SCOPE and SEQUENCE

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<tr>
<td><strong>MODULE 1</strong></td>
<td>2 WEEKS</td>
<td>• History of Science from Ancient times to the present</td>
<td>• Density in Nature</td>
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<tr>
<td>A Brief History of Science</td>
<td>A comprehensive overview of the history of science. Including the beginnings of</td>
<td>• Greek Scientists</td>
<td>• Atomic Motion</td>
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<td></td>
<td>scientific practices and the great scientists that have shaped our understanding of</td>
<td>• Newton</td>
<td>• A Chemical Reaction</td>
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<td></td>
<td>the world we know.</td>
<td></td>
<td>• Mapping the Paths of the Planets</td>
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<td><strong>MODULE 2</strong></td>
<td>2 WEEKS</td>
<td>• What science is Not</td>
<td>• Weight/Speed and falling objects</td>
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<tr>
<td>Scientific Inquiry</td>
<td>An introduction to and the practice of the scientific method. Included is a</td>
<td>• Scientific Method</td>
<td>• More about weight/speed and falling objects</td>
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<td></td>
<td>unique application of the scientific method to facts of Christianity.</td>
<td>• Limitations of science</td>
<td>• The Broken Flashlight</td>
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<td><strong>MODULE 3</strong></td>
<td>2 WEEKS</td>
<td>• Experiments and variables</td>
<td>• A Floating Egg</td>
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<tr>
<td>How to Analyze and Interpret Experiments</td>
<td>A young scientist learns how to analyze and interpret experimental results.</td>
<td>• Using experiments</td>
<td>• Which “Boat” Will Move?</td>
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<tr>
<td></td>
<td>Included is the application of reading and using graphs with experimentation.</td>
<td>• Recognizing experimental variables</td>
<td>• What Does Soap Do To Water? – 1</td>
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<tr>
<td><strong>MODULE 4</strong></td>
<td>2 WEEKS</td>
<td>• Interpreting experimental results</td>
<td>• What Does Soap Do To Water? - 2</td>
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<tr>
<td>Science, Applied Science and Technology</td>
<td>A lesson in distinguishing the differences between science, applied science and</td>
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<td>• The Lever</td>
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<tr>
<td></td>
<td>technology. Also an in depth study of simple machines and analyzing their</td>
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<td>• A Simulation of Using Multiple Pulleys</td>
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<td>advantages mathematically.</td>
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# Scope & Sequence

*Exploring Creation with General Science, 2nd Edition*

## SEMESTER I: QUARTER 2

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<tr>
<td><strong>MODULE 5</strong>&lt;br&gt;Archeology, Geology, and Paleontology</td>
<td>2 WEEKS&lt;br&gt;A brief introduction to life science. More specific focus is paid to the study of the history of life through archeology upon determining its validity.</td>
<td>• Archeology and history&lt;br&gt;• The internal test&lt;br&gt;• The external test&lt;br&gt;• The bibliographic test&lt;br&gt;• Relative dating</td>
<td>NONE</td>
</tr>
<tr>
<td><strong>MODULE 6</strong>&lt;br&gt;Foundations of Geology</td>
<td>2 WEEKS&lt;br&gt;An introduction to earth’s history through the rocks that make up the earth. Included is the study of two different viewpoints of how the earth was formed.</td>
<td>• Soil, rocks and minerals&lt;br&gt;• Sedimentary rocks&lt;br&gt;• Weathering&lt;br&gt;• Erosion&lt;br&gt;• Grand Canyon</td>
<td>• “Growing” Crystals&lt;br&gt;• Separation of Sedimentation&lt;br&gt;• Physical Weathering&lt;br&gt;• Chemical Weathering&lt;br&gt;• Erosion</td>
</tr>
<tr>
<td><strong>MODULE 7</strong>&lt;br&gt;The Fossil Record</td>
<td>2 WEEKS&lt;br&gt;A continuation of the study of two different viewpoints of how the earth was formed by learning about and studying the fossil record.</td>
<td>• Casts and molds&lt;br&gt;• Petrofication&lt;br&gt;• Carbonized remains&lt;br&gt;• Decomposition&lt;br&gt;• Uniformitarianism vs. Catastrophism</td>
<td>• Making a Fossil Cast&lt;br&gt;• Minerals in Water and Evaporation&lt;br&gt;• A Model of the Carbonization Process</td>
</tr>
<tr>
<td><strong>MODULE 8</strong>&lt;br&gt;Uniformitarianism and Catastrophism</td>
<td>2 WEEKS&lt;br&gt;A chapter dedicated solely to contrasting the two views of the earth’s formation history based on the knowledge obtained in the previous two chapters.</td>
<td>• Uniformitarianism and geology&lt;br&gt;• Uniformitarianism and evolution&lt;br&gt;• Catastrophism and the geological record and fossil record&lt;br&gt;• Uniformitarianism vs. Catastrophism&lt;br&gt;• Evolution</td>
<td>• A Simulation of Index Fossils for Ordering Rock Layers</td>
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## Scope & Sequence
Exploring Creation with General Science, 2nd Edition

### SEMESTER II: QUARTER 3

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<tr>
<td><strong>MODULE 9</strong>&lt;br&gt;What is Life?</td>
<td>2 WEEKS</td>
<td>DNA&lt;br&gt;Energy and life&lt;br&gt;Reproduction and life&lt;br&gt;The cell</td>
<td>Model of DNA&lt;br&gt;Finding Food in Plants&lt;br&gt;Simple “Self-Sustaining” System&lt;br&gt;Sensing and Responding to Change&lt;br&gt;Fruit Fly Reproduction</td>
</tr>
<tr>
<td><strong>MODULE 10</strong>&lt;br&gt;Classifying Life</td>
<td>2 WEEKS</td>
<td>Five kingdom system&lt;br&gt;Monera&lt;br&gt;Protista&lt;br&gt;Fungi&lt;br&gt;Plantae&lt;br&gt;Animalia</td>
<td>Bacterial Growth – 1&lt;br&gt;Bacterial Growth – 2&lt;br&gt;Yeast is a Decomposer&lt;br&gt;Vegetative Reproduction&lt;br&gt;Turgor Pressure</td>
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<tr>
<td><strong>MODULE 11</strong>&lt;br&gt;The Human Body: Fearfully and Wonderfully Made</td>
<td>2 WEEKS</td>
<td>Superstructure of human body&lt;br&gt;Skeleton&lt;br&gt;Muscles&lt;br&gt;Skin</td>
<td>Minerals in Bone&lt;br&gt;Phototropism and Gravitropism&lt;br&gt;Skin Color</td>
</tr>
<tr>
<td><strong>MODULE 12</strong>&lt;br&gt;Energy and Life</td>
<td>2 WEEKS</td>
<td>Life’s energy cycle&lt;br&gt;Energy and the body&lt;br&gt;Calories and food&lt;br&gt;Metabolic rates&lt;br&gt;Combustion in living organisms</td>
<td>What Combustion Needs&lt;br&gt;The Products of Combustion&lt;br&gt;Body Temperature</td>
</tr>
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<tr>
<td><strong>MODULE 13</strong>&lt;br&gt;The Human Digestive System</td>
<td>2 WEEKS&lt;br&gt;An overview of the structures of the human digestive system and the process of digestion in our bodies.</td>
<td>• Digestion process&lt;br&gt;• Human digestive system&lt;br&gt;• Mouth, pharynx, esophagus, stomach, small intestine, liver, pancreas, and gall bladder&lt;br&gt;• Micronutrients</td>
<td>• Seeing a Part of the Digestive Process&lt;br&gt;• Stomach Acid and Antacids&lt;br&gt;• The Effect of Sodium Bicarbonate and Stomach Acid</td>
</tr>
<tr>
<td><strong>MODULE 14</strong>&lt;br&gt;The Human Circulatory and Respiratory Systems</td>
<td>2 WEEKS&lt;br&gt;An overview of the structures of the human circulatory and respiratory systems and their partnership in the body.</td>
<td>• Human circulatory system&lt;br&gt;• Heart and blood flow&lt;br&gt;• Blood components&lt;br&gt;• Lungs&lt;br&gt;• Respiratory system&lt;br&gt;• Circulation and respiration in Creation</td>
<td>• Measuring Your Own Cardiac Cycle&lt;br&gt;• The Vital Capacity of Your Lungs&lt;br&gt;• A Model of Your Lungs&lt;br&gt;• A Model of Your Vocal Cords&lt;br&gt;• Xylem</td>
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<tr>
<td><strong>MODULE 15</strong>&lt;br&gt;The Human Lymphatic, Endocrine, and Urinary Systems</td>
<td>2 WEEKS&lt;br&gt;An overview of the structures of the human lymphatic, endocrine and urinary systems and their processes in the body.</td>
<td>• Lymphatic system&lt;br&gt;• Urinary system&lt;br&gt;• Endocrine system</td>
<td>• Working Your Lacrimal Glands Too Hard&lt;br&gt;• A Model of Kidney Function</td>
</tr>
<tr>
<td><strong>MODULE 16</strong>&lt;br&gt;The Human Nervous System</td>
<td>2 WEEKS&lt;br&gt;An overview of the structures of the human nervous system and their processes in the body. Included is a study of the 5 senses in the body.</td>
<td>• Neurons&lt;br&gt;• Human nervous system&lt;br&gt;• Brain&lt;br&gt;• Peripheral nervous system&lt;br&gt;• Senses: taste, smell, vision, touch, hearing</td>
<td>• Determining a Person’s Dominant Side&lt;br&gt;• The Pupil of the Eye&lt;br&gt;• The Sense of Smell and the Sense of Taste&lt;br&gt;• The Human Blind Spot&lt;br&gt;• Variation in Touch Sensitivity</td>
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**ADDITIONAL INFORMATION:** This text also includes a Study Guide at the end of each module which serves to guide a student in studying for the provided module tests. An additional study tool in the text is the Module Summary for each module. These are a summary of each of the modules which has missing information for a student to search for in the text and complete. Answers for the Study Guides, Module Summaries and the Tests are provided for the instructor. Also available for more advanced studies are a CD that relates to what is being learned and the Apologia website which provides links to additional websites for the further exploration of the topics in the text.
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<tr>
<td><strong>MODULE 1</strong>&lt;br&gt;The Basics</td>
<td>2 WEEKS&lt;br&gt;An introduction into the basics of atoms and molecules. Putting into place the mathematical foundations for working with measurement systems and the units associated with them.</td>
<td>• Atoms and molecules&lt;br&gt;• The Metric system&lt;br&gt;• The English system&lt;br&gt;• Unit conversions&lt;br&gt;• Concentration</td>
<td>• Atoms and Molecules&lt;br&gt;• Cubits and Fingers&lt;br&gt;• Concentration</td>
</tr>
<tr>
<td><strong>MODULE 2</strong>&lt;br&gt;Air</td>
<td>2 WEEKS&lt;br&gt;An introduction to the earth’s air and its composition. Current event topics such as global warming, ozone and air pollution are also addressed.</td>
<td>• Gas composition of air (focus on oxygen, carbon dioxide)&lt;br&gt;• Global warming&lt;br&gt;• Ozone&lt;br&gt;• Air pollution</td>
<td>• Evaporation and Temperature&lt;br&gt;• Oxygen and Fire&lt;br&gt;• Carbon Dioxide and the Greenhouse Effect</td>
</tr>
<tr>
<td><strong>MODULE 3</strong>&lt;br&gt;The Atmosphere</td>
<td>2 WEEKS&lt;br&gt;The study of earth’s atmosphere and it’s many layers. Including a detailed overview of the actions taking place in each layer.</td>
<td>• Atmospheric pressure&lt;br&gt;• Layers of the earth’s atmosphere&lt;br&gt;• Temperature&lt;br&gt;• Layer’s outside earth’s atmosphere</td>
<td>• Atmospheric Pressure&lt;br&gt;• Seeing the Effect of Changing Temperature</td>
</tr>
<tr>
<td><strong>MODULE 4</strong>&lt;br&gt;The Wonder of Water</td>
<td>2 WEEKS&lt;br&gt;The study of water’s composition and its amazing properties making it such a unique and vital substance on our earth.</td>
<td>• Water composition&lt;br&gt;• Chemical formulas&lt;br&gt;• Hydrogen bonding&lt;br&gt;• Molecular forces in water</td>
<td>• The Chemical Composition of Water&lt;br&gt;• Water’s Polarity&lt;br&gt;• Solvents and Solutes&lt;br&gt;• Solid Water/Solid Butter Comparing&lt;br&gt;• Water’s Cohesion&lt;br&gt;• The Forces Between Molecules</td>
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### Module & Major Themes

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<td><strong>MODULE 5</strong></td>
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</tbody>
</table>
| The Hydrosphere       | 2 WEEKS          | • Parts of the hydrosphere  
• The hydrologic cycle  
• The ocean  
• Glaciers and icebergs  
• Groundwater and soil moisture  
• Surface water  
• Atmospheric moisture  
• Water pollution | • Evaporation,  
Condensation,  
Precipitation  
• Ice and Salt  
• Cloud Formation |
| **MODULE 6**          |                  |             |                        |
| Earth and the Lithosphere | 2 WEEKS         | • Earth’s crust, mantle and core  
• Plate tectonics  
• Earthquakes  
• Mountains and volcanoes | • How Sound Travels Through Different Substances  
• A Simulation of Plastic Rock  
• Making an Electromagnet  
• A Model of Plate Tectonics |
| **MODULE 7**          |                  |             |                        |
| Factors that Affect Earth’s Weather | 2 WEEKS       | • Clouds  
• Earth’s thermal energy  
• Latitude and longitude  
• Uneven thermal energy distribution  
• Air masses | • A Long – Term Weather Experiment |
| **MODULE 8**          |                  |             |                        |
| Weather and Its Prediction | 2 WEEKS    | • Precipitation  
• Thunderstorms  
• Tornadoes and hurricanes  
• Weather maps  
• Weather prediction | • Making Your Own Lightning  
• Experimenting with Weather Prediction |
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<tr>
<td><strong>MODULE 9</strong></td>
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</tbody>
</table>
| An Introduction to the | A study of motion. Introduction to basic mathematical motion formulas, solving motion problems and the application of motion problems in real world situations. | • Speed  
• Velocity  
• Acceleration  
• Acceleration due to gravity | • The Importance of Direction  
• The Acceleration Due to Gravity is Independent of the Object Falling  
• Measuring Height With a Stopwatch |
| **MODULE 10**         |                 |             |                       |
| Newton’s Laws         |                 |             |                       |
|                       | A detailed study of Newton’s three laws of motion. Included is a large component in the study of friction as well as detailed application of the math involved with Newton’s Second Law. | • Sir Isaac Newton  
• Newton’s First Law of Motion  
• Friction  
• Newton’s Second Law of Motion  
• Static and kinetic friction  
• Newton’s Third Law of Motion | • Two Experiments Demonstrating Newton’s First Law  
• An Experiment to See How Well You Understand Newton’s First Law  
• Friction  
• Newton’s Third Law |
| **MODULE 11**         |                 |             |                       |
| The Forces in Creation |                 |             |                       |
| Part 1                | Introduction of the four fundamental forces in creation. A specific study in the gravitational force. | • Four fundamental forces of creation  
• The gravitational force  
• Force and circular motion  
• Gravitational force and our solar system  
• Theories for cause of gravitational force  
• History of our solar system | • Force and Circular Motion  
• The “Bent Space and Time” Theory of Gravity  
• The Graviton Theory of Gravity |
| **MODULE 12**         |                 |             |                       |
| The Forces in Creation |                 |             |                       |
| Part 2                | Introduction to electromagnetic force. Causes for the electromagnetic force. A study of electricity and magnetism. | • James Clerk Maxwell  
• The electromagnetic force  
• Photons  
• Electrical charges  
• Electrical circuits (current, resistance, series and parallel)  
• Magnetism | • Electrical Attraction and Repulsion  
• Making and Using an Electroscope  
• Current and Resistance |
## Scope & Sequence

### Exploring Creation with Physical Science, 2nd Edition

#### SEMESTER II: QUARTER 4

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<th>Main Themes</th>
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</table>
| MODULE 13             | 2 WEEKS          | • The structure of the atom  
                       | A study of the strong force in the atom. A detailed look at the structure of an atom and introduction to the periodic table of the elements. | • The strong force  
                       |  | • Radioactivity (dangers, decay, dating) | NONE |
| The Forces in Creation Part 3 | | | |
| MODULE 14             | 2 WEEKS          | • Waves  
                       | The study of the structure of waves and their relationship to sound in creation. Mathematical formulas and applications related to analyzing sound. | • The Speed of Sound  
                       |  | • Sound waves  
                       |  | • Wavelength and frequency  
                       |  | • Doppler effect  
                       |  | • Volume of sound | |
| Waves and Sound    | 2 WEEKS          | • Dual nature of light  
                       | The study of the makeup, characteristics and behaviors of light. Mathematical formulas and applications related to analyzing sound. A scientific look at color. | • The Law of Reflection  
                       |  | • Wavelength and frequency of light  
                       |  | • Reflection and refraction  
                       |  | • Lenses  
                       |  | • The human eye  
                       |  | • Color | |
| MODULE 15 Light    | 2 WEEKS          | • The sun  
                       | The study of the makeup, characteristics and behaviors of light. Mathematical formulas and applications related to analyzing sound. A scientific look at color. | • The Expanding Universe  
                       |  | • Nuclear energy  
                       |  | • Star classifications  
                       |  | • Measuring distances between stars  
                       |  | • Galaxies  
                       |  | • Expanding universe | |
| MODULE 16 An Introduction to Astrophysics | | | |

### ADDITIONAL INFORMATION:
This text also includes a Study Guide at the end of each module, which serves to guide a student in studying for the provided module tests. An additional study tool in the text is the Module Summary for each module. These are a summary of each of the modules containing missing information for a student to search for in the text and complete. Answers for the Study Guides, Module Summaries and the Tests are provided for the instructor. Two additional resources offered for added teacher/student support are a multi-media companion CD containing videos, word pronunciations, mathematics support, etc. specific to this course and the Apologia website providing links to additional websites for more in-depth exploration of the topics in the text.
**Module & Major Themes** | **Timeline/Summary** | **Main Themes** | **Supporting Experiments**
--- | --- | --- | ---
**MODULE 1**  
*Biology: The Study of Life* | 2 WEEKS  
The student is introduced to the characteristics that make up life, the five kingdom classification system of life, implementing the scientific method and how to use biological classification keys. Proper microscope usage is also taught. | • The four characteristics used to define life  
• The scientific method  
• Biological classification/keys  
• Kingdom classification characteristics | • Using a Biological Key  
• Introduction to the Microscope

**MODULE 2**  
*Kingdom Monera* | 2 WEEKS  
A broad overview of kingdom Monera whose primary organism is bacteria. The eating habits, reproduction methods and preventing bacterial growth are all covered. Classes under the Monera umbrella and specific types of bacteria are introduced. | • Bacteria  
• Sexual/Asexual reproduction  
• Classification  
• Specific bacteria  
• Conditions for bacterial growth | • Pond Life: Part A  
• Pond Life: Part B

**MODULE 3**  
*Kingdom Protista* | 2 WEEKS  
A broad overview of kingdom Protista is introduced. The classification and characteristics of subkingdoms protozoa and algae are discovered. Further understanding of this kingdom is introduced by looking more closely at different phylum of protozoa and algae. | • Classification  
• Subkingdom Protozoa  
• 4 phylum of Protozoa  
• Subkingdom Algae  
• 5 phylum of Algae | • Pond Life: Part C  
• Subkingdom Protozoa  
• Subkingdom Algae
### SEMESTER I: QUARTER 1, continued

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<tr>
<td><strong>MODULE 4</strong>&lt;br&gt;Kingdom Fungi</td>
<td>2 WEEKS&lt;br&gt;A broad overview of kingdom Fungi is introduced. Taught are the general characteristics, reproduction and classification of fungi. A deeper understanding of this kingdom is shared through looking at the characteristics of six phylum within this kingdom.</td>
<td>• Characteristics&lt;br&gt;• Reproduction&lt;br&gt;• Classification&lt;br&gt;• 6 phylum&lt;br&gt;• Yeast</td>
<td>• Phylum Basidiomycota&lt;br&gt;• Yeast and the Fermentation Process&lt;br&gt;• Molds</td>
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### SEMESTER I: QUARTER 2

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<tr>
<td><strong>MODULE 5</strong>&lt;br&gt;The Chemistry of Life</td>
<td>2 WEEKS&lt;br&gt;The chemistry that makes life possible is studied here. Atoms, elements, molecules and matter are learned. The complex process of photosynthesis is explored as well as some organic chemistry as students learn about carbohydrates, acids, bases, lipids, proteins and enzymes.</td>
<td>• Atoms&lt;br&gt;• Molecules&lt;br&gt;• Elements&lt;br&gt;• Changes in matter&lt;br&gt;• Organic chemistry</td>
<td>• Diffusion&lt;br&gt;• Osmosis&lt;br&gt;• The Fragility of an Enzyme</td>
</tr>
<tr>
<td><strong>MODULE 6</strong>&lt;br&gt;The Cell</td>
<td>2 WEEKS&lt;br&gt;A very complex discussion of the cell is given in this chapter. This discussion introduces the student to all of the complex parts of the cell as well as their independent and interwoven functions. To wrap up this chapter is also a technical walk through the complex process of aerobic cellular respiration.</td>
<td>• Cellular functions&lt;br&gt;• Cellular structure&lt;br&gt;• Cellular organelles and their functions&lt;br&gt;• Cellular energy&lt;br&gt;• ADP and ATP</td>
<td>• Cell Structure I&lt;br&gt;• Cell Structure II</td>
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## SEMESTER I: QUARTER 2, continued

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<tbody>
<tr>
<td><strong>MODULE 7</strong>&lt;br&gt;<em>Kingdom Fungi</em></td>
<td>2 WEEKS</td>
<td>A module dedicated to cellular reproduction and DNA. Students learn about genes, chromosomes, and DNA. They learn the intricate process of protein synthesis along with the steps that make sexual and asexual reproduction of cells possible along with the types of cells produced from these processes.</td>
<td>• Genes • Chromosomes • DNA • Protein synthesis • Mitosis • Meiosis</td>
</tr>
<tr>
<td><strong>MODULE 8</strong>&lt;br&gt;<em>Kingdom Fungi</em></td>
<td>2 WEEKS</td>
<td>History of Mendelian Genetics prepares a student to learn about the role of genetics in the study of life. With this background students then learn how to calculate the probabilities of a specific genetic traits appearing in the cross of two organisms. To wrap up this chapter genetic disorders and diseases are also covered.</td>
<td>• Gregor Mendel • Mendel’s experiments • Punnett squares • Pedigrees • Genetic traits • Genetic disorders and diseases</td>
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## SEMESTER II: QUARTER 3

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<tr>
<td><strong>MODULE 9</strong>&lt;br&gt;<em>Evolution: Part Scientific Theory, Part Unconfirmed Hypothesis</em></td>
<td>2 WEEKS</td>
<td>The history of Charles Darwin’s theory of evolution. Micro and macroevolution are compared. The remainder of the module takes a look at science’s biological facts surrounding macroevolution and the subsequent lack of supporting evidence for macroevolution in light of these facts.</td>
<td>• History of Charles Darwin • Darwin’s theory of evolution • Microevolution • Macroevolution • Using biological facts to prove/disprove evolution</td>
</tr>
</tbody>
</table>
## SEMESTER II: QUARTER 3, continued

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<tr>
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<th>Supporting Experiments</th>
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<tbody>
<tr>
<td><strong>MODULE 10</strong>&lt;br&gt;Ecology</td>
<td><strong>2 WEEKS</strong>&lt;br&gt;Ecosystems are explored in this module. Earth's physical environment is understood through being taught about the water, oxygen, carbon and nitrogen cycles.</td>
<td>• Energy and ecosystems&lt;br&gt;• Physical environment&lt;br&gt;• Water, Oxygen, Carbon, and Nitrogen cycles</td>
<td>• Carbon Dioxide and the Greenhouse Effect</td>
</tr>
<tr>
<td><strong>MODULE 11</strong>&lt;br&gt;The Invertebrates of Kingdom Animalia</td>
<td><strong>2 WEEKS</strong>&lt;br&gt;Invertabrates of kingdom Animalia are explored in this module. Many different phylum in this category are exposed and understood. An extended look at the earthworm is a hi-light of this module.</td>
<td>• Phylum Porifera, Sponges, Cnidaria, Annelida, Platyhelminthes, Nematoda, Mollusca&lt;br&gt;• Earthworm feeding habits, respiratory and circulatory systems and reproduction.</td>
<td>• Observations of the Spicules of a Sponge&lt;br&gt;• Observation of a Hydra&lt;br&gt;• Earthworm Dissection&lt;br&gt;• Observation of a Planarian</td>
</tr>
<tr>
<td><strong>MODULE 12</strong>&lt;br&gt;Phylum Arthropoda</td>
<td><strong>2 WEEKS</strong>&lt;br&gt;This is a very comprehensive look at phylum Arthropoda within kingdom Animalia. This module further explores many classes of this phylum. Some of the organism studies include the crayfish, spiders and insects.</td>
<td>• Characteristics of arthropods&lt;br&gt;• Classes Crustacea, Arachnida, Chilopoda, Diplopoda, and Insecta&lt;br&gt;• Crayfish's respiratory, circulatory, digestive, nervous and reproductive system&lt;br&gt;• A few orders in Insecta</td>
<td>• Crayfish Dissection&lt;br&gt;• Insect Classification</td>
</tr>
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## SEMESTER II: QUARTER 4

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<tr>
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<tbody>
<tr>
<td><strong>MODULE 13</strong>&lt;br&gt;Phylum Chordata</td>
<td><strong>2 WEEKS</strong>&lt;br&gt;This is a very comprehensive look at phylum Chordata within kingdom Animalia. Subphylum Urochordata, Cephalochordata, and Vertebrata are explored. The final portion of this chapter takes a look at four more classes within this phylum.</td>
<td>• Explanation of a vertebrate's endoskeleton, circulatory and nervous systems, and reproduction&lt;br&gt;• Classes Agnatha, Chondrichthyes, Osteichthyes, and Amphibia</td>
<td>• Perch Dissection&lt;br&gt;• Frog Dissection</td>
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### Scope & Sequence

**Exploring Creation with Biology, 2nd Edition**

**SEMESTER II: QUARTER 4, continued**

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</table>
| **MODULE 14**  
*Kingdom Plantae: Anatomy and Classification* | 2 WEEKS  
An introductory look at kingdom Plantae is found in this module. Basic plant anatomy, leaf collection and identification, and plant classification are all explored. Additionally, a comparison between seedless and seed-making plants is studied. | *Plant anatomy*  
*Leaf structure – micro and macroscopically*  
*Leaf color*  
*Roots and stems*  
*Bryophytes* | *Leaf Collection and Identification*  
*How Anthocyanins and pH Help Determine Leaf Color*  
*Cross Sections of Roots, Stem and Leaf* |
| **MODULE 15**  
*Kingdom Plantae: Physiology and Reproduction* | 2 WEEKS  
More characteristics of kingdom Plantae are studied. Plant physiology and reproduction are introduced. | *Water in plants – absorption and transport*  
*Plant growth*  
*Plant reproduction*  
*Reproductive process in Anthophytes*  
*Seeds and fruits*  
*Germination and early growth* | *Reproduction in Anthophytes: Forming Pollen and Embryo Sacs*  
*Reproduction in Anthophytes: Pollination*  
*Reproduction in Anthophytes: Fertilization* |
| **MODULE 16**  
*Reptiles, Birds, and Mammals* | 2 WEEKS  
A further look at many classes and orders in kingdom Animalia. Some of the animals studied are reptiles, lizards, snakes, mammals and birds. | *Classes Reptilia, Aves and Mammalia*  
*Orders Rhynchocephalia, Squamata, Testudines, and Crocodilia*  
*Dinosaurs* | *Bird Embryology*  
*Bird Identification* |

**ADDITIONAL INFORMATION:** This text also includes a Study Guide at the end of each module which serves to guide a student in studying for the provided module tests. An additional study tool in the text is the Module Summary for each module. These are a summary of each of the modules which has missing information for a student to search for in the text and complete. Answers for the Study Guides, Module Summaries and the Tests are provided for the instructor. Also available for more advanced studies are a CD that relates to what is being learned and the Apologia website which provides links to additional websites for the further exploration of the topics in the text.
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<tbody>
<tr>
<td><strong>MODULE 1</strong></td>
<td>2 WEEKS</td>
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<tr>
<td>Measurement and Units</td>
<td>In this module, the student reads about matter and how to measure things in the world. Things that can be measured are mass, distance, time, and temperature. There are systems of measurement that use specific units, like the metric system or the English system of measurement.</td>
<td>Units of measure • The metric system • Unit conversions • Accuracy, precision, and significant Figures • Scientific notation • Density</td>
<td>Air Has Mass • Air Takes Up Space • Comparing Conversions to Measurements • The Density of Liquids</td>
</tr>
<tr>
<td><strong>MODULE 2</strong></td>
<td>2 WEEKS</td>
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<tr>
<td>Energy, Heat and Temperature</td>
<td>In this module, the student reads about energy. Whenever matter goes through any type of change, energy is either released or absorbed. Energy is the ability to do work. Heat is a form of energy that is transferred between two things that are different temperatures.</td>
<td>Energy and heat • The nature of a scientific law • The First Law of Thermodynamics • Units for measuring heat and energy • Calorimetry</td>
<td>Calibrating Your Thermometer • Measuring the Specific Heat of a Metal</td>
</tr>
<tr>
<td><strong>MODULE 3</strong></td>
<td>2 WEEKS</td>
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<tr>
<td>Atoms and Molecules</td>
<td>This module is about the structure of matter. The student learns the difference between atoms and molecules and that atoms are the building blocks of the elements. The elements are organized in a table called the Periodic Table, which also contains much information about the elements and how they are related to each other.</td>
<td>The Law of Mass Conservation • Elements • The periodic table of elements • Compounds • The Law of Multiple Proportions • Dalton’s Atomic Theory • Molecules • Ionic or covalent • Naming compounds</td>
<td>The Conservation of Mass • Electrical Conductivity of Compounds Dissolved in Water</td>
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</table>
### Module & Major Themes

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<td><strong>MODULE 4</strong></td>
<td><strong>2 WEEKS</strong></td>
<td>Classifying matter, Phase Changes, The Kinetic Theory of Matter, Chemical reactions and chemical equations, Balancing chemical equations</td>
<td>Separating a Mixture of Sand and Salt, Distinguishing Between Chemical and Physical Change, Condensing Steam in an Enclosed Vessel, The Kinetic Theory of Matter</td>
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<tr>
<td>Classifying Matter and Its Changes</td>
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**SEMESTER I: QUARTER 1, continued**

### Module & Major Themes

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<tr>
<td><strong>MODULE 5</strong></td>
<td><strong>2 WEEKS</strong></td>
<td>Decomposition reactions, Formation reactions, Complete combustion reactions, Incomplete combustion reactions, Molecular mass, The mole concept and using it in chemical equations</td>
<td>Measuring the Width of a Molecule</td>
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<td>Counting Molecules and Atom in Chemical Equations</td>
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**SEMESTER I: QUARTER 2**

### Module & Major Themes

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<tbody>
<tr>
<td><strong>MODULE 6</strong></td>
<td><strong>2 WEEKS</strong></td>
<td>Mole relationships in chemical equations, Limiting reactants and excess components, Volume relationships for gases in chemical equations, Mass relationships in chemical equations, Using stoichiometry, Empirical and molecular formulas</td>
<td>Limiting Reactions</td>
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<tr>
<td>Stoichiometry</td>
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**Module & Major Themes**

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<td>Mole relationships in chemical equations, Limiting reactants and excess components, Volume relationships for gases in chemical equations, Mass relationships in chemical equations, Using stoichiometry, Empirical and molecular formulas</td>
<td>Limiting Reactions</td>
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<td>Stoichiometry</td>
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<td>Supporting Experiments</td>
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<tr>
<td><strong>MODULE 7</strong></td>
<td><strong>Atomic Structure</strong></td>
<td><strong>2 WEEKS</strong></td>
<td><strong>• Electrical charge and atomic structure</strong></td>
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<td><strong>• Determining the number of protons, electrons, and neutrons in an atom</strong></td>
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<td><strong>• Isotopes and nuclear bombs</strong></td>
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<td><strong>• The nature of light and the electromagnetic spectrum</strong></td>
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<td><strong>• Frequency and energy</strong></td>
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<td><strong>• Bohr model of the atom</strong></td>
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<td></td>
<td><strong>• Quantum mechanical model of the atom</strong></td>
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<td><strong>• Electron configurations</strong></td>
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<td></td>
<td><strong>2 WEEKS</strong></td>
<td><strong>• Electrical Charge</strong></td>
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<td><strong>• How the Eye Detects Color</strong></td>
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</table>

| **MODULE 8**          | **Molecular Structure** | **2 WEEKS** | **• Electron configuration and the periodic chart** |
|                       |                       |             | **• Lewis structures** |
|                       |                       |             | **• Periodic properties: ionization potential, electronegativity, and atomic radius** |
|                       |                       |             | **NONE** |
### SEMESTER II: QUARTER 3

#### Module & Major Themes

<table>
<thead>
<tr>
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<th>Supporting Experiments</th>
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</thead>
</table>
| **MODULE 9** Polyatomic Ions and Molecular Geometry | 2 WEEKS In this module the structure of molecules is continued in greater detail. The module discusses the three-dimensional shapes of molecules and stresses the fact that they are not just flat (two-dimensional) objects. More complex ionic bonds are formed between groups of ions. These are called polyatomic ions. The student also learns how the VSEPR theory helps to determine the 3-D shape of a molecule. | • Polyatomic ions  
• The VSEPR theory and molecular geometry  
• Purely covalent and polar covalent compounds  
• Purely covalent and polar covalent bonds | • Polar Covalent Versus Purely Covalent Compounds  
• Solubility of Ionic Compounds |
| **MODULE 10** Acid/Base Chemistry       | 2 WEEKS This module gets back to learning about chemical reactions, specifically the most basic kind of chemical reaction, the acid/base reaction. The student learns that acids and bases have opposite properties and that they tend to neutralize each other when combined. Acids are proton donors and bases are proton acceptors. The student learns how to identify the acid and the base in a chemical reaction equation and about the importance of concentration – the strength of a solution. | • Acids and bases  
• The behavior of ionic compounds in aqueous solutions  
• Identifying and recognizing acids and bases in chemical reactions and from their chemical formulas  
• Molarity  
• Dilution equation  
• Using concentration in stoichiometry  
• Acid/Base titrations | • Common Household Examples of Acids and Bases  
• Acid/Base Titration |
| **MODULE 11** The Chemistry of Solutions | This module teaches more about the concept of solutions and how solutes dissolve into solvents. The student learns how to define solubility and the factors, such as pressure and temperature, which can affect solubility. | • How solutes dissolve in solvents  
• Solubility  
• Energy changes that occur when making a solution  
• Molality  
• Freezing-point depression and boiling-point elevation | • The Effect of Temperature on the Solubility of Solid Solutes  
• The Effect of Temperature on the Solubility of Gas  
• Investigation of a Solute that Releases Heat When Dissolved |
### MODULE 12
**The Gas Phase**

#### Timeline/Summary
2 WEEKS
This module teaches about chemistry as it happens in the gas phase. The student is taught the definition of pressure, an important measurement of a characteristic of a body of gas. The relationship between pressure, volume, and temperature is emphasized.

#### Main Themes
- Pressure
- Boyle’s Law
- Charles’s Law
- Combined gas law
- Ideal gases
- Dalton’s law of partial pressures
- The ideal gas law and using it in stoichiometry

#### Supporting Experiments
- Using the Ideal Gas Equation

### MODULE 13
**Thermodynamics**

#### Timeline/Summary
2 WEEKS
In this module the student learns more about how energy is transferred during chemical reactions. Almost all chemical reactions either release or absorb energy. The universe runs on energy and since energy cannot be created or destroyed it is important to know how to keep a detailed accounting of what happens to the energy in order to fully understand the world around us.

#### Main Themes
- Enthalpy and determining \( \Delta H \) of a chemical reaction
- Hess’s law
- Applying enthalpy to stoichiometry
- Energy diagrams
- Second Law of Thermodynamics
- Gibbs free energy

#### Supporting Experiments
- Determining the Change in \( H \) of a Chemical Reaction

### MODULE 14
**Kinetics**

#### Timeline/Summary
2 WEEKS
This module teaches about the rate at which a reaction happens called the study of reaction kinetics. The student learns the factors that affect the kinetics of a chemical reaction and how to represent the rate of a chemical reaction using the rate equation. Catalysts and their role in influencing the kinetics of a chemical reaction are taught.

#### Main Themes
- Reaction kinetics
- Factors that affect the kinetics of a chemical reaction
- The rate equation and rate orders
- Temperature dependence in the rate equation
- Catalysts and reaction rate

#### Supporting Experiments
- Factors That Affect Chemical Reaction Rates
- The Effect of a Catalyst on the Decomposition of Hydrogen Peroxide
## Module & Major Themes

### MODULE 15
**Chemical Equilibrium**

- In this module the student learns about the concept of chemical equilibrium: that chemical reactions can run in both directions at unequal rates until equilibrium is reached, which is the lowest energy state of the system. The student also learns how to define the equilibrium constant for a reaction and how to use the equilibrium constant to predict the progress of a reaction.

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</table>
| 2 WEEKS          | - Chemical equilibrium  
                  - The equilibrium constant  
                  - Le Chatelier’s principle including pressure and temperature  
                  - Acid/base Equilibria  
                  - The pH scale  
                  - Acid rain | - A Demonstration of Equilibrium  
                  - Temperature and Le Chatelier’s Principle |

### MODULE 16
**Reduction/Oxidation Reactions**

- This module teaches about a class of reactions called reduction/oxidation reactions. The concepts discussed are that of the oxidation number of an atom and how to determine the oxidation number, how to recognize a reduction/oxidation reaction and how the rearrangement of electrons can result in the flow of electrical current as in a battery.

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<th>Timeline/Summary</th>
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<th>Supporting Experiments</th>
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</table>
| 2 WEEKS          | - Oxidation and reduction  
                  - How batteries work  
                  - Corrosion | - Invisible Writing |

## ADDITIONAL INFORMATION:
This text also includes Review Questions at the end of each module, which serves to guide a student in studying for the provided module tests. Additional study tools are the Practice Problems and the Extra Practice Problems for each module. These are to be solved after each module and serve to give the student review and practice of the important quantitative skills just covered. These are also additional study tools for the module tests. Answers for the Review Questions, Practice Problems, Extra Practice Problems and the Tests are provided for the instructor. Available for more advanced studies are a CD that relates to what is being learned and the Apologia website providing links to additional websites for the further exploration of the topics in the text.
**Scope & Sequence**

*Exploring Creation with Physics, 2nd Edition*

**GRADE LEVEL:** 11th and/or working knowledge of Algebra 1, Geometry and basic Trigonometric functions.

**TEXT SUMMARY:** The science of physics is an attempt to explain everything that is observed in nature. This text is an overview of the advances made over the last three thousand years in that monumental task. It is designed as a college-prep physics course. Some important concepts covered are one and two-dimensional motion, Newton’s laws and their applications in nature, work and energy, electricity, magnetism, momentum, periodic motion, waves and optics. When studying and attempting to understand the details of how matter interacts in nature there is much involvement with measurements and using those measurements in mathematical equations. So this course revolves around those types of quantitative applications within the topics being taught.

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<td><strong>MODULE 1</strong></td>
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</tbody>
</table>
| *Motion in One Dimension* | 2 WEEKS | An introduction to and basic understanding of distance, displacement, speed, velocity and acceleration. | • Distance and displacement  
 • Speed and velocity  
 • Acceleration | • Measuring Average Velocity  
 • Measuring an Object’s Acceleration |
| **MODULE 2**          |                 |             |                        |
| *One-Dimensional Emotion Equations and Free Fall* | 2 WEEKS | An application of the ideas learned in Module One by analyzing situations mathematically using one-dimensional motion equations. This includes free fall. | • Relating velocity, acceleration, time, and displacement  
 • Free fall  
 • Terminal velocity | • The Acceleration Due to Gravity Is the Same for All Objects  
 • Determining a Person’s Reaction Time  
 • Factors That Affect Air Resistance |
| **MODULE 3**          |                 |             |                        |
| *Two-Dimensional Vectors* | 2 WEEKS | An introduction to the characteristics of vectors and how to apply the knowledge of vectors to two-dimensional motion graphically and analytically. | • Vectors  
 • Vector math: graphically  
 • Vector math: analytically  
 • Vector application | • Vector Components  
 • Vector Addition |
| **MODULE 4**          |                 |             |                        |
| *Motion in Two Dimensions* | 2 WEEKS | This module teaches the science of quantitatively applying two-dimensional vectors in navigation and projectile motion. | • Navigation in two dimensions  
 • Projectile motion in two dimensions  
 • Range | • The Two Dimensions of a Rubber Band’s Flight  
 • Measuring the Horizontal Speed of an Object without a Stopwatch |
### Module & Major Themes | Timeline/Summary | Main Themes | Supporting Experiments
--- | --- | --- | ---
**MODULE 5**  
Newton’s Laws | 2 WEEKS  
An introduction to Newton’s Laws of motion using an analytical approach in the horizontal and vertical directions. Included in this study is an in depth look at friction when explaining Newton’s Laws. | • Sir Isaac Newton  
• Newton’s First Law  
• Newton’s Second Law  
• Mass, weight, normal force  
• Newton’s Third Law | • Inertia  
• The Frictional Force

**MODULE 6**  
Applications of Newton’s Second Law | 2 WEEKS  
A more in-depth study of Newton’s Second Law and its application in the world around us. The focus is on the application of this law in situations where multiple forces are at play and not aligned in the horizontal or vertical directions. | • Transitional equilibrium  
• Rotational motion and torque  
• Rotational equilibrium  
• Objects on an incline | • Measuring Acceleration in an Elevator  
• What Causes Rotational Acceleration?  
• Measuring a Coefficient of Static Friction

**MODULE 7**  
Uniform Circular Motion and Gravity | 2 WEEKS  
A more in-depth analytical and quantitative look at circular motion and how it applies to gravity by learning the Law of Universal Gravitation. | • Uniform circular motion  
• Centripetal Force and centripetal acceleration  
• Gravity/Gravity and planets  
• Circular motion technology | • Uniform circular motion  
• Centripetal Force and centripetal acceleration  
• Gravity/Gravity and planets  
• Circular motion technology

**MODULE 8**  
Work and Energy | 2 WEEKS  
Defining theoretically and analytically work and energy. Added into this study of these concepts is the role that friction plays and its affect on both. | • Defining work and energy  
• Kinetic and potential energy  
• The First Law of Thermodynamics  
• Friction, work and energy  
• Energy and power | • Energy in a Pendulum  
• Estimating the Work Done by Friction
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<tr>
<td><strong>MODULE 9</strong>&lt;br&gt;Momentum</td>
<td>2 WEEKS&lt;br&gt;Defining momentum theoretically and analytically and its relationship to impulse. A detailed quantitative study of momentum conservation and angular momentum.</td>
<td>• Momentum defined&lt;br&gt;• Impulse&lt;br&gt;• The Conservation of Momentum&lt;br&gt;• Angular momentum</td>
<td>• Egg Drop&lt;br&gt;• Momentum and Energy Conservation</td>
</tr>
<tr>
<td><strong>MODULE 10</strong>&lt;br&gt;Periodic Motion</td>
<td>2 WEEKS&lt;br&gt;Learning periodic motion, studying examples of this in uniform circular motion and a detailed mathematical examination in a mass/spring system and a simple pendulum.</td>
<td>• Hooke’s Law&lt;br&gt;• Uniform circular motion&lt;br&gt;• The mass/spring system&lt;br&gt;• Potential energy in mass/spring system&lt;br&gt;• The simple pendulum</td>
<td>• Hooke’s Law&lt;br&gt;• The Characteristics of a Mass/Spring System</td>
</tr>
<tr>
<td><strong>MODULE 11</strong>&lt;br&gt;Waves</td>
<td>2 WEEKS&lt;br&gt;Theoretical and mathematical explanation of the different types of waves that have been found in nature.</td>
<td>• Waves&lt;br&gt;• Sound&lt;br&gt;• Speed of light&lt;br&gt;• Light</td>
<td>• Frequency and Volume of Sound Waves&lt;br&gt;• The Doppler Effect</td>
</tr>
<tr>
<td><strong>MODULE 12</strong>&lt;br&gt;Geometric Optics</td>
<td>2 WEEKS&lt;br&gt;Studying the behavior of light in the science known as optics. Light’s behavior is studied in context of flat/spherical mirrors and converging/diverging lenses. Ray tracing is heavily used here.</td>
<td>• The Law of Reflection&lt;br&gt;• Flat/Spherical mirrors&lt;br&gt;• Ray tracing&lt;br&gt;• Snell’s Law of Refraction&lt;br&gt;• Converging/Diverging lenses</td>
<td>• The Law of Reflection&lt;br&gt;• Real and Virtual Images in a Concave Mirror&lt;br&gt;• Measuring the Index of Refraction of Glass</td>
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## Scope & Sequence

**Exploring Creation with Physics, 2nd Edition**

### SEMESTER II: QUARTER 4

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<tr>
<td><strong>MODULE 13</strong>&lt;br&gt;Coulomb's Law and the Electric Field</td>
<td><strong>2 WEEKS</strong>&lt;br&gt;An introduction to electrostatics. This study starts with an understanding of the basic electric charge and building into the more complex analytical analysis of the forces between electrical charges and electric field calculations.</td>
<td>• The basics of electric charge&lt;br&gt;• Electrostatic force/Coulomb's Law&lt;br&gt;• The electric field&lt;br&gt;• Electric field calculations&lt;br&gt;• Coulomb's Law applied to atom</td>
<td>• Attraction and Repulsion&lt;br&gt;• Making and Using an Electroscope</td>
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<td><strong>MODULE 14</strong>&lt;br&gt;Electric Potential</td>
<td><strong>2 WEEKS</strong>&lt;br&gt;A study in defining electrical potential and how it relates to potential energy and potential difference. Electrical potential is further studied through its application in capacitors and TVs.</td>
<td>• Electric potential, potential energy, and potential difference&lt;br&gt;• Conservation of energy in an electrical potential&lt;br&gt;• Capacitors&lt;br&gt;• A television's picture</td>
<td>• Making a Parallel-Plate Capacitor and Storing Charge</td>
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<td><strong>MODULE 15</strong>&lt;br&gt;Electric Circuits</td>
<td><strong>2 WEEKS</strong>&lt;br&gt;This is the study of harnessing the kinetic energy of freely moving charges in the confines of an electric circuit. Included is an overview of different types of circuit design and the mathematics involved in analyzing a circuit.</td>
<td>• Batteries, circuits, and conventional current&lt;br&gt;• Resistance&lt;br&gt;• Electric heaters/power&lt;br&gt;• Series and parallel circuits&lt;br&gt;• Current and power in circuits</td>
<td>• Current and Resistance&lt;br&gt;• Building a Simple Circuit to Turn on a Light Bulb&lt;br&gt;• Series and Parallel Resistors</td>
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<td><strong>MODULE 16</strong>&lt;br&gt;Magnetism</td>
<td><strong>2 WEEKS</strong>&lt;br&gt;A study of magnetism including how a magnet becomes magnetic, what magnetic fields look like, and the use of magnets for producing electricity.</td>
<td>• Permanent magnets&lt;br&gt;• Magnetic fields&lt;br&gt;• How magnets become magnetic&lt;br&gt;• Earth’s magnetic field&lt;br&gt;• Faraday’s Law of Electromagnetic induction&lt;br&gt;• Alternating current</td>
<td>• Oersted’s Experiment&lt;br&gt;• Diamagnetic, Paramagnetic, and Ferromagnetic Compounds</td>
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### ADDITIONAL INFORMATION:

This text also includes Review Questions at the end of each module, which serves to guide a student in studying for the provided module tests. Additional study tools are the Practice Problems and the Extra Practice Problems for each module. These are to be solved after each module and serve to give the student review and practice of the important quantitative skills just covered. These are also additional study tools for the module tests. Answers for the Review Questions, Practice Problems, Extra Practice Problems and the Tests are provided for the instructor. Two additional resources offered for added teacher/student support are a multi-media companion CD containing videos, word pronunciations, mathematics support, etc. specific to this course and the Apologia website providing links to additional websites for more in-depth exploration of the topics in the text.
**Module & Major Themes** | **Timeline/Summary** | **Main Themes** | **Supporting Experiments**
---|---|---|---
**MODULE 1**  
*An Organizational Overview and Some Review* | 2 WEEKS  
An introduction to terminology specific to this course accompanied with a review of some key biological concepts needed for further study of the human body. | • Anatomy terms  
• Human body organization  
• Cell structure  
• Protein synthesis  
• Cellular mitosis  
• Plasma membrane | NONE

**MODULE 2**  
*Histology: The Study of Tissues* | 2 WEEKS  
A study of the many tissues of the body. Tissues being the building blocks of the body. | • Epithelial tissues  
• Glandular epithelium  
• Connective tissues  
• Cartilage  
• Bone and blood | • Microscope: Looking at Epithelial Tissues  
• Microscopic Anatomy of the Salivary Glands

**MODULE 3**  
*Skin and Bones – The Integumentary and Skeletal Systems* | 2 WEEKS  
A study of the integumentary system more commonly known as the skin. A study of the gross anatomy of the skeletal system. | • Basic structure of skin  
• Hair and nails  
• Skin glands  
• Skeletal system  
• Details of the appendicular skeleton  
• Details of the axial skeleton | • Microscope: A Closer Look at the Skin  
• Microscope: Details of the Hair Follicle

**MODULE 4**  
*Skeletal System Histology and Movement* | 2 WEEKS  
A study of the histology of bone tissue and joints in the human body. | • Bone histology  
• Cancellous and compact bone  
• Bone growth and remodeling  
• Major joints  
• Movement and motion | • Calcium Salts in Bone  
• Microscope: Cancellous and Compact Bone Histology
# Module & Major Themes

<table>
<thead>
<tr>
<th>Module &amp; Major Themes</th>
<th>Timeline/Summary</th>
<th>Main Themes</th>
<th>Supporting Experiments</th>
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</table>
| **MODULE 5**<br> Muscle Histology and Physiology | **2 WEEKS**<br>A study of the physiology of muscle tissues and their histology. | • Skeletal muscle structure  
• Muscle fiber contraction and relaxation  
• Neuromuscular junction  
• Motor units  
• Skeletal muscle fiber energy | • Microscope: Skeletal Muscle Histology |
| **MODULE 6**<br> Histology: The Study of Tissues | **2 WEEKS**<br>A study on how the individu-al muscles of the body come together to form the human skeletal system. | • Overview of skeletal muscle system  
• Muscle names  
• Major muscles of the head, face, chest, abdominal wall, shoulder, back, arm, hand, thigh, leg and foot | NONE |
| **MODULE 7**<br> Skin and Bones – The Integumentary and Skeletal Systems | **2 WEEKS**<br>A study of the entire nervous system including a look at the central and peripheral nervous systems. | • Cellular level of nervous system  
• Neuroglia  
• Action potentials  
• Synaptic Transmission  
• Neuron arrangements | • Microscope: Neurons and Neuroglia |
| **MODULE 8**<br> The Central Nervous System | **2 WEEKS**<br>A more detailed look at the central nervous system. An in depth look at the brain. | • Brain anatomy  
• Cerebrum in detail  
• Important brain structures  
• Brain protection  
• Spinal cord: ascending / descending pathways | NONE |
# Scope & Sequence

*The Human Body Fearfully and Wonderfully Made!*

## SEMESTER II: QUARTER 3

<table>
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</table>
| MODULE 9  
The Peripheral Nervous System | 2 WEEKS A more detailed look at the peripheral nervous system and the senses. | • Divisions and control of the autonomic nervous system  
• General senses  
• Sense of smell, taste balance, hearing and vision | • Two-Point discrimination  
• Cow Eye Dissection |
| MODULE 10  
The Endocrine System    | 2 WEEKS A study of the endocrine system and it’s extreme importance in the functioning of the human body. | • Endocrine system as a whole  
• Endocrine glands and hormones  
• Hormone chemistry, secretion and receptors  
• Prostaglandins | NONE |
| MODULE 11  
The Circulatory System | 2 WEEKS Studying the circulatory system in detail. | • Makeup of blood  
• Blood types  
• Blood circulation  
• Heart anatomy/blood flow  
• Cardiac muscle/cycle  
• Blood vessels and entire system | • Microscope: Examining a Blood Smear  
• Determining Your Blood Type  
• Cow’s Heart Dissection |
| MODULE 12  
The Central Nervous System | 2 WEEKS A study of the vast network of vessels running through the entire body that makes up the lymphatic system. | • Lymph and lymph vessels  
• Lymphatic system functions  
• Lymph tissue, nodules and nodes  
• Spleen and thymus gland  
• Immunity | • Microscope: Histology of a Tonsil |
## Scope & Sequence

The Human Body Fearfully and Wonderfully Made!

### SEMESTER II: QUARTER 4

<table>
<thead>
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<tr>
<td><strong>MODULE 13</strong>&lt;br&gt;The Digestive System</td>
<td><strong>2 WEEKS</strong>&lt;br&gt;A study of the digestive system and how nutrients get carried to the tissues of the body.</td>
<td>• Mouth, pharynx and esophagus&lt;br&gt;• Stomach&lt;br&gt;• Small and large intestines&lt;br&gt;• Liver, pancreas and gall bladder&lt;br&gt;• Nutrition</td>
<td>• Microscope: Histology of the Stomach&lt;br&gt;• Microscope: Histology of the Liver</td>
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<tr>
<td><strong>MODULE 14</strong>&lt;br&gt;The Respiratory System</td>
<td><strong>2 WEEKS</strong>&lt;br&gt;The study of the respiratory system and how it provides your tissues of the body with oxygen.</td>
<td>• Anatomy and functions of respiratory system&lt;br&gt;• Ventilation&lt;br&gt;• Gas exchange in respiration&lt;br&gt;• Cellular respiration</td>
<td>• Microscope: Histology of the Lung</td>
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<tr>
<td><strong>MODULE 15</strong>&lt;br&gt;The Urinary System</td>
<td><strong>2 WEEKS</strong>&lt;br&gt;A study of the urinary system as the main excretion system of the body.</td>
<td>• Anatomy of urinary system&lt;br&gt;• Urine formation&lt;br&gt;• Storage and release of urine&lt;br&gt;• Kidneys&lt;br&gt;• Acid/base balance in body</td>
<td>• The Bicarbonate Buffer</td>
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<tr>
<td><strong>MODULE 16</strong>&lt;br&gt;The Reproductive System</td>
<td><strong>2 WEEKS</strong>&lt;br&gt;A study of sexual reproduction allowing for the mixing of genes from two organisms.</td>
<td>• Male reproductive system anatomy&lt;br&gt;• Spermatogenesis&lt;br&gt;• Hormones/male reproduction&lt;br&gt;• Female reproductive system anatomy&lt;br&gt;• Ovum development&lt;br&gt;• Menstrual cycle</td>
<td>• Microscope: Spermatogenesis and Sperm&lt;br&gt;• The Fetal Pig Dissection</td>
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**ADDITIONAL INFORMATION:** This text also includes a Study Guide at the end of each module which serves to guide a student in studying for the provided module tests. Answers for the Study Guides and the Tests are provided for the instructor. An additional study tool available as a companion with the text is “The Anatomy Coloring Book”. It contains detailed drawings of all the anatomy that the student needs to learn in this course and more. As the student colors the pictures, this process serves as a review. Apologia also offers the pre-made slides and dissection specimens and supplies needed for this course.