic reticulum and Golgi apparatus in the secretion of proteins. • Cell Process: Teacher Resource CD • Cell Reproduction and the Cell Cycle: Teacher Resource CD • Cell Structure and Function: Teacher Resource CD • Cell Types and Organization: Teacher Resource CD • Cells and Energy: Teacher Resource CD • Cellular World Unit 1 Lab 1 Activity 1 Learning About Cell Types • Cellular World Unit 1 Lab 1 Activity 2 Learning About Cell Organization • Cellular World Unit 2 Lab 2 Activity 1 Comparison of Plant and Animal Cell Organelles • Cellular World Unit 2 Lab 2 Activity 2 Identification of DNA and RNA in Plant Cells • Cellular World Unit 2 Lab 2 Activity 3 Identification of Mitochondria • Cellular World Unit 2 Lab 2 Activity 4 Plant Cell Structure and Function
PERFORMANCE STANDARD	**1.f.**	Students know usable energy is captured from sunlight by chloroplasts and is stored through the synthesis of sugar from carbon dioxide. • Cell Structure and Function: Teacher Resource CD • Cell Types and Organization: Teacher Resource CD • Cells and Energy: Teacher Resource CD • Cellular World Unit 1 Lab 1 Activity 1 Learning About Cell Types • Cellular World Unit 1 Lab 1 Activity 2 Learning About Cell Organization • Cellular World Unit 2 Lab 2 Activity 1 Comparison of Plant and Animal Cell Organelles • Cellular World Unit 2 Lab 2 Activity 3 Identification of Mitochondria • Cellular World Unit 2 Lab 2 Activity 4 Plant Cell Structure and Function • Cellular World Unit 4 Lab 4 Activity 1 Investigating Carbon Cycling • Cellular World Unit 4 Lab 4 Activity 3 Investigating Plant Pigments
PERFORMANCE STANDARD	**1.g.**	Students know the role of the mitochondria in making stored chemical-bond energy available to cells by completing the breakdown of glucose to carbon dioxide. • Cell Process: Teacher Resource CD • Cell Reproduction and the Cell Cycle: Teacher Resource CD • Cell Structure and Function: Teacher Resource CD • Cell Types and Organization: Teacher Resource CD • Cells and Energy: Teacher Resource CD • Cellular World Unit 1 Lab 1 Activity 1 Learning About Cell Types • Cellular World Unit 1 Lab 1 Activity 2 Learning About Cell Organization • Cellular World Unit 2 Lab 2 Activity 1 Comparison of Plant and Animal Cell Organelles • Cellular World Unit 2 Lab 2 Activity 2 Identification of DNA and RNA in Plant Cells • Cellular World Unit 2 Lab 2 Activity 3 Identification of Mitochondria • Cellular World Unit 2 Lab 2 Activity 4 Plant Cell Structure and Function • Cellular World Unit 4 Lab 4 Activity 1 Investigating Carbon Cycling • Cellular World Unit 4 Lab 4 Activity 2 A Closer Look at Catalase

PERFORMANCE STANDARD	**1.j**	Students know how eukaryotic cells are given shape and internal organization by a cytoskeleton or cell wall or both. • Cell Structure and Function: Teacher Resource CD • Cell Types and Organization: Teacher Resource CD • Cellular World Unit 1 Lab 1 Activity 1 Learning About Cell Types • Cellular World Unit 1 Lab 1 Activity 2 Learning About Cell Organization • Cellular World Unit 7 Lab 7 Activity 1 Developing a Biochemical Test for Catalase
CONTENT STANDARD	**CA.2.**	**Biology/Life Sciences: Genetics: Mutation and sexual reproduction lead to genetic variation in a population. As a basis for understanding this concept:**
PERFORMANCE STANDARD	**2.a.**	Students know meiosis is an early step in sexual reproduction in which the pairs of chromosomes separate and segregate randomly during cell division to produce gametes containing one chromosome of each type. • Cell Reproduction and the Cell Cycle: Teacher Resource CD • Cellular World Unit 5 Lab 5 Activity 4 Modeling Meiosis and Fertilization
PERFORMANCE STANDARD	**2.b.**	Students know only certain cells in a multicellular organism undergo meiosis. • Cell Reproduction and the Cell Cycle: Teacher Resource CD • Cellular World Unit 5 Lab 5 Activity 4 Modeling Meiosis and Fertilization
PERFORMANCE STANDARD	**2.c.**	Students know how random chromosome segregation explains the probability that a particular allele will be in a gamete. • Cell Reproduction and the Cell Cycle: Teacher Resource CD • Cellular World Unit 5 Lab 5 Activity 4 Modeling Meiosis and Fertilization
PERFORMANCE STANDARD	**2.d.**	Students know new combinations of alleles may be generated in a zygote through the fusion of male and female gametes (fertilization). • Cellular World Unit 5 Lab 5 Activity 4 Modeling Meiosis and Fertilization
PERFORMANCE STANDARD	**2.e.**	Students know why approximately half of an individual's DNA sequence comes from each parent. • Cell Growth: Teacher Resoruce CD • Cell Reproduction and the Cell Cycle: Teacher Resource CD • Cell Types and Organization: Teacher Resource CD • Cellular World Unit 5 Lab 5 Activity 4 Modeling Meiosis and Fertilization • Cellular World Unit 6 Lab 6 Activity 2 Investigating Cell Growth Curves
PERFORMANCE STANDARD	**2.f.**	Students know the role of chromosomes in determining an individual's sex. • Cellular World Unit 5 Lab 5 Activity 4 Modeling Meiosis and

		Fertilization
CONTENT STANDARD	**CA.4.**	**Biology/Life Sciences: Genetics: Genes are a set of instructions encoded in the DNA sequence of each organism that specify the sequence of amino acids in proteins characteristic of that organism. As a basis for understanding this concept:**
PERFORMANCE STANDARD	**4.d.**	Students know specialization of cells in multicellular organisms is usually due to different patterns of gene expression rather than to differences of the genes themselves. • Cell Types and Organization: Teacher Resource CD • Cellular World Unit 1 Lab 1 Activity 2 Learning About Cell Organization • Cellular World Unit 2 Lab 2 Activity 2 Identification of DNA and RNA in Plant Cells
CONTENT STANDARD	**CA.5.**	**Biology/Life Sciences: Genetics: The genetic composition of cells can be altered by incorporation of exogenous DNA into the cells. As a basis for understanding this concept:**
PERFORMANCE STANDARD	**5.a.**	Students know the general structures and functions of DNA, RNA, and protein. • Cellular World Unit 2 Lab 2 Activity 2 Identification of DNA and RNA in Plant Cells
PERFORMANCE STANDARD	**5.b.**	Students know how to apply base-pairing rules to explain precise copying of DNA during semiconservative replication and transcription of information from DNA into mRNA. • Cellular World Unit 5 Lab 5 Activity 3 Modeling Mitosis • Cellular World Unit 5 Lab 5 Activity 4 Modeling Meiosis and Fertilization
CONTENT STANDARD	**CA.6.**	**Biology/Life Sciences: Ecology: Stability in an ecosystem is a balance between competing effects. As a basis for understanding this concept:**
PERFORMANCE STANDARD	**6.b.**	Students know how to analyze changes in an ecosystem resulting from changes in climate, human activity, introduction of nonnative species, or changes in population size. • Cellular World Unit 6 Lab 6 Activity 2 Investigating Cell Growth Curves
PERFORMANCE STANDARD	**6.c.**	Students know how fluctuations in population size in an ecosystem are deter-mined by the relative rates of birth, immigration, emigration, and death. • Cellular World Unit 6 Lab 6 Activity 2 Investigating Cell Growth Curves
PERFORMANCE STANDARD	**6.g.**	Students know how to distinguish between the accommodation of an individual organism to its environment and the gradual adaptation of a lineage of organisms through genetic change. • Cells and Energy: Teacher Resource CD
CONTENT STANDARD	**CA.10.**	**Biology/Life Sciences: Physiology: Organisms have a variety of mechanisms to combat disease. As a basis for understanding the human immune response:**
PERFORMANCE STANDARD	**10.d.**	Students know there are important differences between bacteria and viruses with respect to their requirements for growth and replication, the body's primary

		defenses against bacterial and viral infections, and effective treatments of these infections. • Cell Types and Organization: Teacher Resource CD
CONTENT STANDARD	**CA.4.**	**Earth Sciences: Energy in the Earth System: Energy enters the Earth system primarily as solar radiation and eventually escapes as heat. As a basis for understanding this concept:**
PERFORMANCE STANDARD	**4.b.**	Students know the fate of incoming solar radiation in terms of reflection, absorption, and photosynthesis. • Cells and Energy: Teacher Resource CD • Cellular World Unit 4 Lab 4 Activity 1 Investigating Carbon Cycling • Cellular World Unit 4 Lab 4 Activity 3 Investigating Plant Pigments
CONTENT STANDARD	**CA.1.**	**Investigation and Experimentation: Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other four strands, students should develop their own questions and perform investigations. Students will:**
PERFORMANCE STANDARD	**1.a.**	Select and use appropriate tools and technology (such as computer-linked probes, spreadsheets, and graphing calculators) to perform tests, collect data, analyze relationships, and display data. • Cellular World Unit 1 Lab 1 Activity 1 Learning About Cell Types • Cellular World Unit 1 Lab 1 Activity 2 Learning About Cell Organization • Cellular World Unit 2 Lab 2 Activity 1 Comparison of Plant and Animal Cell Organelles • Cellular World Unit 2 Lab 2 Activity 2 Identification of DNA and RNA in Plant Cells • Cellular World Unit 2 Lab 2 Activity 3 Identification of Mitochondria • Cellular World Unit 2 Lab 2 Activity 4 Plant Cell Structure and Function • Cellular World Unit 3 Lab 3 Activity 1 Osmoregulation in Cells • Cellular World Unit 3 Lab 3 Activity 2 Osmosis and Diffusion in Model Cells • Cellular World Unit 4 Lab 4 Activity 1 Investigating Carbon Cycling • Cellular World Unit 4 Lab 4 Activity 2 A Closer Look at Catalase • Cellular World Unit 4 Lab 4 Activity 3 Investigating Plant Pigments • Cellular World Unit 5 Lab 5 Activity 1 Growth and Preparation of Onion Roots • Cellular World Unit 5 Lab 5 Activity 2 Observing the Cell Cycle in Onion Roots • Cellular World Unit 5 Lab 5 Activity 3 Modeling Mitosis • Cellular World Unit 5 Lab 5 Activity 4 Modeling Meiosis and Fertilization • Cellular World Unit 6 Lab 6 Activity 1 Understanding Why Cells Aren't Big • Cellular World Unit 6 Lab 6 Activity 2 Investigating Cell Growth Curves • Cellular World Unit 7 Lab 7 Activity 1 Developing a Biochemical Test for Catalase • Why Cells Aren't Big: Virtual Lab
PERFORMANCE STANDARD	**1.d.**	Formulate explanations by using logic and evidence. • Cellular World Unit 2 Lab 2 Activity 1 Comparison of Plant and Animal

		Cell Organelles • Cellular World Unit 2 Lab 2 Activity 2 Identification of DNA and RNA in Plant Cells • Cellular World Unit 2 Lab 2 Activity 3 Identification of Mitochondria • Cellular World Unit 2 Lab 2 Activity 4 Plant Cell Structure and Function
PERFORMANCE STANDARD	**1.e.**	Solve scientific problems by using quadratic equations and simple trigonometric, exponential, and logarithmic functions. • Cellular World Unit 6 Lab 6 Activity 1 Understanding Why Cells Aren't Big • Cellular World Unit 6 Lab 6 Activity 2 Investigating Cell Growth Curves • Cellular World Unit 7 Lab 7 Activity 1 Developing a Biochemical Test for Catalase
PERFORMANCE STANDARD	**1.f.**	Distinguish between hypothesis and theory as scientific terms. • Cellular World Unit 7 Lab 7 Activity 1 Developing a Biochemical Test for Catalase
PERFORMANCE STANDARD	**1.g.**	Recognize the usefulness and limitations of models and theories as scientific representations of reality. • Cellular World Unit 3 Lab 3 Activity 1 Osmoregulation in Cells • Cellular World Unit 3 Lab 3 Activity 2 Osmosis and Diffusion in Model Cells • Cellular World Unit 5 Lab 5 Activity 3 Modeling Mitosis • Cellular World Unit 5 Lab 5 Activity 4 Modeling Meiosis and Fertilization • Cellular World Unit 6 Lab 6 Activity 1 Understanding Why Cells Aren't Big
PERFORMANCE STANDARD	**1.k.**	Recognize the cumulative nature of scientific evidence. • Cell Types and Organization: Teacher Resource CD

Grade 10

CONTENT STANDARD	**CA.3.**	**Chemistry: Conservation of Matter and Stoichiometry: The conservation of atoms in chemical reactions leads to the principle of conservation of matter and the ability to calculate the mass of products and reactants. As a basis for understanding this concept:**
PERFORMANCE STANDARD	**3.a.**	Students know how to describe chemical reactions by writing balanced equations. • Cellular World Unit 4 Lab 4 Activity 2 A Closer Look at Catalase
CONTENT STANDARD	**CA.6.**	**Chemistry: Solutions: Solutions are homogenous mixtures of two or more substances. As a basis for understanding this concept:**
PERFORMANCE STANDARD	**6.c.**	Students know temperature, pressure, and surface area affect the dissolving process. • Cellular World Unit 4 Lab 4 Activity 3 Investigating Plant Pigments
PERFORMANCE	**6.f.**	Students know how molecules in a solution are separated or purified by the methods

STANDARD		of chromatography and distillation. • Cells and Energy: Teacher Resource CD
CONTENT STANDARD	**CA.8.**	**Chemistry: Reaction Rates: Chemical reaction rates depend on factors that influence the frequency of collision of reactant molecules. As a basis for understanding this concept:**
PERFORMANCE STANDARD	**8.a.**	Students know the rate of reaction is the decrease in concentration of reactants or the increase in concentration of products with time. • Cells and Energy: Teacher Resource CD • Cellular World Unit 4 Lab 4 Activity 2 A Closer Look at Catalase • Cellular World Unit 7 Lab 7 Activity 1 Developing a Biochemical Test for Catalase
PERFORMANCE STANDARD	**8.b.**	Students know how reaction rates depend on such factors as concentration, temperature, and pressure. • Cells and Energy: Teacher Resource CD • Cellular World Unit 4 Lab 4 Activity 2 A Closer Look at Catalase • Cellular World Unit 7 Lab 7 Activity 1 Developing a Biochemical Test for Catalase
PERFORMANCE STANDARD	**8.c.**	Students know the role a catalyst plays in increasing the reaction rate. • Cellular World Unit 4 Lab 4 Activity 2 A Closer Look at Catalase • Cellular World Unit 7 Lab 7 Activity 1 Developing a Biochemical Test for Catalase
CONTENT STANDARD	**CA.1.**	**Biology/Life Sciences: Cell Biology: The fundamental life processes of plants and animals depend on a variety of chemical reactions that occur in specialized areas of the organism's cells. As a basis for understanding this concept:**
PERFORMANCE STANDARD	**1.a.**	Students know cells are enclosed within semipermeable membranes that regulate their interaction with their surroundings. • Cell Structure and Function: Teacher Resource CD • Cell Types and Organization: Teacher Resource CD • Cellular World Unit 1 Lab 1 Activity 1 Learning About Cell Types • Cellular World Unit 1 Lab 1 Activity 2 Learning About Cell Organization • Cellular World Unit 2 Lab 2 Activity 1 Comparison of Plant and Animal Cell Organelles • Cellular World Unit 2 Lab 2 Activity 3 Identification of Mitochondria • Cellular World Unit 3 Lab 3 Activity 1 Osmoregulation in Cells
PERFORMANCE STANDARD	**1.b.**	Students know enzymes are proteins that catalyze biochemical reactions without altering the reaction equilibrium and the activities of enzymes depend on the temperature, ionic conditions, and the pH of the surroundings. • Cell Structure and Function: Teacher Resource CD • Cells and Energy: Teacher Resource CD • Cellular World Unit 4 Lab 4 Activity 2 A Closer Look at Catalase • Cellular World Unit 7 Lab 7 Activity 1 Developing a Biochemical Test

		for Catalase
PERFORMANCE STANDARD	**1.c.**	Students know how prokaryotic cells, eukaryotic cells (including those from plants and animals), and viruses differ in complexity and general structure. • Cell Structure and Function: Teacher Resource CD • Cell Types and Organization: Teacher Resource CD • Cellular World Unit 1 Lab 1 Activity 1 Learning About Cell Types • Cellular World Unit 1 Lab 1 Activity 2 Learning About Cell Organization • Cellular World Unit 7 Lab 7 Activity 1 Developing a Biochemical Test for Catalase
PERFORMANCE STANDARD	**1.d.**	Students know the central dogma of molecular biology outlines the flow of information from transcription of ribonucleic acid (RNA) in the nucleus to translation of proteins on ribosomes in the cytoplasm. • Cellular World Unit 5 Lab 5 Activity 3 Modeling Mitosis • Cellular World Unit 5 Lab 5 Activity 4 Modeling Meiosis and Fertilization
PERFORMANCE STANDARD	**1.e.**	Students know the role of the endoplasmic reticulum and Golgi apparatus in the secretion of proteins. • Cell Process: Teacher Resource CD • Cell Reproduction and the Cell Cycle: Teacher Resource CD • Cell Structure and Function: Teacher Resource CD • Cell Types and Organization: Teacher Resource CD • Cells and Energy: Teacher Resource CD • Cellular World Unit 1 Lab 1 Activity 1 Learning About Cell Types • Cellular World Unit 1 Lab 1 Activity 2 Learning About Cell Organization • Cellular World Unit 2 Lab 2 Activity 1 Comparison of Plant and Animal Cell Organelles • Cellular World Unit 2 Lab 2 Activity 2 Identification of DNA and RNA in Plant Cells • Cellular World Unit 2 Lab 2 Activity 3 Identification of Mitochondria • Cellular World Unit 2 Lab 2 Activity 4 Plant Cell Structure and Function
PERFORMANCE STANDARD	**1.f.**	Students know usable energy is captured from sunlight by chloroplasts and is stored through the synthesis of sugar from carbon dioxide. • Cells and Energy: Teacher Resource CD • Cellular World Unit 4 Lab 4 Activity 1 Investigating Carbon Cycling • Cellular World Unit 4 Lab 4 Activity 3 Investigating Plant Pigments
PERFORMANCE STANDARD	**1.g.**	Students know the role of the mitochondria in making stored chemical-bond energy available to cells by completing the breakdown of glucose to carbon dioxide. • Cell Process: Teacher Resource CD • Cell Reproduction and the Cell Cycle: Teacher Resource CD • Cell Structure and Function: Teacher Resource CD • Cell Types and Organization: Teacher Resource CD • Cells and Energy: Teacher Resource CD • Cellular World Unit 1 Lab 1 Activity 1 Learning About Cell Types

		• Cellular World Unit 1 Lab 1 Activity 2 Learning About Cell Organization • Cellular World Unit 2 Lab 2 Activity 1 Comparison of Plant and Animal Cell Organelles • Cellular World Unit 2 Lab 2 Activity 2 Identification of DNA and RNA in Plant Cells • Cellular World Unit 2 Lab 2 Activity 3 Identification of Mitochondria • Cellular World Unit 2 Lab 2 Activity 4 Plant Cell Structure and Function • Cellular World Unit 4 Lab 4 Activity 1 Investigating Carbon Cycling • Cellular World Unit 4 Lab 4 Activity 2 A Closer Look at Catalase
PERFORMANCE STANDARD	**1.j**	Students know how eukaryotic cells are given shape and internal organization by a cytoskeleton or cell wall or both. • Cell Structure and Function: Teacher Resource CD • Cell Types and Organization: Teacher Resource CD • Cellular World Unit 1 Lab 1 Activity 1 Learning About Cell Types • Cellular World Unit 1 Lab 1 Activity 2 Learning About Cell Organization • Cellular World Unit 7 Lab 7 Activity 1 Developing a Biochemical Test for Catalase
CONTENT STANDARD	**CA.2.**	**Biology/Life Sciences: Genetics: Mutation and sexual reproduction lead to genetic variation in a population. As a basis for understanding this concept:**
PERFORMANCE STANDARD	**2.a.**	Students know meiosis is an early step in sexual reproduction in which the pairs of chromosomes separate and segregate randomly during cell division to produce gametes containing one chromosome of each type. • Cell Reproduction and the Cell Cycle: Teacher Resource CD • Cellular World Unit 5 Lab 5 Activity 4 Modeling Meiosis and Fertilization
PERFORMANCE STANDARD	**2.b.**	Students know only certain cells in a multicellular organism undergo meiosis. • Cell Reproduction and the Cell Cycle: Teacher Resource CD • Cellular World Unit 5 Lab 5 Activity 4 Modeling Meiosis and Fertilization
PERFORMANCE STANDARD	**2.c.**	Students know how random chromosome segregation explains the probability that a particular allele will be in a gamete. • Cell Reproduction and the Cell Cycle: Teacher Resource CD • Cellular World Unit 5 Lab 5 Activity 4 Modeling Meiosis and Fertilization
PERFORMANCE STANDARD	**2.d.**	Students know new combinations of alleles may be generated in a zygote through the fusion of male and female gametes (fertilization). • Cellular World Unit 5 Lab 5 Activity 4 Modeling Meiosis and Fertilization
PERFORMANCE STANDARD	**2.e.**	Students know why approximately half of an individual's DNA sequence comes from each parent. • Cell Growth: Teacher Resoruce CD

		• Cell Reproduction and the Cell Cycle: Teacher Resource CD • Cell Types and Organization: Teacher Resource CD • Cellular World Unit 5 Lab 5 Activity 4 Modeling Meiosis and Fertilization • Cellular World Unit 6 Lab 6 Activity 2 Investigating Cell Growth Curves
PERFORMANCE STANDARD	**2.f.**	Students know the role of chromosomes in determining an individual's sex. • Cell Reproduction and the Cell Cycle: Teacher Resource CD • Cell Structure and Function: Teacher Resource CD • Cellular World Unit 1 Lab 1 Activity 2 Learning About Cell Organization • Cellular World Unit 2 Lab 2 Activity 2 Identification of DNA and RNA in Plant Cells • Cellular World Unit 5 Lab 5 Activity 2 Observing the Cell Cycle in Onion Roots • Cellular World Unit 5 Lab 5 Activity 3 Modeling Mitosis • Cellular World Unit 5 Lab 5 Activity 4 Modeling Meiosis and Fertilization
CONTENT STANDARD	**CA.3.**	**Biology/Life Sciences: Genetics: A multicellular organism develops from a single zygote, and its phenotype depends on its genotype, which is established at fertilization. As a basis for understanding this concept:**
PERFORMANCE STANDARD	**3.d.**	Students know how to use data on frequency of recombination at meiosis to estimate genetic distances between loci and to interpret genetic maps of chromosomes. • Cell Reproduction and the Cell Cycle: Teacher Resource CD • Cell Structure and Function: Teacher Resource CD • Cellular World Unit 1 Lab 1 Activity 2 Learning About Cell Organization • Cellular World Unit 2 Lab 2 Activity 2 Identification of DNA and RNA in Plant Cells • Cellular World Unit 5 Lab 5 Activity 2 Observing the Cell Cycle in Onion Roots • Cellular World Unit 5 Lab 5 Activity 3 Modeling Mitosis • Cellular World Unit 5 Lab 5 Activity 4 Modeling Meiosis and Fertilization
CONTENT STANDARD	**CA.4.**	**Biology/Life Sciences: Genetics: Genes are a set of instructions encoded in the DNA sequence of each organism that specify the sequence of amino acids in proteins characteristic of that organism. As a basis for understanding this concept:**
PERFORMANCE STANDARD	**4.d.**	Students know specialization of cells in multicellular organisms is usually due to different patterns of gene expression rather than to differences of the genes themselves. • Cell Types and Organization: Teacher Resource CD • Cellular World Unit 1 Lab 1 Activity 2 Learning About Cell Organization • Cellular World Unit 2 Lab 2 Activity 2 Identification of DNA and RNA in Plant Cells
CONTENT STANDARD	**CA.5.**	**Biology/Life Sciences: Genetics: The genetic composition of cells can be altered by incorporation of exogenous DNA into the cells. As a basis for understanding this concept:**
PERFORMANCE STANDARD	**5.a.**	Students know the general structures and functions of DNA, RNA, and protein.

		• Cellular World Unit 2 Lab 2 Activity 2 Identification of DNA and RNA in Plant Cells
PERFORMANCE STANDARD	5.b.	Students know how to apply base-pairing rules to explain precise copying of DNA during semiconservative replication and transcription of information from DNA into mRNA. • Cellular World Unit 5 Lab 5 Activity 3 Modeling Mitosis • Cellular World Unit 5 Lab 5 Activity 4 Modeling Meiosis and Fertilization
CONTENT STANDARD	**CA.6.**	**Biology/Life Sciences: Ecology: Stability in an ecosystem is a balance between competing effects. As a basis for understanding this concept:**
PERFORMANCE STANDARD	6.b.	Students know how to analyze changes in an ecosystem resulting from changes in climate, human activity, introduction of nonnative species, or changes in population size. • Cellular World Unit 6 Lab 6 Activity 2 Investigating Cell Growth Curves
PERFORMANCE STANDARD	6.c.	Students know how fluctuations in population size in an ecosystem are deter-mined by the relative rates of birth, immigration, emigration, and death. • Cellular World Unit 6 Lab 6 Activity 2 Investigating Cell Growth Curves
PERFORMANCE STANDARD	6.g.	Students know how to distinguish between the accommodation of an individual organism to its environment and the gradual adaptation of a lineage of organisms through genetic change. • Cells and Energy: Teacher Resource CD
CONTENT STANDARD	**CA.10.**	**Biology/Life Sciences: Physiology: Organisms have a variety of mechanisms to combat disease. As a basis for understanding the human immune response:**
PERFORMANCE STANDARD	10.d.	Students know there are important differences between bacteria and viruses with respect to their requirements for growth and replication, the body's primary defenses against bacterial and viral infections, and effective treatments of these infections. • Cell Types and Organization: Teacher Resource CD
CONTENT STANDARD	**CA.4.**	**Earth Sciences: Energy in the Earth System: Energy enters the Earth system primarily as solar radiation and eventually escapes as heat. As a basis for understanding this concept:**
PERFORMANCE STANDARD	4.b.	Students know the fate of incoming solar radiation in terms of reflection, absorption, and photosynthesis. • Cells and Energy: Teacher Resource CD • Cellular World Unit 4 Lab 4 Activity 1 Investigating Carbon Cycling • Cellular World Unit 4 Lab 4 Activity 3 Investigating Plant Pigments
CONTENT STANDARD	**CA.1.**	**Investigation and Experimentation: Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other four strands, students should develop their own questions and perform investigations. Students will:**

PERFORMANCE STANDARD	**1.a.**	Select and use appropriate tools and technology (such as computer-linked probes, spreadsheets, and graphing calculators) to perform tests, collect data, analyze relationships, and display data. • Cellular World Unit 1 Lab 1 Activity 1 Learning About Cell Types • Cellular World Unit 1 Lab 1 Activity 2 Learning About Cell Organization • Cellular World Unit 2 Lab 2 Activity 1 Comparison of Plant and Animal Cell Organelles • Cellular World Unit 2 Lab 2 Activity 2 Identification of DNA and RNA in Plant Cells • Cellular World Unit 2 Lab 2 Activity 3 Identification of Mitochondria • Cellular World Unit 2 Lab 2 Activity 4 Plant Cell Structure and Function • Cellular World Unit 3 Lab 3 Activity 1 Osmoregulation in Cells • Cellular World Unit 3 Lab 3 Activity 2 Osmosis and Diffusion in Model Cells • Cellular World Unit 4 Lab 4 Activity 1 Investigating Carbon Cycling • Cellular World Unit 4 Lab 4 Activity 2 A Closer Look at Catalase • Cellular World Unit 4 Lab 4 Activity 3 Investigating Plant Pigments • Cellular World Unit 5 Lab 5 Activity 1 Growth and Preparation of Onion Roots • Cellular World Unit 5 Lab 5 Activity 2 Observing the Cell Cycle in Onion Roots • Cellular World Unit 5 Lab 5 Activity 3 Modeling Mitosis • Cellular World Unit 5 Lab 5 Activity 4 Modeling Meiosis and Fertilization • Cellular World Unit 6 Lab 6 Activity 1 Understanding Why Cells Aren't Big • Cellular World Unit 6 Lab 6 Activity 2 Investigating Cell Growth Curves • Cellular World Unit 7 Lab 7 Activity 1 Developing a Biochemical Test for Catalase • Why Cells Aren't Big: Virtual Lab
PERFORMANCE STANDARD	**1.d.**	Formulate explanations by using logic and evidence. • Cellular World Unit 2 Lab 2 Activity 1 Comparison of Plant and Animal Cell Organelles • Cellular World Unit 2 Lab 2 Activity 2 Identification of DNA and RNA in Plant Cells • Cellular World Unit 2 Lab 2 Activity 3 Identification of Mitochondria • Cellular World Unit 2 Lab 2 Activity 4 Plant Cell Structure and Function
PERFORMANCE STANDARD	**1.e.**	Solve scientific problems by using quadratic equations and simple trigonometric, exponential, and logarithmic functions. • Cellular World Unit 6 Lab 6 Activity 1 Understanding Why Cells Aren't Big • Cellular World Unit 6 Lab 6 Activity 2 Investigating Cell Growth Curves • Cellular World Unit 7 Lab 7 Activity 1 Developing a Biochemical Test for Catalase
PERFORMANCE STANDARD	**1.f.**	Distinguish between hypothesis and theory as scientific terms. • Cellular World Unit 7 Lab 7 Activity 1 Developing a Biochemical Test

		for Catalase
PERFORMANCE STANDARD	**1.g.**	Recognize the usefulness and limitations of models and theories as scientific representations of reality. • Cellular World Unit 3 Lab 3 Activity 1 Osmoregulation in Cells • Cellular World Unit 3 Lab 3 Activity 2 Osmosis and Diffusion in Model Cells • Cellular World Unit 5 Lab 5 Activity 3 Modeling Mitosis • Cellular World Unit 5 Lab 5 Activity 4 Modeling Meiosis and Fertilization • Cellular World Unit 6 Lab 6 Activity 1 Understanding Why Cells Aren't Big
PERFORMANCE STANDARD	**1.k.**	Recognize the cumulative nature of scientific evidence. • Cellular World Unit 1 Lab 1 Activity 1 Learning About Cell Types • Cellular World Unit 1 Lab 1 Activity 2 Learning About Cell Organization
PERFORMANCE STANDARD	**1.l.**	Analyze situations and solve problems that require combining and applying concepts from more than one area of science. • Cellular World Unit 1 Lab 1 Activity 1 Learning About Cell Types • Cellular World Unit 1 Lab 1 Activity 2 Learning About Cell Organization • Cellular World Unit 2 Lab 2 Activity 1 Comparison of Plant and Animal Cell Organelles • Cellular World Unit 2 Lab 2 Activity 2 Identification of DNA and RNA in Plant Cells • Cellular World Unit 2 Lab 2 Activity 3 Identification of Mitochondria • Cellular World Unit 2 Lab 2 Activity 4 Plant Cell Structure and Function • Cellular World Unit 3 Lab 3 Activity 1 Osmoregulation in Cells • Cellular World Unit 3 Lab 3 Activity 2 Osmosis and Diffusion in Model Cells • Cellular World Unit 4 Lab 4 Activity 1 Investigating Carbon Cycling • Cellular World Unit 4 Lab 4 Activity 2 A Closer Look at Catalase • Cellular World Unit 4 Lab 4 Activity 3 Investigating Plant Pigments • Cellular World Unit 5 Lab 5 Activity 1 Growth and Preparation of Onion Roots • Cellular World Unit 5 Lab 5 Activity 2 Observing the Cell Cycle in Onion Roots • Cellular World Unit 5 Lab 5 Activity 3 Modeling Mitosis • Cellular World Unit 5 Lab 5 Activity 4 Modeling Meiosis and Fertilization • Cellular World Unit 6 Lab 6 Activity 1 Understanding Why Cells Aren't Big • Cellular World Unit 6 Lab 6 Activity 2 Investigating Cell Growth Curves • Cellular World Unit 7 Lab 7 Activity 1 Developing a Biochemical Test for Catalase • Why Cells Aren't Big: Virtual Lab
PERFORMANCE STANDARD	**1.m.**	Investigate a science-based societal issue by researching the literature, analyzing data, and communicating the findings. Examples of issues include irradiation of food, cloning of animals by somatic cell nuclear transfer, choice of energy sources,

		and land and water use decisions in California. • Cellular World Unit 1 Lab 1 Activity 1 Learning About Cell Types • Cellular World Unit 1 Lab 1 Activity 2 Learning About Cell Organization • Cellular World Unit 2 Lab 2 Activity 1 Comparison of Plant and Animal Cell Organelles • Cellular World Unit 2 Lab 2 Activity 2 Identification of DNA and RNA in Plant Cells • Cellular World Unit 2 Lab 2 Activity 3 Identification of Mitochondria • Cellular World Unit 2 Lab 2 Activity 4 Plant Cell Structure and Function • Cellular World Unit 3 Lab 3 Activity 1 Osmoregulation in Cells • Cellular World Unit 3 Lab 3 Activity 2 Osmosis and Diffusion in Model Cells • Cellular World Unit 4 Lab 4 Activity 1 Investigating Carbon Cycling • Cellular World Unit 4 Lab 4 Activity 2 A Closer Look at Catalase • Cellular World Unit 4 Lab 4 Activity 3 Investigating Plant Pigments • Cellular World Unit 5 Lab 5 Activity 1 Growth and Preparation of Onion Roots • Cellular World Unit 5 Lab 5 Activity 2 Observing the Cell Cycle in Onion Roots • Cellular World Unit 5 Lab 5 Activity 3 Modeling Mitosis • Cellular World Unit 5 Lab 5 Activity 4 Modeling Meiosis and Fertilization • Cellular World Unit 6 Lab 6 Activity 1 Understanding Why Cells Aren't Big • Cellular World Unit 6 Lab 6 Activity 2 Investigating Cell Growth Curves • Cellular World Unit 7 Lab 7 Activity 1 Developing a Biochemical Test for Catalase • Why Cells Aren't Big: Virtual Lab
PERFORMANCE STANDARD	**1.n.**	Know that when an observation does not agree with an accepted scientific theory, the observation is sometimes mistaken or fraudulent (e.g., the Piltdown Man fossil or unidentified flying objects) and that the theory is sometimes wrong (e.g., the Ptolemaic model of the movement of the Sun, Moon, and planets). • Cellular World Unit 1 Lab 1 Activity 1 Learning About Cell Types • Cellular World Unit 1 Lab 1 Activity 2 Learning About Cell Organization