Science & Technology

From Molecules to Organisms: Structures & Processes

Ecosystem: Interactions, Energy, & Dynamics

| Science, Engineering, and Technology Vocabulary | Note: These terms should be introduced to students at the beginning of the year and retaught on an ongoing basis through the year: science, scientific method, scientific inquiry, observing, Inferring, predicting, classifying, evaluating, question, hypothesis, control, controlled experiment, variable, manipulated variable, responding variable, controlled experiment, data, conclusion, model, ethics, personal bias, cultural bias, experimental bias, objective, scientific theory, scientific law, data, graph, table, chart, metric system, SI, meter, kilometer, centimeter, millimeter, volume, liter, cubic centimeter, milliliter, mass, weight, meniscus, density, gram, kilogram, milligram, controlled experiment, test tube, graduated cylinder, beaker, balance scale, stopwatch, microscope, estimate, safety symbol |
| Chapter 1 Vocabulary (1.1 - 1.4) | Section 1.1: organism, cell, unicellular, multicellular, metabolism, stimulus, response, development, asexual reproduction, sexual reproduction, spontaneous generation, controlled experiment, autotroph, heterotroph, homeostasis
Section 1.2: classification, taxonomy, binomial nomenclature, genus, species
Section 1.3: prokaryote, eukaryote, nucleus
Section 1.4: evolution, branching tree diagram, shared derived characteristic, convergent evolution |
| Chapter 2 Vocabulary (2.1 - 2.4) | Section 2.1: cell, microscope, cell theory, Hooke, Leeuwenhoek, Schleiden, Schwann, Virchow
Section 2.2: cell wall, cell membrane, nucleus, organelle, ribosome, cytoplasm, mitochondria, endoplasmic reticulum, Golgi apparatus, vacuole, chloroplast, lysosome, multicellular, unicellular, tissue, organ, organ system |
<table>
<thead>
<tr>
<th>Section 2.3:</th>
<th>element, compound, carbohydrate, lipid, protein, enzyme, nucleic acid, DNA, double helix</th>
</tr>
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<tbody>
<tr>
<td>Section 2.4:</td>
<td>selectively permeable, passive transport, diffusion, osmosis, active transport, endocytosis, exocytosis</td>
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**Chapter 3 Vocabulary (3.1 - 3.3)**

<table>
<thead>
<tr>
<th>Section 3.1:</th>
<th>food chain, food web, photosynthesis, autotroph, heterotroph, chlorophyll</th>
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<tbody>
<tr>
<td>Section 3.2:</td>
<td>cellular respiration, fermentation</td>
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<tr>
<td>Section 3.3:</td>
<td>cell cycle, interphase, replication, chromosome, mitosis, cytokinesis</td>
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</tbody>
</table>
# Huntsville City Schools
## Pacing Guide 2017 – 2018
### Course: Life Science Grade 7
#### First Nine Weeks

<table>
<thead>
<tr>
<th>Standard</th>
<th>Resources</th>
<th>Approximate Pacing Number of Days</th>
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</thead>
</table>
Chapter 1 What is Science  
Chapter 3 The Tools of Science  
Appendix A Safety Symbols  
Appendix B Using a Laboratory Balance  
Performance Assessment Chapter 3 A Graph Shows A Trend  
LTF: Penny Lab: Scientific Method  
LTF: Foundation lesson 9: Essay Writing Skill | 5 days |
| 2. Gather and synthesize information to explain how prokaryotic and eukaryotic cells differ in structure and function, including the methods of asexual and sexual reproduction. | Chapter 1.1 What Is Life  
Chapter 1.2 Classifying Life  
Chapter 1.3 Domains and Kingdoms  
Chapter 1.4 Evolution and Classification  
A.M.S.T.I. (1st Nine Weeks)  
Studying The Development and Reproduction of Organisms | 7 days |
| 1. Engage in argument from evidence to support claims of the cell theory. | Chapter 2.1 Discovering Cells  
LTF: Cell Factory | 3 days |
| 3. Construct an explanation of the function (e.g., mitochondria releasing energy during cellular respiration) of | Chapter 2.2 Looking Inside Cells  
LTF: Is it Plant or Animal?  
LTF: Microscope Mystery  
LTF: Up Close and Personal | 10 days |
specific cell structures (i.e., nucleus, cell membrane, cell wall, ribosomes, mitochondria, chloroplasts, and vacuoles) for maintaining a stable environment.

3. Construct an explanation of the function (e.g., mitochondria releasing energy during cellular respiration) of specific cell structures (i.e., nucleus, cell membrane, cell wall, ribosomes, mitochondria, chloroplasts, and vacuoles) for maintaining a stable environment.

5. Examine the cycling of matter between abiotic and biotic parts of ecosystems to explain the flow of energy and the conservation of matter.
   a. Obtain, evaluate, and communicate information about how food is broken down through chemical reactions to create new molecules that support growth and/or release energy as it moves through an organism.
   b. Generate a scientific explanation based on evidence for the role of photosynthesis and cellular respiration in the cycling of matter and flow of energy into and out of organisms.

2. Gather and synthesize information to explain how prokaryotic and eukaryotic cells differ in structure and function, including the methods of asexual and sexual reproduction.
| COS #1, 2, 3, 5 | Review | 4 days |
Huntsville City Schools  
Pacing Guide 2017 - 2018  
Course: **Life Science Grade: 7**  
Second Nine Weeks

### Heredity: Inheritance and Variation of Traits

| Chapter 4 Vocabulary (4.1 - 4.4.) | Section 4.1: heredity, trait, genetics, fertilization, purebred, gene, allele, dominant allele, recessive allele, hybrid, Mendel  
| | Section 4.2: probability, Punnett square, phenotype, genotype, homozygous, heterozygous  
| | Section 4.3: incomplete dominance, codominance, multiple alleles, polygenic inheritance  
| | Section 4.4: meiosis, chromosome  

| Chapter 5 Vocabulary (5.1, 5.3, 5.5) | Section 5.1: nitrogen bases, DNA Replication, Watson, Crick  
| | Section 5.3: mutation, cancer, tumor, chemotherapy  
| | Section 5.5: selective breeding, inbreeding, hybridization, clone, genetic engineering, gene therapy  

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Huntsville City Schools  
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Course: **Life Science Grade: 7**  
Second Nine Weeks

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12. Construct and use models (e.g., monohybrid crosses using Punnett squares, diagrams, simulations) to explain that genetic variations between parent and offspring (e.g., different alleles, mutations) occur as a result of genetic differences in randomly inherited genes located on chromosomes and that additional variations may arise from alteration of genetic information.

<table>
<thead>
<tr>
<th>Chapter 4.1 What is Heredity</th>
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<tr>
<td>Chapter 4.2 Probability and Heredity</td>
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<tr>
<td>Chapter 4.3 Patterns of Inheritance</td>
</tr>
<tr>
<td>Chapter 4.4 Chromosomes and Inheritance</td>
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<tr>
<td>Science Spot: Sponge Bob Genetics</td>
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<tr>
<td>Meiosis Square Dance</td>
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<tr>
<td>Meiosis Square Dance Video Link</td>
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Genetics Online Scavenger Hunt: [Genetics Scavenger Hunt Link](#)
PhET Lab Simulation: Gene Expressions- The Basics
LTF: Punnett Square Exercises
LTF: Gene Interactions
LTF: Thumbs up
LTF: Yellow Mice
AMSTI SDRO: Next Generation
Hudson Alpha Genetics Kit
**Honors:** LTF: “Gene Interactions”
**Honors:** Genetic Disorders Brochure
**Honors:** Family Tree Project
**Honors:** STEMQuest - Funky Fruit Quest (Pearson Realize Platform)

Chapter 5.1 The Genetic Code

Hudson Alpha Genetics Kit
PhET Lab Simulation: Stretching DNA
**Honors:** DNA Model Project: Students build a 3-D model of DNA

13. Construct an explanation from evidence to describe how genetic mutations result in harmful, beneficial, or neutral effects to the structure and function of an organism.

<table>
<thead>
<tr>
<th>Chapter 5.3 Mutations</th>
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Alien Encounters: [https://nevelbiology.files.wordpress.com/2012/01/13-alienencountersstudent.pdf](https://nevelbiology.files.wordpress.com/2012/01/13-alienencountersstudent.pdf)
LTF: Going Bananas for DNA
Hudson Alpha Genetics Kit - Strawberry DNA | 8 days |
14. Gather and synthesize information regarding the impact of technologies (e.g., hand pollination, selective breeding, genetic engineering, genetic modification, gene therapy) on the inheritance and/or appearance of desired traits in organisms.

<table>
<thead>
<tr>
<th>COS #12, 13, 14</th>
<th>Review</th>
<th>3 days</th>
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**Chapter 5.5 Advances in Genetics**
Hudson Alpha Genetics Kit
Hudson Alpha Genetics Kit Link

3 days
| Chapter 9 Vocabulary (9.1 - 9.5) | Section 9.1: cell, cell membrane, nucleus, cytoplasm, tissue, muscle tissue, nervous tissue, connective tissue, epithelial tissue, organ, organ system  
Section 9.2: skeleton, skeletal muscle, joint, nutrient, absorption, gland, stimulus, response, hormone  
Section 9.3: homeostasis, stress  
Section 9.4: skeleton, vertebrae, joint, ligament, compact bone, spongy bone, marrow, cartilage, osteoporosis, hinge joint, ball-and-socket joint, gliding joint, pivot joint  
Section 9.5: involuntary muscle, voluntary muscle, skeletal muscle, tendon, smooth muscle, cardiac muscle, striated muscle, flexor, extensor |
| --- | --- |
| Chapter 8.4 Vocabulary (See Pearson Interactive - Chapter 12) Will need to supplement vocabulary and information with old book and/or other materials. Very little information on the digestive, circulatory, and respiratory systems in new book. New book has all three systems together in section 8.4. | Pearson Interactive (Old Platform)  
Section 12.1: calorie, enzyme, mechanical digestion, chemical digestion, mouth, saliva, esophagus, peristalsis, stomach, pancreas, small intestine, liver, bile, gallbladder, large intestine, villi, epiglottis, rectum  
Section 12.2: circulatory system (cardiovascular system), heart, atrium, ventricle, valve, artery, aorta, capillary, vein, hemoglobin, red blood cells, white blood cells, platelets, plasma, systemic circulation, pulmonary circulation  
Section 12.3: pharynx, trachea, cilia, bronchi, lungs, alveoli, diaphragm, larynx, vocal cords |
| Chapter 10 Vocabulary (10.1, 10.3) | Section 10.1: neuron, nerve impulse, nerve, synapse, central nervous system, peripheral nervous system, reflex, brain, cerebrum, cerebellum, medulla, spinal cord  
Section 10.3: fertilization, egg, sperm, zygote, testes, testosterone, scrotum, semen, penis, ovary, estrogen, fallopian tube, uterus, vagina, menstrual cycle, menstruation, ovulation |
# Huntsville City Schools
## Pacing Guide 2017 - 2018
### Course: Life Science Grade: 7
#### Third Nine Weeks

<table>
<thead>
<tr>
<th>Standard</th>
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</table>
| 4. Construct models and representations of organ systems (e.g.,        | **Chapter 9.1 Body Organization**  
Body Systems Flipbook  
Introduction to the Human Body – Amoeba Sisters: [Amoeba Sisters Handout Link](http://www.amoebasisters.com/handouts.html)  
LTF: Life-Size Scaling  
Science Spot: Human Body Quest Research Project  
**A.M.S.T.I. Investigating Digestion and Motion (2nd Nine Weeks)**  
**Honors:** STEMQuest - Peak Performance Plan (Pearson Realize Platform) | 3 days |
| circulatory, digestive, respiratory, muscular, skeletal, nervous) to  |                                                                                     |                                   |
| demonstrate how multiple interacting organs and systems work together  |                                                                                     |                                   |
| to accomplish specific functions.                                       |                                                                                     |                                   |
|                                                                        | **Chapter 9.2 System Interactions**  
**Chapter 9.3 Homeostasis**  
Homeostasis – Amoeba Sisters: [http://www.amoebasisters.com/handouts.html](http://www.amoebasisters.com/handouts.html) | 3 days |
|                                                                        |                                                                                     |                                   |
| 4. Construct models and representations of organ systems (e.g.,        | **Chapter 9.4 The Skeletal System**  
Dem Bones Activity  
Virtual Hip Replacement – Ed Heads  
LTF: Levers R Us | 4 days |
| circulatory, digestive, respiratory, muscular, skeletal, nervous) to  |                                                                                     |                                   |
| demonstrate how multiple interacting organs and systems work together  |                                                                                     |                                   |
| to accomplish specific functions.                                       |                                                                                     |                                   |
| 4. Construct models and representations of organ systems (e.g., circulatory, digestive, respiratory, muscular, skeletal, nervous) to demonstrate how multiple interacting organs and systems work together to accomplish specific functions. | **Chapter 9.5 The Muscular System**
**Muscular System Diagram Link**

*Change quarters on website for resources for other units on the body systems.* | 4 days |
|---|---|---|
| 4. Construct models and representations of organ systems (e.g., circulatory, digestive, respiratory, muscular, skeletal, nervous) to demonstrate how multiple interacting organs and systems work together to accomplish specific functions. | **Pearson Interactive 12.1 Digestion**
LTF: Antacid Analysis
LTF: Chew on This
**Digestive System Link** | 4 days |
| 4. Construct models and representations of organ systems (e.g., circulatory, digestive, respiratory, muscular, skeletal, nervous) to demonstrate how multiple interacting organs and systems work together to accomplish specific functions. | **Pearson Interactive 12.2 Circulatory System**
LTF: A Fishy Tale
LTF: How Does Your Heart Rate | 4 days |
| 4. Construct models and representations of organ systems (e.g., circulatory, digestive, respiratory, muscular, skeletal, nervous) to demonstrate how multiple interacting organs and systems work together to accomplish specific functions. | **Pearson Interactive 12.3 Respiratory System** | 4 days |
| 4. Construct models and representations of organ systems (e.g., circulatory, digestive, respiratory, muscular, skeletal, nervous) to demonstrate how multiple interacting organs and systems work together to accomplish specific functions. | **Chapter 10.1 The Nervous System**
LTF: Popcorn Dice & Everything Nice
PhET Lab Simulation: Neuron | 3 days |
muscular, skeletal, nervous) to demonstrate how multiple interacting organs and systems work together to accomplish specific functions.

| 4. Construct models and representations of organ systems (e.g., circulatory, digestive, respiratory, muscular, skeletal, nervous) to demonstrate how multiple interacting organs and systems work together to accomplish specific functions. | **Chapter 10.3 The Male and Female Reproductive Systems** | 3 days |

| COS #4 | **Review** | 3 days |

Human Body Corporation Letter: Select an organ and convince your “boss” why you are important for the function of the corporation and should keep your job; Name the organ, the organ system you belong to, your function in the system and organization, and which organs you work well with.

Make A Frog Sandwich

**Honors:** Frog Dissection
# Huntsville City Schools
## Pacing Guide 2017 - 2018
### Course: Life Science Grade: 7
### Fourth Nine Weeks

**Ecosystems: Interactions, Energy, & Dynamics**

**Unity & Diversity**

| Chapter 11 Vocabulary (11.2 - 11.3) | Section 11.1: organism, habitat, biotic factor, abiotic factor, species, population, community, ecosystem, ecology
|  | Section 11.2: birth rate, death rate, immigration, emigration, population density, limiting factor, carrying capacity
|  | Section 11.3: natural selection, adaptation, niche, competition, predation, predator, prey, symbiosis, parasitism, mutualism, commensalism, parasite, host

| Chapter 12 Vocabulary (12.1, 12.2, 12.4) | Section 12.1: producer, consumer, herbivore, carnivore, omnivore, scavenger, decomposer, food chain, food web, energy pyramid, desertification
|  | Section 12.2: evaporation, condensation, precipitation, nitrogen fixation
|  | Section 12.4: estuary, intertidal zone, neritic zone

| Chapter 7 Vocabulary (7.5) | Section 7.5: tropism, hormone, auxin, photoperiodism, critical night length, short-day plant, long-day plant, day-neutral plant, dormancy

| Chapter 13 Vocabulary (13.1, 13.3, 13.4) | Section 13.1: succession, primary succession, pioneer species, secondary succession
|  | Section 13.3: biodiversity, keystone species, gene, extinction, endangered species, threatened species, habitat destruction, habitat fragmentation, poaching, captive breeding
|  | Section 13.4: biogeography, continental drift, dispersal, exotic species

| Chapter 6 Vocabulary (6.3 & 6.4) | Section 6.3: species, fossil, adaptation, evolution, natural selection, habitat, variation
|  | Section 6.4: homologous structures
<table>
<thead>
<tr>
<th>Standard</th>
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</table>
| 5. Examine the cycling of matter between abiotic and biotic parts of ecosystems to explain the flow of energy and the conservation of matter.  
   a. Obtain, evaluate, and communicate information about how food is broken down through chemical reactions to create new molecules that support growth and/or release energy as it moves through an organism.  
   b. Generate a scientific explanation based on evidence for the role of photosynthesis and cellular respiration in the cycling of matter and flow of energy into and out of organisms. | Chapter 11.1 Living Things and the Environment  
Chapter 11.2 Populations  
Natural Selection and Evolution Lab with Teddy Grahams (Populations)  
**Honors:** STEMQuest - To Cross or Not to Cross (Pearson Realize Platform) | 5 days |
8. Construct an explanation to predict patterns of interactions in different ecosystems in terms of the relationships between and among organisms (e.g., competition, predation, mutualism, commensalism, parasitism).

10. Use evidence and scientific reasoning to explain how characteristic animal behaviors (e.g., building nests to protect young from cold, herding to protect young from predators, attracting mates for breeding by producing special sounds and displaying colorful plumage, transferring pollen or seeds to create conditions for seed germination and growth) and specialized plant structures (e.g., flower brightness, nectar, and odor attracting birds that transfer pollen; hard outer shells on seeds providing protection prior to germination) affect the probability of successful reproduction of both animals and plants.

18. Construct an explanation from evidence that natural selection acting over generations may lead to the predominance of certain traits that support successful survival and reproduction of a population.
5. Examine the cycling of matter between abiotic and biotic parts of ecosystems to explain the flow of energy and the conservation of matter.
   a. Obtain, evaluate, and communicate information about how food is broken down through chemical reactions to create new molecules that support growth and/or release energy as it moves through an organism.
   b. Generate a scientific explanation based on evidence for the role of photosynthesis and cellular respiration in the cycling of matter and flow of energy into and out of organisms.

11. Analyze and interpret data to predict how environmental conditions (e.g., weather, availability of nutrients, location) and genetic factors (e.g., selective breeding of cattle or crops) influence the growth of organisms (e.g., drought decreasing plant growth, adequate supply of nutrients for maintaining normal plant growth, identical plant seeds growing at different rates in different weather conditions, fish growing larger in large ponds than in small ponds).

7. Use empirical evidence from patterns and data to demonstrate how changes to physical or biological components of an ecosystem (e.g., deforestation, succession, drought, fire, disease, human activities, invasive species) can lead to shifts in populations.

<table>
<thead>
<tr>
<th>Chapter 12.1 Energy Flow in Ecosystems</th>
<th>5 days</th>
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</thead>
<tbody>
<tr>
<td>Chapter 12.2 Cycles of Matter</td>
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<tr>
<td>LTF: Field of Beans</td>
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<thead>
<tr>
<th>Chapter 12.4 Aquatic Ecosystems</th>
<th>6 days</th>
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</thead>
<tbody>
<tr>
<td>Honors: Bottle Biology (Aquatic Ecosystem in a Bottle)</td>
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<tr>
<td><a href="http://www.amoebasisters.com/handouts.html">Aquatic Ecosystem in a Bottle Link</a></td>
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<tr>
<td>Chapter 7.5 Plant Responses and Growth</td>
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<table>
<thead>
<tr>
<th>Chapter 13.1 Changing Ecosystems</th>
<th>3 days</th>
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9. Engage in argument to defend the effectiveness of a design solution that maintains biodiversity and ecosystem services (e.g., using scientific, economic, and social considerations regarding purifying water, recycling nutrients, preventing soil erosion).

**Chapter 13.3 Biodiversity**
*Bill Nye Video - Biodiversity (Teacher Tube)*
*Research Project: Keystone Species* (follow Differentiated Instruction p. 559)

**Chapter 13.4 Biogeography**
*LTF: Toothpick Birds*
*LTF: Tragedy in the Making*
*Pangea Project - USGS Fossil and Mountain Chain Evidence or Wegener’s Puzzling Continents*

10. Use evidence and scientific reasoning to explain how characteristic animal behaviors (e.g., building nests to protect young from cold, herding to protect young from predators, attracting mates for breeding by producing special sounds and displaying colorful plumage, transferring pollen or seeds to create conditions for seed germination and growth) and specialized plant structures (e.g., flower brightness, nectar, and odor attracting birds that transfer pollen; hard outer shells on seeds providing protection prior to germination) affect the probability of successful reproduction of both animals and plants.

**Chapter 6.3 Darwin’s Theory**
*LTF: Beak vs Food*
*LTF: Bean Bunny Evolution*

**Honors:** *LTF: Create a Species*
*Small Lab: Particle Predator*

<table>
<thead>
<tr>
<th>Chapter 13.3 Biodiversity</th>
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<tbody>
<tr>
<td><em>Bill Nye Video - Biodiversity (Teacher Tube)</em></td>
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<td><em>Research Project: Keystone Species</em> (follow Differentiated Instruction p. 559)</td>
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<th>Chapter 13.4 Biogeography</th>
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<tr>
<td><em>LTF: Toothpick Birds</em></td>
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<tr>
<td><em>Pangea Project - USGS Fossil and Mountain Chain Evidence or Wegener’s Puzzling Continents</em></td>
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<th>Chapter 6.3 Darwin’s Theory</th>
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<th><strong>Honors:</strong></th>
<th>5 days</th>
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<tr>
<td><em>LTF: Create a Species</em></td>
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<tr>
<td><em>Small Lab: Particle Predator</em></td>
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</table>
15. Analyze and interpret data for patterns of change in anatomical structures of organisms using the fossil record and the chronological order of fossil appearance in rock layers.

16. Construct an explanation based on evidence (e.g., cladogram, phylogenetic tree) for the anatomical similarities and differences among modern organisms and between modern and fossil organisms, including living fossils (e.g., alligator, horseshoe crab, nautilus, coelacanth).

17. Obtain and evaluate pictorial data to compare patterns in the embryological development across multiple species to identify relationships not evident in the adult anatomy.

<table>
<thead>
<tr>
<th>Chapter 6.4 Evidence of Evolution</th>
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<tbody>
<tr>
<td>Evidence of Evolution Lab:</td>
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<tr>
<td><a href="http://www.polk.k12.ga.us/userfiles/682/Classes/1442/Evidence%20of%20Evolution%20Lab.pdf">http://www.polk.k12.ga.us/userfiles/682/Classes/1442/Evidence%20of%20Evolution%20Lab.pdf</a></td>
</tr>
<tr>
<td>Nova Labs: Fossils: Rocking the Earth</td>
</tr>
<tr>
<td><a href="http://www.pbs.org/wgbh/nova/labs/lab/evolution/2/1/">http://www.pbs.org/wgbh/nova/labs/lab/evolution/2/1/</a></td>
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<tr>
<th>COS # 5, 6, 7, 8, 9, 10, 11, 15, 16, 17, 18</th>
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<tbody>
<tr>
<td>Objective: Identify steps in the scientific method.</td>
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<td>Review</td>
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<tr>
<th>Revisit science skills material taught throughout the year to prepare for 8th grade Physical Science</th>
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<td>3 days</td>
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Alabama Technology Course of Study

Sixth – Eighth Grade Overview

Students in Grades 6-8 possess a wide range of intellectual abilities, learning styles, talents, and interests. These students are experiencing a transitional period that includes physical, social, emotional, and intellectual changes. In addition, students are developing skills to function in a technological society.

The technology content standards for Grades 6-8 are designed to complement all areas of the academic curriculum. In a world where information increases exponentially, students are expected to develop and use critical-thinking and decision-making skills. Digital tools enhance middle school students’ emerging abilities to analyze, synthesize, and evaluate information. The integration of technology systems expands and optimizes their ability to use information and to communicate and collaborate with diverse individuals. It is critical for students at these grade levels to expand the knowledge and skills necessary for solving both hypothetical and authentic problems.

In a global world community, students are expected to be responsible digital citizens who practice safe, legal, and responsible use of technology systems and digital media. Students must comprehend the impact of technology on the cultural, social, economic, environmental, and political aspects of society. Positive attitudes toward technology use are essential to support collaboration, learning, and productivity for success in the twenty-first century.

Technology Operations and Concepts

Students will:

1. Appraise technology systems to determine software and hardware compatibility.
2. Publish digital products that communicate curriculum concepts.
   - Examples: Web pages, videos, podcasts, multimedia presentations
3. Explain how network systems are connected and used.
   Examples: file sharing, collaborating, wireless networking
4. Determine basic troubleshooting strategies to correct common hardware and software problems.
   Examples: checking connections, restarting equipment, creating a backup copy of digital data
   - Describing the importance of antivirus and security software
5. Use basic features of word processing, spreadsheets, databases, and presentation software.
   Examples: word processing—reports, letters, brochures
   spreadsheets—discovering patterns, tracking spending, creating budgets
   databases—contact list of addresses and telephone numbers
   presentation software—slideshow
Examples: spreadsheet for budgets, word processing software for essays, probes for data collection

7. Demonstrate correct keyboarding techniques.

Digital Citizenship
8. Identify safe uses of social networking and electronic communication.
   • Recognizing dangers of online predators
   • Protecting personal information online

9. Practice responsible and legal use of technology systems and digital content.
   • Examples: avoiding plagiarism; complying with acceptable-use policies, copyright laws, and fair use standards; recognizing secure Web site
   • Examples: computer crime—phishing, spoofing, virus and worm dissemination, cyberbullying penalties—fines, incarceration
   Citing sources of digital content

10. Describe advances in technology and effects of each on the workplace and society.
    • Examples: agriculture, manufacturing, medicine, warfare, transportation, communication, education

Research and Information Fluency
11. Use digital tools and strategies to locate, collect, organize, evaluate, and synthesize information.
    • Examples: locating—Boolean searches, graphic organizers, spreadsheets, databases, collecting—probeware, graphing calculators
    • Examples: graphic organizers, spreadsheets
    • Evaluating—reviewing publication dates, determining credibility
    • Synthesizing—word processing software, concept-mapping software

Communication and Collaboration
12. Use digital tools to communicate and collaborate at all levels from interpersonal to global.
    • Examples: instant messages, e-mail, blogs, wikis, collaborative authoring tools, online learning communities
    • Demonstrating digital file transfer
    • Examples: attaching, uploading, downloading

Critical Thinking, Problem Solving, and Decision Making
13. Use digital tools to formulate solutions to authentic problems.
    Examples: electronic graphing tools, probes, spreadsheets
Creativity and Innovation

14. Use digital tools to generate new ideas, products, or processes.
   - Examples: ideas—predictions, trends
     products—animation, video
     processes—models, simulations