
Course Description

Subject: Science **Grade:** 7

Overview:

Seventh grade science is one of the five core academic courses that meet Monday through Friday the entire year. The focus is on life science, and includes a strong emphasis on Creation, both as taught in Scripture, and as seen in what has been created. Scientific investigation, earth's history, evolution, cells, genetics, taxonomy, human biology, and the physical principles that underlie biological structure and function are the major topics of study throughout the year. A variety of group and individual laboratory investigations are included in the instruction to allow students a "hands-on" approach.

Primary Biblical Integration:

Genesis 1:1 "In the beginning God created the heavens and the earth."

Colossians 1:16 "For by Him all things were created...visible and invisible."

Psalms 139:14 "I praise you because I am fearfully and wonderfully made..."

Unit Description:

- 1.) CLASSROOM PROCEDURES/INTRODUCTION TO LIFE SCIENCE: Students are given a structure within which the instruction of the course will take place. Students are presented with the skills and methods of scientific inquiry.
- 2.) CREATION/EVOLUTION/EARTH HISTORY: The Christian worldview is compared and contrasted with the Naturalistic worldview in the areas of understanding the origin of life and the diversity of life forms found on earth, as well as the history of the earth itself..
- 3.) CELL BIOLOGY/GENETICS: Cell structure, function, and processes are studied, ending with an emphasis on genetics and heredity.
- 4.) STRUCTURE AND FUNCTION IN LIVING SYSTEMS/INVESTIGATION AND EXPERIMENTATION: Students will practice science-related skills as part of making careful investigations in understanding the complementary relationship between biological structures and their function.
- 5.) STRUCTURE/FUNCTION IN LIVING SYSTEMS: Students are introduced to the levels of organization common to most organisms. A study of human biology, and its underlying physical principles, completes the course.

Student Materials:

Focus on California Life Science SE, Prentice Hall, 2008, 0132012723

Focus on California Life Science Lab Manual SE, Prentice Hall, 2008, 0132034247

Teacher Materials:

Focus on California Life Science TE, Prentice Hall, 2008, 0132012731

Focus on California Life Science Color Transparencies, Prentice Hall, 2008, 0132034530



Focus on CA Life Science Standards Review Transparencies, Prentice Hall, 2008, 0132034549
Unit 1 Teaching Resources – Chapters 1-4, Prentice Hall, 2008, 0132034697
Unit 2 Teaching Resources – Chapters 5-8, Prentice Hall, 2008, 0132034700
Unit 3 Teaching Resources – Chapters 9-12, Prentice Hall, 2008, 0132034719
Unit 4 Teaching Resources – Chapters 13-16, Prentice Hall, 2008, 0132034735
Focus on California Life Science Laboratory Manual, TE, Prentice Hall, 2008, 0132034336
Chapter Tests Levels A and B, Prentice Hall, 2008, 013203462X
Reading and Note Taking Guide Level A, Prentice Hall, 2008, 0132034417
Reading and Note Taking Guide Level B, Prentice Hall, 2008, 0132034425
Vocabulary Flashcards, Prentice Hall, 2008, 0132034298
Progress Monitoring Assessments, Prentice Hall, 2008, 013203459X
Lab Zone Easy Planner, Prentice Hall, 2008, 0132035324
Success Tracker, Prentice Hall, 2008, 0133609367
Prentice Hall Presentation Express, Prentice Hall, 2008, 0132035332
Prentice Hall Exam View Test Bank CD-ROM, Prentice Hall, 2008, 0132035243
Prentice Hall Science Explorer Video Explorations, Prentice Hall, 2008, 0131903683
Prentice Hall Lab Activity DVD, Prentice Hall, 2008, 0132035383
Prentice Hall Teaching Guidebook for Universal Access, Prentice Hall, 2008, 0132034271
Prentice Hall Inquiry Skills Activity Book I, Prentice Hall, 2008, 0132034352
Prentice Hall Inquiry Skills Activity Book II, Prentice Hall, 2008, 0132034360
Prentice Hall Inquiry Skills Activity Book III, Prentice Hall, 2008, 0132034379
Prentice Hall Reading and Note Taking Guide Answer Key, Prentice Hall, 2008, 0132034484

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COURSE OUTLINE

Teacher's Name: Becky Abernethy		Subject: Life Science		# of Quarters: 4	
Text (if any): Prentice Hall <u>Focus on California Life Science</u>			Other Materials: Curriculum teaching resources, the Bible, <u>It All Begins With Genesis</u> curriculum, <u>Explore Evolution</u> and <u>Investigating Evolution</u> DVD, personal notes, various videos and DVDs, various science-related web sites, <u>United Streaming</u> video clips.		
Recurring Themes, Principles, Skills or Concepts:	Creation by the Intelligent Designer/Evolution/Earth's History	Scientific Investigation and Experimentation	Cell Biology and Genetics	Structure and Function in Living Systems	Physical Principles in Living Systems
Unit Title & Expected Start Date	Theme	Biblical Application	Key Concepts		
1) Classroom Procedures - Week 1	Structure and Order	"Add to knowledge, self-control..." 2 Peter 1:6-7	Personal responsibility		
2) Worldviews in Science/Scientific Investigation - Weeks 2-9	Creation/Evolution/Earth's History/Scientific Inquiry	"In the beginning God created..." Genesis 1:1	Worldview, creation, intelligent design, evolution, earth's history, scientific investigation and experimentation		
3) Cells/Genetics - Weeks 10-18	Creation/Cell Biology/Hereditiy and Genetics	"For by Him all things were created...visible and invisible." Col. 1:16	Cell structure and function, cellular processes, irreducible complexity, homeostasis, reproduction, genetics, heredity		
4) Structure and Function in Living Systems - Weeks 19-27	Creation/Structure and Function/Scientific Investigation	"For since the creation of the world, God's invisible qualities...have been clearly seen...Rom. 1:20	Taxonomy, photosynthesis, autotroph, heterotroph, homeostasis, metabolism, reproduction, energy, scientific methodology		
5) Structure and Function in the Human Body - Weeks 28-36	Creation/Organ Systems/Physical Principles in Living Systems	"...fearfully and wonderfully made." Psalm 139:14	Levels of organization, homeostasis, energy, organ systems, physical principles in living systems		
6)					
7)					
8)					
9)					
10)					

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UNIT PLANNER

Teacher's Name: Becky Abernethy		Subject: Life Science		Period(s): P. 1, 2, 3, 5		
Unit #: 1	Dates - Starting: Week 1	Ending: Week 1	Total Instructional Days: 3			
Unit Title: Classroom Procedures						
Theme: Structure and Order						
Biblical Application: "Add to knowledge, self-control..." 2 Pet. 1:6-7 (These qualities render us useful to the Lord.)						
Key Concepts		Standards/Sub-Strands		Outcomes	Assessment	ESLRs
1) Personal responsibility will be practiced in the classroom.		NONE		Students will demonstrate their ability to follow stated classroom procedures.	Organizer checks, classwork checks, classroom preparedness.	#3b,c #4 b
2) Students will respect adults, classmates		NONE		Students will follow stated guidelines regarding showing respect for others.	Classroom behavior will be monitored.	#4c
3)						
4)						
5)						
Key Activities and Methods Life Science Class Contract, class cards, student organizer, student handbook.						

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UNIT PLANNER

Teacher's Name:	Becky Abernethy	Subject:	Life Science	Period(s)	1, 2, 3, 5
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Unit #:	2	Dates - Starting:	Week 1	Ending:	Week 8	Total Instructional Days:	37
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Unit Title: Worldviews in Science/Scientific Investigation

Theme: Creation/Scientific Inquiry Evolution/Earth's History

Biblical Application: "In the beginning God created..." Genesis 1:1 Students will see God the Creator as the author of science.

Key Concepts	Standards/Sub-Strands	Outcomes	Assessment	ESLRs
1) Creation/Biblical Worldview/Intelligent Design	None	Biblical Worldview Concept Map	Quiz #1	#1b, c, d
2) Scientific Inquiry/Investigation/Experimentation	Standard 7	Students will demonstrate the various skills of scientific inquiry during in-class warm ups.	Quiz #2	#3a, d #5b, c
3) Changes Over Time/Evolution	Standard 3	Students will demonstrate the various skills of scientific inquiry during in-class warm ups. They will model fossil formation and comparison of protein structure.	Quizzes #3-4 Standard 3 Benchmark	#3a, d #5b, c
4) Earth's History	Standard 4	Students will demonstrate the various skills of scientific inquiry and make models of rock formations.	Quizzes #5-6 Layers of Rock Benchmark Assessment Standard 4 Benchmark Assessment	
5)				

Key Activities and Methods: Read and discuss Genesis 1-11, using materials adapted from *It All Begins With Genesis*. Read, discuss, take notes, and practice concepts presented in Chapter 1, Chapter 7, and Chapter 8 of *Focus on California Life Science*. Use virtual and in-class labs, hands-on Standards Warm Ups, DVD Field Trips from *Science Explorer*, active art demonstrations, Power Point presentations from curriculum and from *Explore Evolution materials*.

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UNIT PLANNER

Teacher's Name: Becky Abernethy		Subject: Life Science		Period(s): 1, 2, 3, 5		
Unit #: 3	Dates - Starting: Week 9	Ending: Week 18	Total Instructional Days: 40			
Unit Title: Cells/Genetics						
Theme: Creation/Structure and Function/Energy and Stability						
Biblical Application: "For by Him all things were created...visible and invisible." Col. 1:16						
Key Concepts		Standards/Sub-Strands		Outcomes	Assessment	ESLRs
1) Nature of Life		#1a, f #3a, b		"Using the Microscope" Lab, Sect. 1-1 "Origin of Life", Sect. 1-2 "Characteristics of Living Things", Sect. 1-3 "Needs of Living Things", Sect. 1-4 "Chemistry of Living Things" worksheets.	Using the Microscope Lab, Chapter 1 quiz	#1b #2a,b #5a
2) Cell Structure and Function		#1b,c #5a #7a, d		Cells Chapter Group Project, Sect. 2-2 "Cell Structure and Function" worksheet, Lab: "Comparing Plant and Animal Cells".	Egg-speriment with a Cell Project, Chapter 2 Quiz	#3a-c #5b
3) Cell Processes		#1c,e,f #2e #7a		Sect 3-1 "Moving Materials Into and Out of Cells" and Sect. 3-2 "Cell Growth and Division" worksheets, "Discovering Cell Division" group activity.	Discovering Cell Division project, Online Onion Root Tips Activity, Chapter 3 quiz	#3a-d
4) Cell Energy		#1d #7a		Sect. 4-1 "Photosynthesis" and Sect. 4-2 "Respiration" worksheets, Lab: "Comparing Photosynthesis and Respiration".	Chapter 4 quiz, Respiration lab worksheet	#3a-d
5) Genetics		#2a-e #7b,d		Genetic Science Learning Center Interactive Web Activity, "Mendel's Work" & "Probability and Genetics" worksheets, Make the Right Call lab, DNA Modeling lab	GSLC Web Activity worksheet, lab worksheets, Genetics quizzes	#3a #5b, c
Key Activities and Methods: Section Review and Reinforcement worksheets, various microscope skill labs using plant and animal cells, Internet Learning projects, Egg-speriment with a Cell project, class demonstrations, Make the Right Call and DNA Modeling labs, DVD "Where Does the Evidence Lead?" and chapter quizzes.						

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UNIT PLANNER

Teacher's Name: Becky Abernethy		Subject: Life Science		Periods 1, 2, 3, 4, 5		
Unit #: 4	Dates - Starting: Week 19	Ending: Week 27	Total Instructional Days: 43			
Unit Title: Designing an Experiment/Classification of Life						
Theme: Creation/Structure and Function/Energy and Stability/Scientific Inquiry						
Biblical Application: "For since the creation of the world God's invisible qualities - His eternal power and divine nature - have been clearly seen, being understood from what has been made, so that men are without excuse." Romans 1:20						
Key Concepts		Standards/Sub-Strands		Outcomes	Assessment	ESLRs
1) Designing an Experiment		#7c		Skills worksheets on the Scientific Method, including Posing Questions, Developing a Hypothesis, Operational Definitions, Analyzing & Displaying Data, Making Conclusions	Skills worksheets, quizzes, Do Antibacterial Products Work? Investigation	#3a-c #5b
2) Binomial Nomenclature/Taxonomy/The Six Kingdoms		#3a, d #7d		Section Review & Reinforcement worksheets, Organizing a Junk Drawer activity	Chapter quiz	#3a-c #5b
3) Structure and Function/ Metabolism/ Reproduction		#5 a, b, f #7a,b,d,e		Section Review & Reinforcement worksheets, Comparing Protists lab, flower dissection lab	Lab worksheets, chapter quizzes, Cycle of a Lifetime project and poster	#1c #2a-d #5a-c
4)						
5)						
Key Activities and Methods: Class reading and discussion using section Review and Reinforcement and skills worksheets, group Discovery Activities, various labs, Do Antibacterial Products Work investigation, Cycle of a Lifetime project, videos "Icons of Evolution" and "Amazing Animals That Defy Evolution."						

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UNIT PLANNER

Teacher's Name: Becky Abernethy		Subject: Life Science		Period(s): 1, 2, 3, 4, 5	
Unit #: 5	Dates - Starting: Week 28	Ending: Week 36	Total Instructional Days: 40		
Unit Title: Human Biology/Physical Principle of Living Systems					
Theme: Creation/Structure and Function/Systems and Interactions/Stability					
Biblical Application: "...fearfully and wonderfully made." Psalm 139:14					
Key Concepts	Standards/Sub-Strands	Outcomes	Assessment	ESLRs	
1) Levels of Organization	#5a, b #7a,d	Discovering Levels of Organization Activity, Sect. 1-1 "The Body as a Whole" and Sect. 1-2 "Levels of Organization" worksheets. Exploring Body Tissues lab	Discovering Levels of Activity group work, lab worksheet, Chapter 1 quiz	#5c #3a, b	
2) Systems and Interactions/ Creation/Physical Principles in Living Systems	#5a-g #6a-j #7a, d, e	Section Review & Reinforcement worksheets, Measuring Your Pulse lab, MyPyramid Tracker internet activity, Modeling Eye Optics, rat dissection.	Lab worksheets, Chapter quizzes, project and presentation assessment	#3a, b, c, d #1b #5a	
3)					
4)					
5)					
Key Activities and Methods: Discussion and reading of textbook along with use of Review & Reinforcement worksheets, skills labs, Discovering Levels of Organization group activity, My Pyramid internet activity, Moody video on Human Body, rat dissection lab					

PACING GUIDE
Subject: Science
Grade: 7
Total number of standards: 7

Quarter	Units Taught	Standards Taught	Standards Assessed
1	Introduction to Science Creation/Evolution/Earth's History	3, 4 and 7	3 and 4
2	Cell Biology/Genetics	1, 2 and 7	1 and 2
3	Structure & Function/Scientific Investigation	5 and 7	7
4	Structure & Function/Physical Principles in Living Systems	5, 6 and 7	5 and 6
Omitted Standards and why	NONE		

HEIGHTS CHRISTIAN JUNIOR HIGH SCHOOL

Mission Statement

"Our mission is to educate students to know Christ personally, excel academically, think biblically, and positively impact their community for Christ."

Expected Schoolwide Learning Results (ESLRs)

1. Biblical World View

Graduates of HCJH are expected to be individuals who . . .

- a) know how to study the Bible.
- b) recognize that all people are created in the image of the one true God.
- c) acknowledge the Bible as the infallible Word of God.
- d) use God's Word to discern truth.

2. Effective Communicators

Graduates of HCJH are expected to be effective communicators who . . .

- a) listen objectively and critically.
- b) understand and follow directions.
- c) write and speak clearly and accurately.
- d) express and support opinions using objective evidence.
- e) utilize various modalities effectively.
- f) can demonstrate a personal relationship with Jesus Christ verbally and in writing.

3. Proficient Learners

Graduates of HCJH are expected to be proficient learners who . . .

- a) demonstrate grade appropriate skills in reading, writing, and mathematics.
- b) have effective work habits and study skills.
- c) are self-directed and able to produce cooperatively and independently.
- d) can utilize technology.
- e) have a firm grasp of scripture and are able to apply it to life situations.

4. Personal Responsibility

Graduates of HCJH are expected to be responsible individuals who . . .

- a) show patriotism through respect for flag, country, leaders and laws.
- b) demonstrate self-control based on biblical standards.
- c) exhibit respect for others.
- d) accept the consequences and benefits of their actions.
- e) are aware of career opportunities.
- f) practice goal setting with a biblical perspective.
- g) are involved in serving the community.
- h) have a personal relationship with Jesus Christ.
- i) have the tools to share their faith.
- j) demonstrate an urgency to share their faith.

5. Problem Solvers

Graduates of HCJH are expected to be perceptive thinkers and problem solvers who . . .

- a) evaluate current topics using a biblical perspective.
- b) use available technology to obtain, access and integrate relevant information.
- c) think analytically and creatively.
- d) are well-informed and open-minded.
- e) apply academic learning to life.

6. Well-Rounded

Graduates of HCJH are expected to be well-rounded individuals who . . .

- a) have been exposed to a variety of elective opportunities and experiences.
- b) are challenged beyond academics through a variety of extracurricular activities.
- c) lead lives that are balanced intellectually, spiritually, physically and emotionally.
- d) develop an appreciation for teamwork during school activities.
- e) understand God's involvement in every area of their lives.

Grade Seven**Focus on Life Sciences.****Cell Biology**

1. 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:

- Students know* cells function similarly in all living organisms.
- Students know* the characteristics that distinguish plant cells from animal cells, including chloroplasts and cell walls.
- Students know* the nucleus is the repository for genetic information in plant and animal cells.
- Students know* that mitochondria liberate energy for the work that cells do and that chloroplasts capture sunlight energy for photosynthesis.
- Students know* cells divide to increase their numbers through a process of mitosis, which results in two daughter cells with identical sets of chromosomes.
- Students know* that as multicellular organisms develop, their cells differentiate.

Genetics

2. 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 understanding this concept:

- Students know* the differences between the life cycles and reproduction methods of sexual and asexual organisms.
- Students know* sexual reproduction produces offspring that inherit half their genes from each parent.
- Students know* an inherited trait can be determined by one or more genes.
- Students know* plant and animal cells contain many thousands of different genes and typically have two copies of every gene. The two copies (or alleles) of the gene may or may not be identical, and one may be dominant in determining the phenotype while the other is recessive.
- Students know* DNA (deoxyribonucleic acid) is the genetic material of living organisms and is located in the chromosomes of each cell.

Evolution

3. Biological evolution accounts for the diversity of species developed through gradual processes over many generations. As a basis for understanding this concept:

- Students know* both genetic variation and environmental factors are causes of evolution and diversity of organisms.
- Students know* the reasoning used by Charles Darwin in reaching his conclusion that natural selection is the mechanism of evolution.
- Students know* how independent lines of evidence from geology, fossils, and comparative anatomy provide the bases for the theory of evolution.
- Students know* how to construct a simple branching diagram to classify living groups of organisms by shared derived characteristics and how to expand the diagram to include fossil organisms.
- Students know* that extinction of a species occurs when the environment changes and the adaptive characteristics of a species are insufficient for its survival.

Earth and Life History (Earth Sciences)

4. Evidence from rocks allows us to understand the evolution of life on Earth. As a basis for understanding this concept:

- Students know* Earth processes today are similar to those that occurred in the past and slow geologic processes have large cumulative effects over long periods of time.

**Advanced 1
Life Sciences**

- Analyze a model to determine parts of a cycle in the environment
- Analyze a model to predict the effects of a change in an ecosystem
- Interpret a model of changes in a cell
- Use a model to identify a characteristic of a body system
- Use models and keys to scientifically identify organisms
- Evaluate given adaptations for their functions in organisms
- Identify causes of growth in organisms
- Identify possible changes caused by introduced species
- Apply an understanding of the importance of structural adaptations
- Identify an interrelationship between organisms in an ecosystem
- Identify a relationship between abiotic and biotic parts of ecosystems

Earth Sciences

- Apply an understanding of the causes of a given landform
- Use a model to predict the relative age of rock

- b. *Students know* the history of life on Earth has been disrupted by major catastrophic events, such as major volcanic eruptions or the impacts of asteroids.
- c. *Students know* that the rock cycle includes the formation of new sediment and rocks and that rocks are often found in layers, with the oldest generally on the bottom.
- d. *Students know* that evidence from geologic layers and radioactive dating indicates Earth is approximately 4.6 billion years old and that life on this planet has existed for more than 3 billion years.
- e. *Students know* fossils provide evidence of how life and environmental conditions have changed.
- f. *Students know* how movements of Earth's continental and oceanic plates through time, with associated changes in climate and geographic connections, have affected the past and present distribution of organisms.
- g. *Students know* how to explain significant developments and extinctions of plant and animal life on the geologic time scale.

Structure and Function in Living Systems

5. The anatomy and physiology of plants and animals illustrate the complementary nature of structure and function. As a basis for understanding this concept:

- a. *Students know* plants and animals have levels of organization for structure and function, including cells, tissues, organs, organ systems, and the whole organism.
- b. *Students know* organ systems function because of the contributions of individual organs, tissues, and cells. The failure of any part can affect the entire system.
- c. *Students know* how bones and muscles work together to provide a structural framework for movement.
- d. *Students know* how the reproductive organs of the human female and male generate eggs and sperm and how sexual activity may lead to fertilization and pregnancy.
- e. *Students know* the function of the umbilicus and placenta during pregnancy. f. *Students know* the structures and processes by which flowering plants generate pollen, ovules, seeds, and fruit.
- g. *Students know* how to relate the structures of the eye and ear to their functions.

Physical Principles in Living Systems (Physical Sciences)

6. Physical principles underlie biological structures and functions. As a basis for understanding this concept:

- a. *Students know* visible light is a small band within a very broad electromagnetic spectrum.
- b. *Students know* that for an object to be seen, light emitted by or scattered from it must be detected by the eye.
- c. *Students know* light travels in straight lines if the medium it travels through does not change.
- d. *Students know* how simple lenses are used in a magnifying glass, the eye, a camera, a telescope, and a microscope.
- e. *Students know* that white light is a mixture of many wavelengths (colors) and that retinal cells react differently to different wavelengths.
- f. *Students know* light can be reflected, refracted, transmitted, and absorbed by matter.
- g. *Students know* the angle of reflection of a light beam is equal to the angle of incidence.
- h. *Students know* how to compare joints in the body (wrist, shoulder, thigh) with structures used in machines and simple devices (hinge, ball-and-socket, and sliding joints).
- i. *Students know* how levers confer mechanical advantage and how the application of this principle applies to the musculoskeletal system.
- j. *Students know* that contractions of the heart generate blood pressure and that heart valves prevent

layers

- Interpret a model of a rock cycle
- Analyze a model of changes in Earth's surface
- Use a model to identify the results of changes in Earth's surface
- Interpret a model of a geochemical cycle
- Use a model to identify the cause of differences in Earth's temperatures
- Use models to apply an understanding of weather phenomena
- Use information to predict soil characteristics
- Recognize the results of the position of a planet on the seasons
- Identify the causes of changes on Earth

Physical Sciences

- Use information to compare characteristics of substances
- Apply an understanding of chemical formulas
- Identify causes of changes of pitch in sounds
- Identify sources of heat
- Apply an understanding of the results of motion of an object
- Apply an understanding of kinetic energy of motion
- Identify a unit of measure associated with motion
- Use information to predict the results of a behavior of light
- Recognize chemical changes in substances
- Identify methods of separating substances in mixtures

backflow of blood in the circulatory system.

Investigation and Experimentation

7. 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:

- 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.
- b. Use a variety of print and electronic resources (including the World Wide Web) to collect information and evidence as part of a research project.
- c. Communicate the logical connection among hypotheses, science concepts, tests conducted, data collected, and conclusions drawn from the scientific evidence.
- d. Construct scale models, maps, and appropriately labeled diagrams to communicate scientific knowledge (e.g., motion of Earth's plates and cell structure).
- e. Communicate the steps and results from an investigation in written reports and oral presentations.

- Identify devices used to convert energy from one form to another

Nature of Science

- Evaluate graphic representations of data
 - Interpret information about uses of chemical substances
 - Use observations to predict characteristics of objects
 - Analyze a graph of data
 - Make a prediction based on given information
- Identify the use of tools in science