LANGUAGE AND/OR LEARNING DISABILITY PROGRAM - SCIENCE

Grade Level: 9-12 plus

Credits: 5

BOARD OF EDUCATION ADOPTION DATE:

AUGUST 31, 2009

SUPPORTING RESOURCES AVAILABLE IN DISTRICT RESOURCE SHARING
APPENDIX A: ACCOMMODATIONS AND MODIFICATIONS
APPENDIX B: ASSESSMENT EVIDENCE
APPENDIX C: INTERDISCIPLINARY CONNECTIONS
FREEHOLD REGIONAL HIGH SCHOOL DISTRICT

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Course Philosophy

The Science course of the Language and/or Learning Disabilities Program is designed to give students an understanding of the various fields of science. The intent of this course is to provide each student opportunity to acquire knowledge of major scientific concepts presented throughout the high school career. From this conceptual base, students will be encouraged to foster critical thinking skills, to apply knowledge and to identify the real-life significance of Science.

Course Description

The LLD Science course provides students opportunity to acquire knowledge and skills in a variety of sciences offered in the Freehold Regional High School District. Students will acquire knowledge in areas of science to include: Biology; Chemistry; Astronomy and Space Science; Earth Science; Environmental Studies and Physics. The curriculum is constructed to address and reinforce the New Jersey Core Content Workplace Readiness Skills as well as the New Jersey Core Curriculum Content Standards for Science. The New Jersey Core Content Workplace Readiness Skills are embedded within each unit of study. The New Jersey Core Curriculum Content Science Standards (5.1 Scientific Processes, 5.2 Science and Society, 5.3 Mathematical Applications, 5.4 Nature and Process of Technology, 5.5 Characteristics of Life, 5.6 Physical Science-Chemistry, 5.7 Physical Science-Physics, 5.8 Earth Science, 5.9 Astronomy & Space Science, and 5.10 Environmental Studies) are the foundation for this curriculum. Interdisciplinary learning in reading, writing and computation will be integrated while providing for the differentiated learning styles of students.

The units and topics covered in the Language and/or Learning Disabilities Program curriculum are as follows:

- Scientific Inquiry, Safety, Mathematical Applications, Science and Technology
- Biology: Matter, Energy, and Living Systems
- Biology: Characteristics of Life
- Chemistry: The Atom
- Physics
- Earth Science
- Astronomy and Space
- Biology: Environmental Studies
<table>
<thead>
<tr>
<th>Relevant Standards</th>
<th>Enduring Understandings</th>
<th>Essential Questions</th>
<th>Assessments</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1A1, B1-2, C1</td>
<td>The scientific method provides steps to answer questions and solve problems. Safety procedures are in place for the study of science.</td>
<td>How do you solve problems in your daily life? What can experiments tell us? Why is an awareness of safety important?</td>
<td>Diagnostic (before): Pre tests, Oral Discussion, Picture manipulation, Diagnostic Testing-assess prior knowledge. Formative (during): Written assignments, Brief quizzes-written or oral to check understanding. Summative (after): Safety Contract, Teacher questioning, Scoring rubric.</td>
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<td>5.2B 1</td>
<td>People the world over and from throughout history, have contributed to the continual advancement of science and technology.</td>
<td>Who were some of the significant contributing scientists and what were their contributions to, e.g., laws of motion, Cell Theory etc.?</td>
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<td>5.3B1 5.3D1</td>
<td>Mathematical applications such as graphs and measurement are used as tools in science.</td>
<td>Why do we use measurements in science? How are graphs used in science?</td>
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<td>5.4A1</td>
<td>Science and technology are mutually supportive in driving innovations in both areas.</td>
<td>How do science and technology work together?</td>
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<td>5.5A1-4</td>
<td>The natural world is defined by organisms and life processes which conform to principles regarding matter and energy. Knowledge of these principles can contribute to quality of life.</td>
<td>What are the characteristics of living things? Where do living things obtain energy? What is the structure and function of a cell? What are the major systems of the body? What is the Theory of Evolution? How are living things classified? Why do you look similar to your parents? What is DNA?</td>
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| 5.5B1-2 5.5C1     | Living organisms may be defined by similar characteristics that are passed from one generation to the next. Theories exist that indicate that characteristics of organisms within a species may have changed over time. | What characteristics do all living organisms share?  
What is the Cell Theory?  
What are the structure and function of the cell membrane and organelles?  
How are macromolecules essential to everyday living?  
How and why do you sort things every day?  
What do the words evolution and extinct mean to you?  
Why do you look like your parents?  
What is a gene? | Assessments (before) Formative (during) Summative (after) |
| 5.6A1-2, 5.6A5 5.6B1 | Matter is composed of atoms. There exist three states of matter. The Periodic Table of Elements contains every known element classified by the number of protons in each atom. | What is an atom?  
What are the three states of matter?  
What is the Periodic Table used for?  
What is a chemical reaction?  
Who is Dimitri Mendeleev? | Assessments (before) Formative (during) Summative (after) |
| 5.7A2-3 5.7B1-2  | There exists a relationship between force and motion. Various forms of energy exist, move through materials, and transform from one form to another. | How is an object's motion as well as its change in motion described?  
What happens when an object exerts force on another object?  
What are the effects of gravity?  
How is energy transferred?  
Why is energy constant in a closed system?  
Who is Sir Isaac Newton? | Assessments (before) Formative (during) Summative (after) |
| 5.8A1 5.8B1 5.8C1 | The Earth is a planet composed of interrelated systems which are ever changing and therefore contribute to the dynamic nature of the planet. Some naturally occurring systems may be modified by human activity. | What are the components of the Earth?  
How do weather and climate affect the Earth?  
How has the Earth changed through history? | Assessments (before) Formative (during) Summative (after) |
<table>
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<td>5.9A1 5.9B1 5.9D1</td>
<td>The universe is composed of galaxies, each of which is composed of solar systems having the same elements and governed by the same laws. The planets and their moons move in predictable patterns. The sun is a star.</td>
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<tr>
<td>5.10A1</td>
<td>Some naturally occurring systems may be modified by human activity.</td>
<td>Which patterns occur as a result of interaction between the Sun, Earth and Earth’s moon? How are the planets of our solar system alike/different? What are the elements necessary for sustaining life in Earth? What characteristics does our sun share with other stars? Is there an order to the universe?</td>
<td>Oral Discussion Do Now Video clips Diagnostic Testing- for prior knowledge</td>
</tr>
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<td>5.10B1</td>
<td>Human activity may positively or negatively impact the environment.</td>
<td>How is human activity affecting the climate positively and negatively? How is human activity affecting the ozone positively and negatively? How is human activity affecting erosion positively and negatively? How is human activity affecting endangered species positively and negatively?</td>
<td>Written Assignments Online Research Daily Quizzes-written or oral</td>
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</tbody>
</table>

Projects Unit tests-oral or written
<table>
<thead>
<tr>
<th>Unit Title</th>
<th>Unit Understandings and Goals</th>
<th>Recommended Duration</th>
</tr>
</thead>
</table>
| Unit #1: Scientific Inquiry, Safety, Mathematical Applications, Science and Technology          | Common scientific processes are employed by scientists to investigate the world around us, to depict scientific findings and to develop and share theory.  
  1. The students will recognize processes that scientists employ and how they may pertain to daily life.                                                                 | 6 weeks              |
| Unit #2: Biology: Characteristics of Life                                                        | The natural world is defined by the variety of organisms that have changed over time and are grouped in a taxonomy based upon similar traits passed from one generation to the next.  
  1. The students will gain an understanding of diversity, biological evolution, heredity and the relationships among matter, energy and living systems. | 6 weeks              |
| Unit #3: Chemistry: The Atom                                                                     | Matter is composed of atoms. The Periodic Table of Elements organizes elements to reflect their properties.  
  1. The students will understand the significance of the structure of matter.                     | 4 weeks              |
| Unit #4: Physics                                                                                 | Natural laws apply to the concepts of motion, force and energy transfer.  
  1. The student will gain understanding that there exists a defined relationship among, energy, Force and motion. | 4 weeks              |
| Unit #5: Earth Science                                                                           | The Earth is ever-changing and is composed of interconnected systems. Some naturally occurring systems that may be modified by human activity.  
  1. The Earth is dynamic in nature due to the interrelationships of natural systems and human activity affecting the state of the geosphere, atmosphere and hydrosphere. | 5 weeks              |
| Unit #6: Astronomy and Space                                                                     | Our solar system is part of the Milky Way Galaxy, one of many in the universe.  
  1. The students will recognize the vast composition of the universe and will describe the patterns of movement among plants, suns, and moons. | 4 weeks              |
| Unit #7: Environmental Studies                                                                   | Human activities impact the cycling of matter and the flow of energy through ecosystems.  
  1. The students will demonstrate knowledge of the effects humans have on the environment and will discover ways in which they may contribute positively to environmental concerns. | 5 weeks              |
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Unit #1: Scientific Method and Measurements

**Enduring Understanding:** Common scientific processes are employed by scientists to investigate the world around us, to depict scientific findings and to develop and share theory.

**Essential Questions:**
- How do you solve problems in your daily life?
- Why is an awareness of safety important?
- How are graphs used in science?
- What can experiments tell us?
- Why do we use measurements in science?
- How do science and technology work together?

**Unit Goal:** The students will recognize processes that scientists employ and how they may pertain to daily life.

**Duration of Unit:** 6 weeks

**NJCCCS:** 5.1A1, B1-2, C1, 5.3B1, 5.3D1, 5.4A1

<table>
<thead>
<tr>
<th>Guiding / Topical Questions</th>
<th>Content, Themes, Concepts, and Skills</th>
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<th>Teaching Strategies</th>
<th>Assessment Strategies</th>
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<td>What are the safety rules that must be followed when conducting experiments?</td>
<td>Understand and apply information, skills, and procedures developed from the district safety program as it directly relates to the study of science.</td>
<td>District safety rules Worksheets</td>
<td>Read aloud the district-wide safety rules. Show lab safety equipment in the classroom: fire extinguisher, fume hood, safety shower, eyewash, and fire blanket and demonstrate how to use them. Provide the students with illustrations of safety procedure not being followed. Students then circle and verbally explain what is wrong and what would be the correct procedure. Role-play the safety procedures correctly.</td>
<td>Provide a lab that will demonstrate the use of appropriate equipment, techniques, and safety. Observe students during the actual lab and review their procedures in regards to techniques and safety. Students must sign and have parental signature of the safety contract. Students must pass a safety quiz.</td>
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<tr>
<td>How can you solve a problem or answer a question using the Scientific Method?</td>
<td>Review steps to the scientific method and be sure to include: observation, hypothesis, prediction, and control vs. experimental group, and independent vs. dependent variable.</td>
<td>Solve a problem using the Scientific Method with students. Worksheets</td>
<td>Group Activity: Organize students in groups to solve a problem using the scientific method. Students manipulate steps into the correct order</td>
<td>Students present the group activity and have discussion. Verbal Quiz on Scientific Method.</td>
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<td>How is data generated, displayed, and analyzed?</td>
<td>Discuss procedures for making line, pie, and bar graphs.</td>
<td>Demonstrate how to create a line, pie, and bar graphs by giving sample data.</td>
<td>Read and interpret given graphs containing data to which students may relate.</td>
<td>Collect and grade graphs.</td>
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<td>Worksheets with examples</td>
<td>Give students a topic and survey the class to obtain data and have them develop a graph.</td>
<td>Quiz on graphing.</td>
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<td>Provide graphing exercise with given data.</td>
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<td>What are the base units of measurements in the SI System?</td>
<td>Define length, weight, volume and temperature.</td>
<td>Demonstrate equipment that would be used to measure length, weight, volume and temperature.</td>
<td>Complete worksheet, board work, or graphic organizer on measurement, base unit, and equipment.</td>
<td>Written and oral responses to academic prompts.</td>
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<td>Discuss the equipment used to measure length, weight, volume, and temperature.</td>
<td>Give worksheet with practice problems, allow to students to identify the information.</td>
<td>Lab Report</td>
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<td>Discuss the base units for length, weight, volume, and temperature.</td>
<td>Students identify items in the home measured in metrics or used in metric quantities</td>
<td>Quiz on Measurement</td>
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<td>Paper Measurement Lab</td>
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<td>How do we use technology in science?</td>
<td>Identify instruments of technology used in science including microscopes, computers, balances, etc.</td>
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<td>Identify scientific discoveries made possible through the invention of technology as well as the evolution of technology through the advancement of science.</td>
<td>Students identify names and uses of different instruments of technology</td>
<td>Quiz on technology instrument identification</td>
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<td>Allow students to use as many types of technology as possible</td>
<td>Unit Test</td>
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<td>Discuss microscope and MRI machine as tools to advance science and vice versa.</td>
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**Suggestions on how to differentiate in this unit:**
- Give copies of notes to students instead of having them read them.
- Tape an oral version of the notes for those that cannot read.
- Complete the lab as a class activity instead of individual groups.
- Use pictures as notes instead of written words.
- Suggested demonstration: ice water balloon activity
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Unit #2 Biology: Characteristics of Life

Enduring Understanding: The natural world is defined by the variety of organisms that have changed over time and are grouped in a taxonomy based upon similar traits passed from one generation to the next.

Essential Questions:  
What are the characteristics of living things?  
Where do living things obtain energy?  
What is the structure and function of a cell?  
What are the major systems of the body?  
What is the Theory of Evolution?  
How are living things classified?  
Why do you look similar to your parents?  
What is DNA?

Unit Goal: The students will gain an understanding of diversity, biological evolution, heredity and the relationships among matter, energy and living systems.

Duration of Unit: 6 weeks  
NJCCCS: 5.2B1, 5.5A1-4, 5.5B1-2, 5.5C1

<table>
<thead>
<tr>
<th>Guiding / Topical Questions</th>
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</thead>
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<tr>
<td>What is the difference between living and non-living things?</td>
<td>Discriminate between living and non-living things using criteria.</td>
<td>Current textbook and resource binders</td>
<td>Class discussion. Students work in pairs, create two lists containing living and non-living things. List the characteristics of the living organisms.</td>
<td>Written or Oral Assignment</td>
</tr>
</tbody>
</table>
| What are the characteristics of a living thing? | Criteria used to determine whether or not an object is living | Pictures  
Graphic organizers | List the characteristics of living things.  
Given characteristics, students identify objects as living or non-living.  
Students work in pairs use checklist of characteristics to determine if an object is living or non-living.  
Students make collage of pictures of living things. | Class participation  
Project assessment  
Cooperative learning experience |
| What is Cell Theory? | Ideas that constitute Cell Theory. | Internet resources. | List components of cell theory. Use video clips to illustrate. | Class discussion |
| What is the structure and function of cell parts? | Basic parts of a cell and their functions.  
Difference/similarities between plant and animal cells. | Activities  
Models  
Illustrations  
Internet displays | Students make an edible cell. Use jello-like substance as cytoplasm. Insert objects to represent cell parts.  
Students color illustrations of plant and animal cell parts using same colors for similar parts and single colors for parts that are found in one cell type only.  
Students create a poster labeling plant and animal | Project  
Class work |
<table>
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| How do cells and multicellular organisms obtain energy? | Living things produce and expend energy.  
Purpose and relationship between cellular respiration and photosynthesis.  
Organisms, energy and the food chain | Internet displays and interactive activities  
Illustrations  
Diagram  
Graphic Organizer  
Role play | Explain that one characteristic of living things is the need for and expenditure of energy.  
Inform students that energy begins at the cellular level.  
Explain that animal and plant cells both require food for energy.  
Allow students to role-play as a plant and an animal in terms of obtaining food for energy.  
Show illustration of the cycle of photosynthesis and cellular respiration. Students color in parts as teacher provides explanation.  
Show and design food web and chain.  
Students observe the food chain by setting up an aquarium or terrarium using various organisms.  
Role play an organism in the food chain. Become more energized at each level as organisms are consumed. | Class discussion and participation  
Multimedia presentations  
Role play  
Diagram |
| What are the basic functions of the major systems of the human body? | Hierarchy of cells, tissues, organs, and organ systems  
Interrelationships among major organ systems.  
Some diseases lead to organ system failure | Graphic organizers  
Activities  
Illustrations  
Manipulatives  
Audio and visual aids  
Manipulatives  
Internet displays and interactive activities | Use student every day experiences to explain various components, e.g., ask students the meaning off “cardio” as it relates to their Physical Education class. Explain the relationship to the cardio-vascular (heart-lungs) system of the body. Ask what happens to food after students eat lunch. Tie in digestive system. Relate to transfer of energy.  
Use pictures and video clips to illustrate each system. Discuss interrelationships in terms of energy.  
Students create poster of one organ system. Class discussion regarding interrelationships among systems.  
Discuss diseases that may lead to system failure. | Class discussion and participation  
Multimedia presentations  
Projects  
Rubrics  
Cooperative learning experiences |
<table>
<thead>
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<td>How are all living things recorded and organized?</td>
<td>System for the classification of living things</td>
<td>Current textbooks and resource binders</td>
<td>Describe characteristics of various types of organisms within a single species. Ex. Dogs. Classify according to similar traits.</td>
<td>Written or Oral Assignments</td>
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<td>Student worksheets</td>
<td>Class discussion</td>
<td>Project assessments</td>
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<td>Demonstrations</td>
<td>Give students various items to classify using their own method. Determine criteria that they used via suggestion and discussion.</td>
<td>Class participation</td>
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<td>Graphic Organizers</td>
<td>Play match game. Match pictures to correct kingdom</td>
<td>Classification Quiz</td>
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<td>Define heredity and the role DNA plays in inheritance of traits</td>
<td>Internet resources</td>
<td>Utilize flashcards to divide animals into kingdoms</td>
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<td>Genes determine individual traits/characteristics.</td>
<td>Current textbooks and resource binders</td>
<td>Report on a specific kingdom</td>
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<td>Traits are passed from one generation to another.</td>
<td>Student worksheets</td>
<td>Make a collage of living things belonging to a particular kingdom.</td>
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<td>Each organism is the result of inheritance of parental genes. Dominant traits are expressed over recessive.</td>
<td>Demonstrate Punnett square</td>
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<td>Use a Punnett square to determine chance of genetic outcomes.</td>
<td>Internet</td>
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<td>Recognize the contribution of Gregor Mendel to inheritance.</td>
<td>Video clips</td>
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<td>What is evolution?</td>
<td>Theory of evolution</td>
<td>Current textbooks</td>
<td>Discuss why animals like the dinosaurs and wooly mammoth no longer exist.</td>
<td>Project assessment</td>
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<td>Adaptation and environmental factors may affect natural selection.</td>
<td>Evolution PowerPoint</td>
<td>Make a gene data sheet. Students will observe members of their family. Note variations in traits.</td>
<td>Written or oral assignments</td>
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<td>Individuals vary within a species. Some are more likely to survive to reproduce.</td>
<td>Video clips</td>
<td>Students complete a project that demonstrates an animal may have changed over generations. I.e. monkey, horse</td>
<td>Discussion participation</td>
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<td>History of evolutionary theory (Charles Darwin etc.)</td>
<td>Internet</td>
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<td>Unit Test</td>
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**Suggestions on how to differentiate in this unit:**
- For nonverbal students, use pointing motions to discuss the topics covered
- For family tree project use verbal skills if students completing the project is not possible or use pictures instead of words
- Give students classification areas and then have them cut and paste objects into the boxes instead of having them create the areas

Enduring Understanding: Matter is composed of atoms. The Periodic Table of Elements organizes elements to reflect their properties.
Essential Questions: What is an atom?  
What are the three states of matter?  
What is the Periodic Table used for?  
What is a chemical reaction?  
Who is Dimitri Mendeleev?  

Unit Goal: The students will understand the significance of the structure of matter.
Duration of Unit: 4 weeks
NJCCCS: 5.2B1, 5.6A1-2, 5.6A5, 5.6B1

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| What is the difference between a solid, liquid and a gas? | Identify the properties of a solid, a liquid and a gas. | Pictures  
Models | Ask students if they used blocks to build something, beads to make jewelry etc.?  
Label pictures and objects in the classroom as a solid, liquid or gas  
Make collage of pictures  
Label water, an ice cube and steam (may use pictures) as a solid, liquid or gas | Class participation  
Collage project |
| What is an atom? | History of Atomic Theory  
Discuss atoms as the building block for matter.  
Structure of the atom - subatomic particles | Model of an atom  
Current Textbooks  
PowerPoint presentation demonstrating how the parts of an atom fit together. | Students draw and label the atom as it exists now  
Discussion of why atoms are important  
Web quest on an important scientist to atomic theory | Project Assessment  
Written and oral assignments  
Parts of an Atom Quiz |
<table>
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<td>What is a chemical reaction?</td>
<td>Some chemical substances may react with each other resulting in change.</td>
<td>Metal containing rust. District approved chemicals</td>
<td>Show examples. Name chemicals involved. Describe resulting change. Ex: Oxygen and Iron yield rust</td>
<td>Class participation and discussion.</td>
</tr>
<tr>
<td>What is the periodic table?</td>
<td>Parts of the periodic table i.e. groups and periods Parts of each element block i.e. atomic number, atomic mass, chemical symbol, chemical name History of the Periodic Table Classification of elements into metals, nonmetals, metalloids Importance of element’s placement on periodic table Periodic Trends Recognize contribution of Dimitri Mendeleev regarding the Periodic table.</td>
<td>Periodic Table reprints Periodic Table PowerPoint presentation Current Textbooks Periodic Trends PowerPoint</td>
<td>Color Periodic Table to demonstrate the different areas of classification i.e. blue = metals Label one block of periodic table Activity where students figure out as much as possible using only the Periodic Table i.e. Helium has 2 protons, 2 electrons or Potassium shares some of the same characteristics as Sodium Utilize Periodic Table that contains pictures of elements as well as chemical symbol. Bring in samples of some elements to show students (ex. copper.) Place on Periodic Table. Text and pictures of Dimitri Mendeleev and his accomplishments.</td>
<td>Project assessment Written and oral assignments Periodic Table Quiz Unit Test</td>
</tr>
</tbody>
</table>

**Suggestions on how to differentiate in this unit:**
- For nonverbal students have them point to where a label should go instead of writing the labels
- Give students a word bank to use when labeling
- Helpful websites: Periodic Table- classified by state: [http://www.gtcocalcomp.com/erc/interwritebackgrounds/periodic_table_complete.jpg](http://www.gtcocalcomp.com/erc/interwritebackgrounds/periodic_table_complete.jpg); Blank Periodic Table: [http://www.sciencegeek.net/tables/CA_CST.pdf](http://www.sciencegeek.net/tables/CA_CST.pdf); Interactive periodic table: [www.webelements.com](http://www.webelements.com)
**Freehold Regional High School District**  
**LLD Science**  
**Unit #4 Physics**

**Enduring Understanding:** Natural laws apply to the concepts of motion, force and energy transfer.

**Essential Questions:**
- How is an object’s motion as well as its change in motion described?
- What happens when an object exerts force on another object?
- What are the effects of gravity?
- How is energy transferred?
- Why is energy constant in a closed system?
- Who is Sir Isaac Newton?

**Unit Goal:** The student will gain understanding that there exists a defined relationship among, energy, force and motion.

**Duration of Unit:** 4 weeks  
**NJCCCS:** 5.2B1, 5.7A 2-3, 5.7B1-2

<table>
<thead>
<tr>
<th>Guiding / Topical Questions</th>
<th>Content, Themes, Concepts, and Skills</th>
<th>Instructional Resources and Materials</th>
<th>Teaching Strategies</th>
<th>Assessment Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is the relationship between motion and force?</td>
<td>Determine if an object is moving. Recognize contribution of Sir Isaac Newton regarding the laws of motion. Determine forces that cause movement and can cause objects to stay together. Explain that when one object exerts force on another, force is also applied to the first object. Recognize gravity as a force of attraction between masses. Explain that heat, electricity, sound and light are forms of energy. Explain that energy can be transformed from one form to another.</td>
<td>Pictures Notes with illustrations Activities Role-play Power point presentations Manipulatives Internet displays and interactive activities Audio and visual aids</td>
<td>Students to remain still, then demonstrate movement using the body (waving, walking, jumping.) Demonstrate movement of objects. Show video clip of an outdoor and indoor scene. Students identify what is moving. Students push against an object incrementally using their hands until the object moves to demonstrate that force is applied not only to the object, but also to the hand. Think ,Pair, Share to discuss picture content Class activity on different types of forces Show the three laws of motion in action using video clips Frayer models of acceleration, gravity, and force</td>
<td>Science Journal Test and quizzes Cooperative and independent learning experiences Class work and homework Class discussion and participation Multimedia presentations Projects Self assessment Portfolio assessment Rubrics</td>
</tr>
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<tr>
<td></td>
<td>What is energy?</td>
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<td></td>
<td>Define energy</td>
<td>Current textbook and worksheets</td>
<td>Frayer model of energy</td>
<td>Written and oral assignments</td>
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<td></td>
<td>Define energy</td>
<td>PowerPoint presentation on energy and its many forms</td>
<td>Demonstrations of forms of energy i.e. light bulb = electrical + light + heat energy</td>
<td>Project assessment</td>
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<td></td>
<td>Forms of energy including kinetic, potential, mechanical, electrical, light, heat, etc.</td>
<td>Internet</td>
<td>Activity to find as many energy forms as possible in school</td>
<td>Participation in demonstrations</td>
</tr>
<tr>
<td></td>
<td>Forms of energy including kinetic, potential, mechanical, electrical, light, heat, etc.</td>
<td>Energy Video clips</td>
<td>Roller coaster activity demonstrating kinetic, potential, and mechanical energy</td>
<td>Energy Quiz</td>
</tr>
</tbody>
</table>

**Suggestions on how to differentiate in this unit:**
- Create pictorial descriptions of 3 laws instead of auditory notes.
- Instead of using frayer models, have students look at pictures that define terms.
- Useful Websites: Mini-labs on Newton: [http://teachers.net/lessons/posts/661.html](http://teachers.net/lessons/posts/661.html);
  Newton’s Laws of Motion Activities: [http://www.lth3.k12.il.us/tworivers/Pet%20Projects/Pam%20Winterroth/pam%20winterroth%27s%20final%20project/Newton%27s%20laws%20of%20motion%20activities%20page.html](http://www.lth3.k12.il.us/tworivers/Pet%20Projects/Pam%20Winterroth/pam%20winterroth%27s%20final%20project/Newton%27s%20laws%20of%20motion%20activities%20page.html)
Enduring Understanding: The Earth is ever-changing and is composed of interconnected systems. Some naturally occurring systems that may be modified by human activity.

Essential Questions:
- What are the components of the Earth?
- How do weather and climate affect the Earth?
- How has the Earth changed through history?

Unit Goal: The Earth is dynamic in nature due to the interrelationships of natural systems and human activity affecting the state of the geosphere, atmosphere and hydrosphere.

Duration of Unit: 5 weeks

NJCCCS: 5.8A1, 5.8B1, 5.8C1, 5.10A

<table>
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<tr>
<th>Guiding / Topical Questions</th>
<th>Content, Themes, Concepts, and Skills</th>
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<tbody>
<tr>
<td>What are the parts of the Earth?</td>
<td>Parts of the Earth i.e. crust, mantle, outer core, inner core Parts of the Earth’s atmosphere i.e. troposphere, stratosphere, mesosphere, thermosphere</td>
<td>Current textbooks and worksheets Illustrations Blank diagrams Internet PowerPoint Presentation on the parts of Earth and the atmosphere</td>
<td>Students label parts of the Earth on a blank diagram Students label parts of the atmosphere on a blank diagram Students list parts of the atmosphere with their altitude and temperatures.</td>
</tr>
<tr>
<td>What are the geosphere, hydrosphere, atmosphere and biosphere?</td>
<td>Describe elements of and discuss relationships among the geosphere, hydrosphere and atmosphere. Use the theory of plate tectonics to explain relationships among mountains, mid-ocean ridges, earthquakes and volcanoes.</td>
<td>Current textbooks and worksheets Illustrations Frayer model for vocabulary terms World map Globe Paper to represent plates</td>
<td>Group students. Give each group pictures representing each system. Ask students to group them under the categories land, water and air. Provide a model of the Earth, one container each of water, soil, and an empty container labeled air. Point to portions of the model of the Earth that relate to contents of each container. Students discuss view out of classroom window to determine which systems are visible and which are not. Students view video clips to identify relationships among systems represented. Students are given a map of the Earth and cards that represent each system. Students place cards on portions of the map that represent each system.</td>
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<tr>
<td>What are the effects of weather and climate on Earth?</td>
<td>Define climate and weather</td>
<td>PowerPoint presentation on the effects of climate and weather on Earth to include natural disasters</td>
<td>Students color map to demonstrate different types of climates in the world.</td>
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<tr>
<td></td>
<td>Different types of climate around the world</td>
<td>Current textbooks and worksheets</td>
<td>Discuss how people have adapted to climate change.</td>
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<td></td>
<td>Changes in climate over history</td>
<td>World map showing various climates.</td>
<td>Frayer model - climate</td>
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<td></td>
<td>Effects of climate (long term) and weather (short term) on Earth.</td>
<td>Articles categorizing the effects of human activity on climate.</td>
<td>Students research changes in climate over history and possible reasons for the changes.</td>
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<tr>
<td></td>
<td>Describe the effects of human activity on climate?</td>
<td>Internet resources</td>
<td>Students select one natural disaster and do research to find out more about the disaster. They can either write a report or create a presentation on the natural disaster.</td>
</tr>
</tbody>
</table>

Suggestions on how to differentiate in this unit:

- Instead of writing labels have students use Velcro to attach labels in the correct places.
- If students can’t color the map have them label or use Velcro.
- Instead of writing research, have them orally discuss, or type.
  Earth’s Atmospheric Layers: [http://starryskies.com/solar_system/Earth/atmosphere.jpg](http://starryskies.com/solar_system/Earth/atmosphere.jpg);
Enduring Understanding: Our solar system is part of the Milky Way Galaxy, one of many in the universe.

Essential Questions: Which patterns occur as a result of interaction between the Sun, Earth and Earth’s moon?
   - How are the planets of our solar system alike/different?
   - What are the elements necessary for sustaining life in Earth?
   - What characteristics does our sun share with other stars?
   - Is there an order to the universe?

Unit Goal: The students will recognize the vast composition of the universe and will describe the patterns of movement among plants, suns, and moons.

Duration of Unit: 4 weeks

NJCCCS: 5.9A1, 5.9B1, 5.9D1

<table>
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<th>Guiding / Topical Questions</th>
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<tbody>
<tr>
<td>What are the cycles of Earth, the moon, and the Sun?</td>
<td>Structure of our solar system as one of many in the Milky way Galaxy. Movement of planets and moons Concept of time related to movement of the Earth The sun as a star that may be at the center of a solar system around which planets revolve. The sun produces heat and light. The Earth’s revolution around the sun- 365 days to get around the sun, etc. The earth’s rotation – 24 hours The Lunar Cycle- 8 phases How the Earth stays on its cycle around the sun. Revisit gravity from Isaac Newton’s perspective</td>
<td>Current textbooks and worksheets PowerPoint presentation on the Lunar Cycle and the Earth’s Cycle Diagrams Models</td>
<td>Ask students to describe what they see when looking at the sky during the day and at night. Students create diagrams or models of our solar system Students role play movement in the solar system Students label moon phases on blank diagram including new moon, waxing crescent, first quarter, waxing gibbous, full moon, waning crescent, last quarter, waning gibbous Students categorize how long it takes the Earth to go around the sun Activity that demonstrates how the Earth stays on its path going around the sun Discuss how the sun is necessary for life.</td>
<td>Participation in discussion Project assessment Earth Cycles quiz</td>
</tr>
<tr>
<td>What are the components of our universe?</td>
<td>Define galaxy, universe, planet, solar system, star Components of our universe</td>
<td>Current textbooks and worksheets Frayer models of galaxy, universe, planet, solar system and star Students fill in diagram of the types of galaxies. Write about</td>
<td>Universe Quiz</td>
<td></td>
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</tbody>
</table>

20
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<tr>
<td>Types of galaxies</td>
<td></td>
<td>Diagrams of types of galaxies</td>
<td>their favorite type</td>
<td>assessment</td>
</tr>
<tr>
<td>Components of the solar system that contains Earth</td>
<td>Solar System diagram</td>
<td>Students fill in Solar System diagram</td>
<td>Students fill in Life Cycle of a Star. Discuss what point our big star the sun is in</td>
<td>Participation in Discussion</td>
</tr>
<tr>
<td>Types of Stars</td>
<td>Life Cycle of a Star</td>
<td>Universe</td>
<td></td>
<td>Written and Oral assignments</td>
</tr>
<tr>
<td>Life Cycle of a Star</td>
<td>Diagram of the universe</td>
<td>Universe PowerPoint presentation</td>
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</tbody>
</table>

- **Suggestions on how to differentiate in this unit:**
  - If students can't complete diagrams have them show demonstrate knowledge by pointing where the labels should go.
  - They may do a presentation on their favorite type of galaxy instead of writing.
  - The Life Cycle of a Star can be acted out.
Enduring Understanding: Human activities impact the cycling of matter and the flow of energy through ecosystems.

Essential Questions:
- How would you describe the climate in which you live?
  - How is our climate changing?
  - What does the ozone layer do for us?
  - How is the ozone changing?
  - What is erosion and deposition?
  - What are some naturally occurring examples and some made example of erosion?
  - Can you name some endangered species?
- How is human activity affecting the climate positively and negatively?
- How is human activity affecting the ozone positively and negatively?
- How is human activity affecting erosion positively and negatively?
- How is human activity affecting endangered species positively and negatively?

Unit Goal: The students will demonstrate knowledge of the human effect on the environment and will discover ways in which they may contribute positively to environmental concerns.

Duration of Unit: 5 weeks
NJCCCS: 5.10A1, 5.10B1

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<tr>
<td>How do humans affect the environment today? Positively? Negatively?</td>
<td>Discriminate between climate and weather. Identify climates as hot or cold, rainy or dry, seasonal. Define the purpose of the ozone layer. Define erosion. Define endangered species.</td>
<td>Pictures of various climates, e.g., desert, arctic, rain forest etc. Internet resources</td>
<td>Students describe pictures of climates. Chose a climate to illustrate. Shoe illustrations of ozone layer, eroded beaches and endangered species</td>
<td>Illustration Picture identification</td>
</tr>
<tr>
<td>What might “the balance of nature” mean?</td>
<td>Define balance, nature, naturally occurring, man-made, climate, ozone, erosion, deposition, endangered, species, environment and pollution. Distinguish naturally occurring process from those positively or negatively affected by human activity regarding climate change, ozone production, erosion and deposition and threatened and endangered species.</td>
<td>Current textbook and worksheets Internet resources Balance scale</td>
<td>Frayer models of naturally occurring, man-made, climate, ozone, erosion, deposition, endangered, species, pollution and environment. Video clips/pictures Role-play Use balance scale to illustrate how the addition of pollutants may shift the balance of nature. Discussion</td>
<td>Picture identification Participation</td>
</tr>
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<tr>
<td>How can humans help to prevent pollution?</td>
<td>Various types and causes of pollution Effects that students may have on the environment Types of receptacles are for certain types of trash and recycling Define ecosystem Environmental pollution and the water Cycle</td>
<td>Internet resources Trash receptacles used in school Diagram of Water Cycle PowerPoint Presentation on pollution</td>
<td>Use internet resources to show examples of polluted environments. Explain elements of the environment. Explain what environment might have been like prior to polluted state. Point out trash receptacles used in school for recycling purposes. Brainstorm ways in which students may help to protect the environment. Label water cycle Use the water cycle to explain the negative affects that pollution may have on the environment. Students select type of pollution and research and present on that topic and its effects. Students research ways of minimizing environmental pollution.</td>
<td>Participation in class discussion. Oral and written assignments</td>
</tr>
</tbody>
</table>

**Suggestions on how to differentiate in this unit:**
- Students may make a diorama on the water cycle instead of writing the labels.
- Students could go on a class trip to various places to learn about pollution.