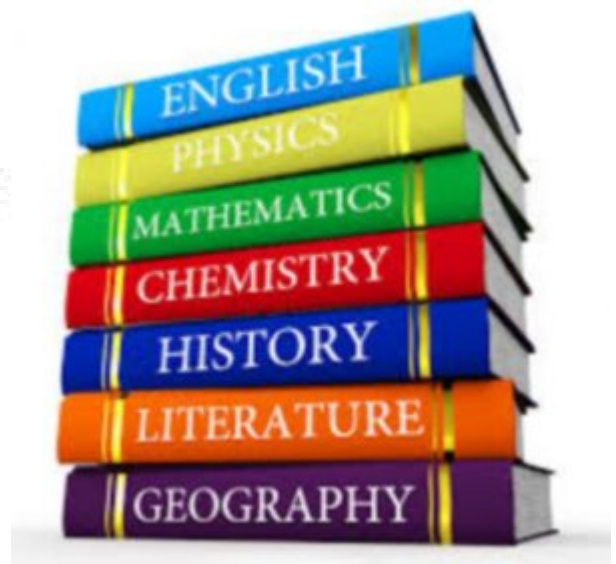


## **DeskTop Learning Solutions®**

### **MommieTeachOnline™ Homeschool Learning**



**Learning That Fits Your Child**

**Brochure & Course Outline 2018/2019 SY**

# Table of Contents

<b><u>Academic Subject</u></b>	<b><u>Page #</u></b>
<b>Reading Comprehension</b>	<b>3</b>
<b>Language Arts</b>	<b>3-5</b>
<b>Mathematics Programs</b>	<b>5-11</b>
<b>Social Sciences (Geography, History, Civics &amp; Government)</b>	<b>12-13</b>
<b>Virginia Studies</b>	<b>14-15</b>
<b>Sciences (Earth, Life, Biology, &amp; Chemistry</b>	<b>15-22</b>

## Grades 3-12 Core Curriculum



Reading is a continued priority in grades 3-7. Emphasis is placed on learning about words, reading text with fluency and expression, and learning comprehension strategies. The student will read a variety of fiction and nonfiction texts, which relate to all areas of the curriculum.

### Reading Comprehension

**The student will apply word-analysis skills when reading:**

- a) Use knowledge of regular and irregular vowel patterns.
  - b) Decode regular multi-syllabic words.
- The student will expand vocabulary when reading.
- a) Use knowledge of homophones.
  - b) Use knowledge of roots, affixes, synonyms, and antonyms.
  - c) Apply meaning clues, language structure, and phonetic strategies.
  - d) Use context to clarify meaning of unfamiliar words.
  - e) Use vocabulary from other content areas.
  - f) Use word reference resources including the glossary, dictionary, and thesaurus.



**The student will read and demonstrate comprehension of assigned reading materials:**

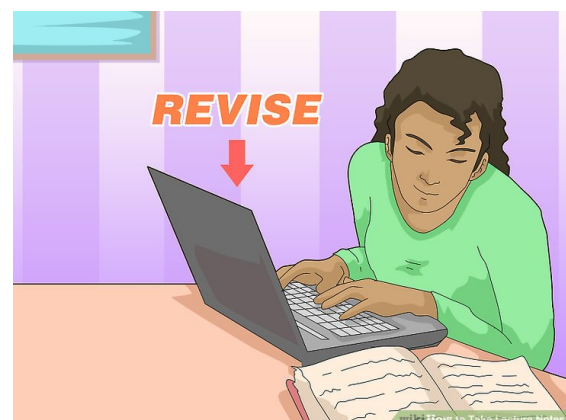
- a) Set a purpose for reading.
- b) Make connections between previous experiences and reading selections.
- c) Identify the author's purpose.
- d) Ask and answer questions about what is read.
- e) Draw conclusions about text.
- f) Identify the main idea.
- g) Identify supporting details.
- h) Use reading strategies to monitor comprehension throughout the reading process.
- i) Identify new information gained from reading.
- k) Use encyclopedias and other reference books, including online reference materials.

**Use table of contents, indices, and charts.**

### Writing & Composition

The Writing class includes daily online lessons, interactive learning activities, and writing projects. Students will use the online resources planned each week to complete assignments, guided lessons, and assessments.

**(Local Students Only)** Meet once weekly. During the weekly on-site workshop, students will work one-on-one with me on



their writing assignments and projects, with a focus on the writing process, editing, proofreading, revising drafts, and producing the final draft.

**The student will write for a variety of purposes:**

- a) Identify the intended audience.
- b) Use a variety of pre-writing strategies.
- c) Write a clear topic sentence focusing on the main idea.
- d) Learn strategies for sound paragraph development.
- e) Use strategies for organization of information and elaboration according to the type of writing.
- f) Include details that elaborate the main idea.
- g) Revise writing for clarity of content using specific vocabulary and information.

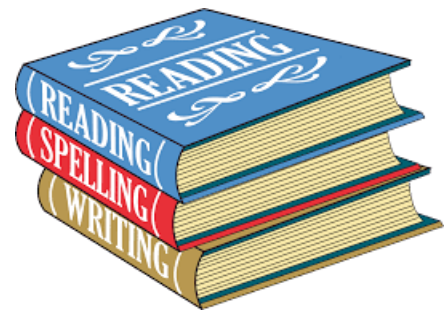
**The student will edit writing for correct grammar, capitalization, punctuation, and spelling. The student will use available technology for reading and writing:**

- a) Use complete sentences.
- b) Use transition words to vary sentence structure.
- c) Use the word I in compound subjects.
- d) Use past and present verb tense.
- e) Use singular possessives.
- f) Use commas in a simple series.
- g) Use simple abbreviations.
- h) Use apostrophes in contractions with pronouns and in possessives.
- i) Use the articles a, an, and the correctly.
- j) Include prepositional phrases.
- k) Eliminate double negatives.
- l) Use noun-pronoun agreement.
- m) Use commas in series, dates, and addresses.
- n) Incorporate adjectives and adverbs.
- o) Use correct spelling for frequently used words, including common homophones.
- p) Use singular possessives.

**Language Arts II:**

**The student will edit writing for correct grammar, capitalization, spelling, punctuation, sentence structure, and paragraphing.**

- a) Use plural possessives
- b) Use adjective and adverb comparisons.
- c) Identify and use interjections.
- d) Use apostrophes in contractions and possessives.
- e) Use quotation marks with dialogue.
- f) Use commas to indicate interrupters.
- g) Use a hyphen to divide words at the end of a line.
- h) Edit for fragments and run-on sentences.
- i) Eliminate double negatives.
- j) Use correct spelling of commonly used words.
- j) Use correct spelling for frequently used sight words,
- k) Identify and use conjunctions, including irregular plurals.



**The student will write a short report.**

- a) Construct questions about the topic.
- b) Identify appropriate resources.
- c) Collect and organize information about the topic into a short report.
- d) Understand the difference between plagiarism and using own words.

## Language Arts I



The student will edit writing for correct grammar, capitalization, spelling, punctuation, sentence structure, and paragraphing.

a) Use subject-verb agreement.

## Spelling & Vocabulary

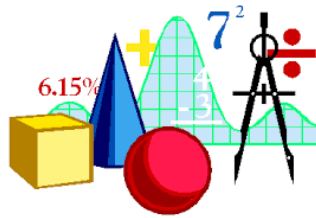
### Spelling & Vocabulary Development

The student will expand vocabulary when reading context materials, as well as through word lists and curriculum-based lessons and learning units.

- a) Use context to clarify meanings of unfamiliar words.
- b) Use knowledge of academic spelling rules, word roots, affixes, synonyms, antonyms, and homophones.
- c) Use word-reference materials, including the glossary, dictionary, and thesaurus.
- d) Develop vocabulary by listening to and reading a variety of texts.
- e) Use vocabulary from other content areas.

## MATHEMATICS PROGRAMS

### Grades 3-12



#### ► **Elementary Mathematics: Grades 3-5**

Number Sense, Multiplication & Division, Fractions, Percent, Place Value, Positive & Negative Integers, Time, Money, and Measurement.

#### ► **Middle School Mathematics: Grades 6-8**

Number Sense Review, Fractions, Percent, Ratio, Introduction to Proportions, Time, Measurement, Intro to Geometry, and Pre-Algebra.

#### ► **High School Mathematics: Grades 9-12**

Pre-Algebra Review, Algebra 1 & 2, Geometry 1 & 2, Pre-Calculus

**Computation and Estimation****Focus: Computation and Fraction Operations**

3.4 The student will estimate solutions to and solve single-step and multistage problems involving the sum or difference of two whole numbers, each 9,999 or less, with or without regrouping.

3.5 The student will recall multiplication facts through Standards are placed with an emphasis on learning multiplication and division facts through the twelves table.

**Students will be fluent in the basic addition facts through the tens table and the corresponding subtraction facts. Concrete materials and two-dimensional representations will be used to introduce addition and subtraction with fractions and the concept of probability as chance. Students will use the twelves table, and the corresponding division facts.**

3.6 The student will represent multiplication and division, using area, set, and number line models, and create and solve problems that involve multiplication of two whole numbers, one factor 99 or less and the second factor 5 or less.

3.7 Write the fractions' names; and compare fractions having like and unlike denominators, using words and symbols ( $>$ ,  $<$ , or  $=$ ).

**Measurement**

Standard units (U.S. Customary and metric) to measure.

**Focus: U.S. Customary and Metric Units, Area and temperature, length, liquid volume, and weight.**

3.8 Students will identify relevant properties of shapes, points, line segments, rays, angles, verticals, and lines. Students will investigate and describe the identity and commutative properties for addition and multiplication.

**Number and Number Sense****Focus: Place Value and Fractions**

3.1 The student will a) read and write six-digit numerals and identify the place value and value of each digit; b) round

whole numbers, 9,999 or less, to the nearest ten, hundred, and thousand; and

b) compare two whole numbers between 0 and 9,999, using symbols ( $>$ ,  $<$ , or  $=$ ) and words (greater than, less than, or equal to).

3.2 The student will recognize and use the inverse relationships between addition/subtraction and multiplication/division

to complete basic fact sentences. The student will use these relationships to solve problems.

3.3 Students will learn to estimate, calculate and work with Perimeter, and Time

3.4 The student will determine, by counting, the value of a collection of bills and coins whose total value is \$5.00 or less, compare the value of the bills and coins, and make change.

3.5 The student will estimate and use U.S. Customary and metric units to measure

a) length to the nearest  $\frac{1}{2}$ -inch, inch, foot, yard, centimeter, and meter;

b) liquid volume in cups, pints, quarts, gallons, and liters; c) weight/mass in ounces, pounds, grams, and kilograms; and d) area and perimeter.

3.6 The student will a) measure the distance around a polygon in order to determine perimeter; and b) count the number of square units needed to cover a given surface in order to determine area.

3.7 The student will a) tell time to the nearest minute, using analog and digital clocks; and b) determine elapsed time in one-hour increments over a 12-hour period.

c) name and write fractions (including mixed numbers) 3.12 The student will identify equivalent periods of represented by a model;

d) model fractions (including mixed numbers) and time, including relationships among days, months, and years, as well as minutes and hours.

3.8 The student will read temperature to the nearest degree from a Celsius thermometer and a Fahrenheit thermometer. Real thermometers and physical models of thermometers will be used.

### **Geometry**

#### **Focus: Properties and Congruence Characteristics of Plane and Solid Figures**

3.9 The student will identify, describe, compare, and contrast characteristics of plane and solid geometric figures (circle, square, rectangle, triangle, cube, rectangular prism, square pyramid, sphere, cone, and cylinder) by identifying relevant characteristics, including the number of angles, verticals, and edges, and the number and shape of faces, using concrete models.

3.10 The student will identify and draw representations of points, line segments, rays, angles, and lines.

3.11 The student will identify and describe congruent and non-congruent plane figures.

### **Probability and Statistics**

#### **Focus: Applications of Data and Chance**

3.12 The student will a) collect and organize data, using observations, measurements, surveys, or experiments;

b) construct a line plot, a picture graph, or a bar graph to represent the data; and

c) read and interpret the data represented in line plots, bar graphs, and picture graphs and write a sentence analyzing the data.

3.13 The student will investigate and describe the concept of probability as chance and list possible results of a given situation.

Elementary math standards place emphasis on multiplication and division with whole numbers and the corresponding division facts as they become proficient in multiplying larger numbers. Students also will refine their estimation skills for computations and measurements. Students will identify and describe representations of points, lines, line segments, rays, and angles, including endpoints and verticals. Concrete materials and two-dimensional representations will be used to solve problems involving perimeter, patterns, probability, and equivalence of fractions and decimals. Students will recognize images of figures resulting from geometric Transformations, such as reflection, translation, and rotation. Students will investigate and describe the associative property for addition and multiplication.



**Number and Number Sense I****Focus: Place Value, Fractions, and Decimals**

4.1 The student will a) identify orally and in writing the place value for each digit in a whole number expressed through millions; b) compare two whole numbers expressed through millions, using symbols ( $>$ ,  $<$ , or  $=$ ); and c) round whole numbers expressed through millions to the nearest thousand, ten thousand, and hundred thousand.

4.2 The student will a) compare and order fractions and mixed numbers; b) represent equivalent fractions; and

c) identify the division statement that represents a fraction.

4.3 The student will a) read, write, represent, and identify decimals expressed through thousandths;

b) round decimals to the nearest whole number, tenth, and hundredth; c) compare and order decimals; and d) given a

model, write the decimal and fraction equivalents.

**Computation and Estimation****Focus: Factors and Multiples, and Fraction and Decimal Operations**

4.4 The student will a) estimate sums, differences, products, and quotients of whole numbers; b) add, subtract, and multiply whole numbers; c) divide

solving problems involving addition and subtraction of whole numbers, finding quotients with and without fractions and decimals by finding common multiples and factors. Students will be fluent in the basic multiplication facts through the twelves table remainders; and d) solve single-step and multi-step addition, subtraction, and multiplication problems with whole numbers.

4.5 The student will a) determine common multiples and factors, including least common multiple and greatest common factor; b) add and subtract fractions

4.11 The student will a) investigate congruence of plane figures after geometric transformations, such as having like and unlike denominators that are limited to reflection, translation, and rotation, using mirrors, 2, 3, 4, 5, 6, 8, 10, and 12, and simplify the resulting fractions, using common multiples and factors; c) add and subtract with decimals; and

d) solve single-step and multi-step practical problems involving addition and subtraction with fractions and with decimals.

**Measurement I****Focus: Equivalence within U.S. Customary and Metric Systems**

4.6 The student will a) estimate and measure paper folding, and tracing; and b) recognize the images of figures resulting from geometric transformations, such as translation, reflection, and rotation.

4.12 The student will a) define polygon; and b) identify polygons with 10 or fewer sides.

**Probability and Statistics****Focus: Outcomes and Data**

4.13 The student will a) predict the likelihood of an outcome of a simple event; and

b) represent probability as a number between 0 and 1, weight/mass and describe the results in U.S. Customary inclusive.



and metric units as appropriate; and b) identify equivalent measurements between units within the U.S. Customary system

(ounces, pounds, and tons) and between units within the metric system (grams and kilograms).

4.7 The student will a) estimate and measure length, and describe the result in both metric and U.S. Customary units; and

b) identify equivalent measurements between units within the U.S. Customary system (inches and feet; feet and yards; inches and yards; yards and miles) and between units within the metric system (millimeters and centimeters; centimeters and meters; and millimeters and meters).

4.8 The student will a) estimate and measure liquid volume and describe the results in U.S. Customary units; and b)

identify equivalent measurements. The student will collect, organize, display, and interpret data from a variety of graphs.

### **Patterns, Functions, and Algebra**

#### **Focus: Geometric Patterns, Equality, and Properties**

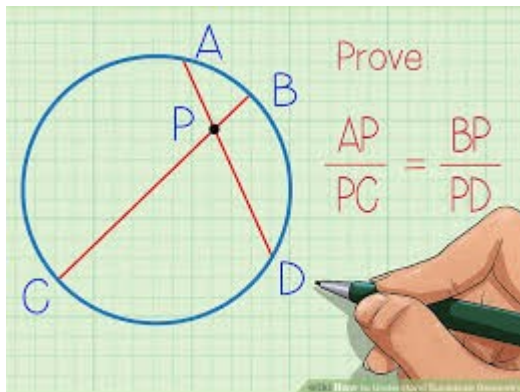
4.15 The student will recognize, create, and extend numerical and geometric patterns.

4.16 The student will a) recognize and demonstrate the meaning of equality in an equation; and b) investigate and describe the associative property for addition and multiplication.

Nationwide SOL's place emphasis on number sense with whole numbers, fractions, and decimals. This focus includes concepts of prime and composite numbers, identifying even and odd numbers, and solving problems using order of operations for positive between units within the U.S. Customary system (cups, whole numbers. Students will develop proficiency in pints, quarts, and gallons).

4.9 The student will determine elapsed time in hours and minutes within a 12-hour period.

### **Geometry I**



#### **Focus: Representations and Polygons**

4.10 The student will a) identify and describe the use of fractions and decimals to solve problems. Students will collect, display, and analyze data in a variety of ways and solve probability problems, using a sample space or tree diagram.

Students also will solve problems involving volume, area, and perimeter. Students will be introduced to variable expressions and representations of points, lines, line segments, rays, and open sentences, and will model one-step linear angles, including endpoints and verticals; and b) identify representations of lines that illustrate intersection, parallelism, and perpendicularity.

equations in one variable, using addition and subtraction. Students will investigate and recognize the distributive property.

All of these skills assist in the development of the algebraic concepts needed for success in the middle grades.

## **Number and Number Sense II**

### **Focus: Prime and Composite Numbers and Rounding Decimals**

5.1 The student, given a decimal through thousandths, will round to the nearest whole number, tenth, or hundredth., area, or volume is appropriate for a given situation; c) identify equivalent measurements within the metric system; d) estimate and then measure to solve problems, using U.S. Customary and metric units; and e) choose an appropriate unit of measure for a given situation involving measurement using U.S. Customary and metric units.

5.9 The student will identify and describe the diameter,

5.2 The student will a) recognize and name fractions in radius, chord, and circumference of a their equivalent decimal form and vice versa; and b) circle.

compare and order fractions and decimals in a given set 5.10 The student will determine an amount of elapsed from least to greatest and greatest to least.

5.3 The student will a) identify and describe the characteristics of prime and composite numbers; and

b) identify and describe the characteristics of even and odd numbers.

· Computation and Estimation

Compute time in hours and minutes within a 24-hour period.

5.11 The student will measure right, acute, obtuse, and straight angles

## **Geometry II**

### **Focus: Classification and Subdividing**

5.12 The student will classify a) angles as right, acute,

Focus: multi-step Applications and Order of Operations obtuse, or straight; and b) triangles as right, acute, 5.4 The student will create and solve single-step and multi-step practical problems involving addition, subtraction, multiplication, and division with and without remainders of whole numbers.

5.5 The student will a) find the sum, difference, product, and quotient of two numbers expressed as decimals through thousandths (divisors with only one nonzero digit); and b) create and solve single-step and multi-step practical problems involving decimals.

5.6 The student will solve single-step and multi-step practical problems involving addition and subtraction with fractions and mixed numbers and express answers in simplest form.

obtuse, equilateral, scalene, or isosceles.

5.13 The student, using plane figures (square, rectangle, triangle, parallelogram, rhombus, and trapezoid), will a) develop definitions of these plane figures; and b) investigate and describe the results of combining and subdividing plane figures.

**Probability and Statistics****Focus: Outcomes and Measures of Center**

5.14 The student will make predictions and determine the probability of an outcome by constructing a sample space.

5.15 The student, given a problem situation, will collect, organize, and interpret data in a variety of methods

5.7 The student will evaluate whole number numerical forms, using stem-and-leaf plots and line graphs, expressions, using the order of operations limited to parentheses, addition, subtraction, multiplication, and division.

**Measurement II****Focus: Perimeter, Area, Volume, and Equivalent Measures**

5.8 The student will a) find perimeter, area, and volume in standard units of measure; b) differentiate among perimeter,

area, and volume and identify whether the application of the concept of perimeter,

5.16 The student will a) describe mean, median, and mode as measures of center;

b) describe mean as fair share; c) find the mean, median, mode, and range of a set of data; and describe the range of a set of data as a measure of variation.

**ALGEBRA**

$$\frac{a^6}{a^3} = a^{6-3} = a^3$$

**Patterns, Functions, and Algebra****Focus: Equations and Properties**

5.17 The student will describe the relationship found in a number pattern and express the relationship.

5.18 The student will a) investigate and describe the concept of variable; b) write an open sentence to represent a given

mathematical relationship, using a variable; c) model one-step linear equations in one (storytelling), government (kings), and economic development (trade).

3.3 The student will study the exploration of the Americas by

variable, using addition and subtraction; and d) create an a) describing the accomplishments of Christopher

problem situation based on a given open sentence, using a single variable.

5.19 The student will investigate and recognize the distributive property of multiplication over addition.

## Social Sciences

### Elementary

#### **Introduction to History and Social Science**

The standards for third-grade students include an introduction to the heritage and contributions of the peoples of Ancient Greece, Rome and the West African empire of Mali.



- a) Students should continue developing map skills and demonstrate an understanding of basic economic concepts.
- b) Students will explain the importance of the basic principles of democracy and will identify the contributions of selected individuals.
- c) Students will recognize that Americans are a people who have diverse ethnic origins, customs, and traditions, who all contribute to American life, and who are united as Americans by common principles.

### History

3.1 The student will explain how the contributions of ancient Greece and Rome have influenced the present world in terms of architecture, government (direct and representative democracy), and sports.

3.2 The student will study the early West African empire of Mali by describing its oral tradition Columbus, Juan Ponce de León, Jacques Cartier, and Christopher Newport;

b) identifying the reasons for exploring, the information gained, the results of the travels, and the impact of the travels on American Indians.

### Geography

3.4 The student will develop map skills by a) locating Greece, Rome, and West Africa;

b) describing the physical and human characteristics of Greece, Rome, and West Africa;

c) explaining how the people of Greece, Rome, and West Africa adapted to and/or changed their environment to meet their needs.

3.5 The student will develop map skills by

a) positioning and labeling the seven continents and five oceans to create a world map;

b) using the equator and prime meridian to identify the Northern, Southern, Eastern, and Western Hemispheres;

c) locating the countries of Spain, England, and France; d) locating the regions in the Americas explored by Christopher Columbus (San Salvador in the Bahamas), Juan Ponce de León (near St. Augustine, Florida), Jacques Cartier (near Quebec, Canada), and Christopher Newport, (Jamestown, Virginia); e) locating specific places, using a simple letter-number grid system.

### 3.6 The student will read and construct maps, tables, graphs, and/or charts

#### Economics

3.7 The student will explain how producers in ancient Greece, Rome, and the West African empire of Mali used natural resources, human resources, and capital resources in the production of goods and services.

3.8 The student will recognize that because people and regions cannot produce everything they want, they specialize in what they do best and trade for 4th - 5th Grade Social Sciences. the rest.

3.9 The student will identify examples of making an economic choice and will explain the idea of opportunity cost (what is given up when making a choice).



#### Civics



3.10 The student will recognize the importance of government in the community, Virginia, and the United States of America by

a) explaining the purpose of rules and laws; Virginia Studies (For Grades 6-12: U.S. & World Studies are part of Social Sciences: to include U.S. & World History, U.S. & World Geography, and Political & Social Science)

The standards for Virginia Studies allow students to develop a greater understanding of Virginia's rich history, from the cultures of its native peoples and the

b) explaining that the basic purposes of government are founding of Jamestown to the present. Geographic, to make laws, carry out laws, and decide if laws have been broken;

c) explaining that government protects the rights and property of individuals.

3.11 The student will explain the importance of the basic principles that form the foundation of a republican form of government by a) describing the individual rights to life, liberty, and the pursuit of happiness; and equality under the law; economic, and civic concepts are presented within this historical context. Students will develop the skills needed to analyze, interpret, and demonstrate knowledge of important events and ideas in our history, and will understand the contributions made by people of diverse cultural and ethnic backgrounds. Students will use geographic tools to examine the influence of physical and cultural geography on Virginia history. Ideas that form the foundation for political institutions in Virginia and the United States b) identifying the contributions of George Washington; also will be included as part of the story of Virginia.



Thomas Jefferson; Abraham Lincoln; Rosa Parks; Thurgood Marshall; Martin Luther King, Jr.; and Cesar Chavez;

c) recognizing that Veterans Day and Memorial Day honor people who have served to protect the country's freedoms,

d) describing how people can serve the community, state, and nation.

3.12 The student will recognize that Americans are a people of diverse ethnic origins, customs, and traditions, who are united by the basic principles of a republican form of government and respect for individual rights and freedoms.

The study of history must emphasize the intellectual skills required for responsible citizenship. Students practice these skills as they extend their understanding of the essential knowledge defined by all of the standards for history and social science.

### Virginia Studies: The Physical Geography and Native Peoples

**The student will demonstrate knowledge of the physical geography and native peoples, past and present, of Virginia by**

a) locating Virginia and its bordering states on maps of the United States;

b) locating and describing Virginia's Coastal Plain (Tidewater), Piedmont, Blue Ridge Mountains, Valley and Ridge, and Appalachian Plateau;

c) locating and identifying water features important to the early history of Virginia (Atlantic Ocean, Chesapeake Bay, James River, York River, Potomac River, Rappahannock River, and Lake Drummond and the Dismal Swamp);

d) locating three American Indian language groups (the Algonquian, the Siouan, and the Iroquoian) on a map of Virginia;

e) describing how American Indians related to the climate and their environment to secure food, clothing, and shelter;

f) describing how enslaved African Americans, free African Americans, and American Indians in the Revolutionary War era, including George Washington, Thomas archaeologists have recovered new material evidence at Jefferson, Patrick Henry, and James Lafayette; sites including Werowocomoco and Jamestown;

g) identifying the importance of the Battle of Greag) identifying and locating the current state-recognized Bridge, the ride of Jack Jouett, and the tribes. Colonization and Conflict: 1607 through the American Revolution

The student will demonstrate knowledge of the first permanent English settlement in America by

a) explaining the reasons for English colonization;

b) describing how geography influenced the decision to settle at Jamestown;



- c) identifying the importance of the charters of the Virginia Company of London in establishing the Jamestown settlement;
- d) identifying the importance of the General Assembly (1619) as the first representative legislative body in English America;
- e) identifying the importance of the arrival of Africans and English women to the Jamestown settlement;
- f) describing the hardships faced by settlers at Jamestown and the changes that took place to ensure survival;
- g) describing the interactions between the English settlers and the native peoples, including the contributions of Powhatan to the survival of the settlers.

The student will demonstrate knowledge of life in the Virginia colony by

- a) explaining the importance of agriculture and its influence on the institution of slavery;
- b) describing how the culture of colonial Virginia reflected the origins of European (English, Scots-Irish, German) immigrants, Africans, and American Indians;
- c) explaining the reasons for the relocation of Virginia's capital from Jamestown to Williamsburg to Richmond;
- d) describing how money, barter, and credit were used;
- e) describing everyday life in colonial Virginia.

The student will demonstrate knowledge of the role of Virginia in the American Revolution by

- a) identifying the reasons why the colonies went to war with Great Britain, as expressed in the Declaration of Independence;
- b) identifying the various roles played by whites, American victory at Yorktown.

Sciences Courses Offered: The curriculum for the sciences change frequently.

## Sciences

### Elementary-Middle School Grades: Life & Earth Science

#### Earth Science

##### **Earth's Spheres and Structure:**

Forces that shape and change the Earth, including earthquakes, tsunamis and volcanoes, the spheres of Earth, the Earth's layers

##### **Understanding Plate Tectonics:**

Overview of Pangaea, theory of continental drift, plate boundaries

##### **Understanding Earthquakes**

Components of an earthquake, aftershocks and fore shocks, the Richter scale

##### **Understanding Volcanoes**

Types of volcanoes, volcanic land forms, lava flow, volcanic hazards

##### **Rock Deformation and Mountains**

Causes of rock deformation, types of geological folds and faults, mountain building

##### **Shaping the Earth's Surface**





Definition of topography, formation of stream valleys, how rivers and streams impact the Earth's surface

### **Thermal Energy**

The process of fuel becoming heat energy, how living organisms utilize energy, heat flow

### **Energy in the Earth System**

Solar energy, heat transfer, air masses and their impact on weather

### **Ecology and Ecosystems**

Levels of ecology, food chains, conservation biology, the carbon cycle

### **Earth's Energy Resources**

Renewable and nonrenewable resources, fossil fuels, nuclear energy, geothermal energy

### **Earth's Material Resources**

Definition of wilderness, rocks and minerals, types of rocks, the groundwater system

### **Earth Science Investigation and Experimentation**

Science vocabulary words, how to develop a scientific hypothesis, ways to present the findings of an investigation or experiment

## **Life Science I**

### **Unit 1 – Introduction to Living Things**

The materials in this chapter introduce and cover the introduction to living things. It is organized into sections that teach, reinforce and test students on the concepts of characteristics of living things, life cycles, stimuli and behavior, and homeostasis of organisms:

**Characteristics of living things** – Students are taught how to tell the difference between living and nonliving things based on characteristics common to living things, including growth and development, reproduction, cellular organization, use of energy, exchange of gases, and response to the environment.

**Life cycles** – Students will learn how to distinguish between the different life cycles of various organisms, including complete and incomplete metamorphosis and human life cycles.

**Stimuli and behavior** – Students must learn to predict how an organism will change its behavior given an external stimulus.

**Homeostasis of organisms and feedback** – Students are taught to predict how an organism's internal environment will respond given a stimulus.

**Unit 2 – Cells** The materials in this chapter introduce and cover the basics of cells. It is organized into sections that teach, reinforce and test students on the concepts of cell theory, prokaryotic and eukaryotic cells, cell structures, plant and animal cells, photosynthesis, cellular respiration, homeostasis of cells.

**Cell theory** – Students will learn how to explain the components of the scientific theory of cells: all organisms are composed of cells, all cells come from pre-existing cells, and cells are the basic unit of life.

**Prokaryotic and eukaryotic cells** – Students must learn to describe the structure and function of the nucleus and distinguish between a prokaryotic and eukaryotic cell.

**Cell structures** – Students are taught how to describe the structure and function of cell membranes, cytoplasm, and mitochondria.

**Plant and animal cells** – Students will learn how to describe the structure and function of cell walls, vacuoles, and chloroplasts, and distinguish between plant and animal cells.



**Photosynthesis** – Students must learn how to explain how light energy is transferred to chemical energy through the process of photosynthesis.

**Cellular respiration** – Students are taught how to describe and investigate how aerobic and anaerobic cellular respiration breaks down food to provide energy and releases carbon dioxide.

**Homeostasis of cells** – Students will learn to explain how cells of all organisms undergo similar processes to maintain homeostasis, including extracting energy from food, getting rid of waste, and reproduction.

### **Unit 3 – Unicellular and Multicellular Organisms**

The materials in this chapter introduce and cover the unicellular and multicellular organisms. It is organized into sections that teach, reinforce and test students on the concepts of cells and organisms, unicellular organisms, and multicellular organisms.

**Cells and organisms** – Students are taught how to compare life processes at the organism level with life processes at the cellular level.

**Unicellular organisms** – Students will learn how to identify unicellular organisms, including bacteria and protists, by their methods of locomotion, reproduction, ingestion, excretion, and effects on other organisms.

**Multicellular organisms** – Students must learn how to compare and contrast unicellular and multicellular organisms.

### **Unit 4 – Ecology**

The materials in this chapter introduce and cover ecology. It is organized into sections that teach, reinforce and test students on the concepts of Earth's biomes, biodiversity, ecosystems, biotic and abiotic factors, habitats and niches, and relationships between organisms.

**Earth's biomes** – Students are taught how to describe characteristics of Earth's major terrestrial and aquatic biomes.

**Biodiversity** – Students will learn how to describe the importance of biodiversity and major threats to biodiversity.

**Ecosystems** – Students must learn how to distinguish between the biosphere, ecosystems, communities, populations, and organisms.

**Biotic and abiotic factors** – Students are taught how to tell the difference between biotic and abiotic factors in an ecosystem.

**Habitats and niches** – Students will learn how to differentiate between habitats and niches.

**Relationships between organisms** – Students must learn how to compare and contrast the relationships among organisms such as mutualism, predation, parasitism, competition, and commensalism.

### **Unit 5 – Population Ecology**

The materials in this chapter introduce and cover population ecology. It is organized into sections that teach, reinforce and test students on the concepts of limiting factors in an ecosystem, population interactions, producers and photosynthesis, consumers, decomposers, energy in ecosystems, matter in ecosystems, and ecological succession.

## **Middle School Life Science II - Unicellular and Multicellular Organisms**

### **Unit 7 – Evolution**

The materials in this chapter introduce and cover evolution. It is organized into sections that teach, reinforce and test students on the concepts of evolution and diversity, mutation and variation, adaptation, natural selection, evidence for evolution, evolutionary trees, and extinction.

**Evolution and diversity** – Students will learn how to describe how organisms can change over time in response to environmental factors.

**Mutation and variation** – Students are taught how to describe how mutation causes variation in a population, and how species vary based on factors such as climate, changing land forms, inter-species interaction, and genetic mutation.

**Adaptation** – Students must learn to tell the difference between physical and behavioral adaptations in a variety of organisms.

**Natural selection** – Students are taught how to explain how reproductive success coupled with advantageous traits over many generations contributes to natural selection.

**Evidence for evolution** – Students will learn to describe how fossil evidence and comparative anatomy provide evidence for evolution.

**Evolutionary trees** – Students must learn how to construct a simple branching diagram to classify living groups of organisms by shared derived characteristics and expand the diagram to include fossil organisms.

**Extinction** – Students are taught how to explain why the extinction of a species may occur when the environment changes.

### Unit 8 – Classification

The materials in this chapter introduce and cover the topic of classification. It is organized into sections that teach, reinforce and test students on the concepts of domains and kingdoms, classification of life, and dichotomous keys.

**Domains and kingdoms** – Students are taught how to describe how living things are classified into domains and kingdoms.

**Classification of life** – Students will learn how to analyze how organisms can be classified by family, genus, and species.

**Dichotomous keys** – Students must learn how to classify an organism based on its physical characteristics using a dichotomous key.

### Unit 9 – Organs and Organ Systems

The materials in this chapter introduce and cover organs and organ systems. It is organized into sections that teach, reinforce and test students on the concepts of levels of organization in living things, integumentary system, skeletal and muscular systems, circulatory system, respiratory system, digestive system, excretory system, nervous system, endocrine system, reproductive systems, and disease and the immune system.

Lessons in this chapter are organized into the following sections:

**Levels of organization in living things** – Students are taught how to tell the difference between cells, tissues, organs, and organ systems.

**Integumentary system** – Students will learn how to relate the structure and function of the integumentary system.

**Skeletal and muscular systems** – Students must learn to relate the structure and function of the skeletal and muscular systems.

**Circulatory system** – Students are taught how to relate the structure and function of the circulatory system.

**Respiratory system** – Students learn how to relate the structure and function of the respiratory system.

**Digestive system** – Students must learn how to relate the structure and function of the digestive system.

**Excretory system** – Students are taught how to relate the structure and function of the excretory system.

**Nervous system** – Students will learn how to relate the structure and function of the nervous system.

**Endocrine system** – Students are taught how to relate the structure and function of the endocrine system.

## Unit 11 – Plants

The materials in this chapter introduce and cover the topic of plants. It is organized into sections that teach, reinforce and test students on the concepts of plant structures and plant reproduction.

**Plant structures** – Students will learn how to relate the structure and function of leaves, stems, and roots.

**Plant reproduction** – Students must learn to describe how flowering plants reproduce and how tropism effects the growth of seedlings.

## High School Grades 9-12 : Biology & Chemistry

### Chemistry I and II

#### Unit 1 – Science is a Process

The material in this Unit introduces and covers the idea that science is a process. It is organized into sections that teach, reinforce, and test students on the concepts of how we process measurement, significant digits, and scientific notation.



#### Unit 2 – Organizing Matter Patterns

The material in this Unit introduces and covers organizing matter patterns. It is organized into sections that teach, reinforce, and test students on the concepts of atoms: journey through time, how many or how much, periodic properties, electron configurations, covalent bonding, ionic bonding, metallic bonding, and molecular geometry.

#### Unit 3 – Language of Chemistry

The material in this Unit introduces and covers the language of chemistry. It is organized into sections that teach, reinforce, and test students on the concepts of chemical formulas and compounds, chemical equations and reactions, balancing chemical equations, and reactions and stoichiometry.

#### Unit 4 – Phases of Matter

The material in this Unit introduces and covers the phases of matter. It is organized into sections that teach, reinforce, and test students on the concepts of physical characteristics of gases, gas laws: Boyle's law, gas laws: Charles's law, gas laws: Gay-Lussac's law, gas laws: combined gas law, ideal gas law, molecular composition of gases, liquids and solids, and phase changes.

**Unit 5 – Solutions and Their Behavior**

The material in this Unit introduces and covers solutions and their behavior. It is organized into sections that teach, reinforce, and test students on the concepts of introduction to solutions, working with solutions, concentration of solutions, ions in aqueous solutions, colligative properties of solutions, acids and bases, and acid-base titration and pH.

**Unit 6 – Chemical Reactions**

The material in this Unit introduces and covers chemical reactions. It is organized into sections that teach, reinforce, and test students on the concepts of reaction energy and particle motion, reaction energy and reaction rate, chemical equilibrium, and oxidation-reduction reactions.

**Unit 7 – Organic Chemistry**

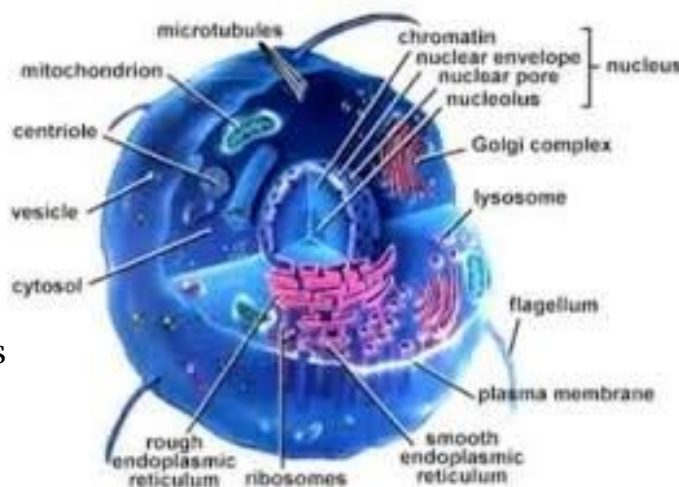
The material in this Unit introduces and covers organic chemistry. It is organized into sections that teach, reinforce, and test students on the concepts of carbon and organic compounds.

**Unit 8 – Nuclear Chemistry**

The material in this Unit introduces and covers nuclear chemistry. It is organized into sections that teach, reinforce, and test students on the concepts of nucleus, radioactive decay, and nuclear reactions.

**Biology I and II****Chapter 1 – Introduction to Biology**

The materials in this chapter introduce and cover the basics of biology. It is organized into sections that teach, reinforce, and test students on the concept of scientific processing.

**Chapter 2 – Understanding Living Things**

The materials in this chapter introduce and cover the understanding of living things. It is organized into sections that teach, reinforce, and test students on the concept of what characteristics define life and the needs of living things.

**Chapter 3 – Understanding Cells**

The materials in this chapter introduce and cover understanding cells. It is organized into sections that teach, reinforce, and test students on the concept of classifying life by cellular structure, cell membranes and cell walls, other structures in the cell, energy in the cell, and the cell as a whole.

**Chapter 4 – Understanding Genetics**

The materials in this chapter introduce and cover the basics of genetics. It is organized into sections that teach, reinforce, and test students on the concept of cellular reproduction, introduction to heredity: meiosis, Gregor Mendel and his peas, genetics, DNA, protein synthesis, and genetic engineering.

**Chapter 5 – Understanding Evolution**

The materials in this chapter introduce and cover the basics of evolution. It is organized into sections that teach, reinforce, and test students on the concept of natural selection and the history of life.

**Chapter 6 – Understanding Viruses**

The materials in this chapter introduce and cover the basics of viruses. It is organized into sections that teach, reinforce, and test students on the concept of understanding viruses.

**Chapter 7 – Understanding Prokaryotes**

The materials in this chapter introduce and cover the basics of prokaryotes. It is organized into sections that teach, reinforce, and test students on the concept of bacteria.

**Chapter 8 – Understanding Protists**

The materials in this chapter introduce and cover the basics of protists. It is organized into sections that teach, reinforce, and test students on the concepts of classifying protists, plant-like protists, and animal-like protists.

**Chapter 9 – Understanding Fungi**

The materials in this chapter introduce and cover the basics of fungi. It is organized into sections that teach, reinforce, and test students on the concept of introduction to fungi.

**Chapter 10 – Understanding Plants**

The materials in this chapter introduce and cover the basics of plants. It is organized into sections that teach, reinforce, and test students on the concepts of classifying plants, seedless vascular plants, gymnosperms and angiosperms, angiosperms, and tropism in plants.

**Chapter 11 – Understanding Animals**

The materials in this chapter introduce and cover the understanding of animals. It is organized into sections that teach, reinforce, and test students on the concept of introduction to animals, invertebrates: diversity discovered, invertebrates: transition to chordates, fishes and amphibians, reptiles, and birds and mammals.

**Chapter 12 – The Human Body**

The materials in this chapter introduce and cover the human body. It is organized into sections that teach, reinforce, and test students on the concept of levels of organization in the human body, maintaining homeostasis in the human body, the respiratory system, the cardiovascular system, the muscular skeletal systems, the integumentary system, the digestive and urinary systems, the nervous system, the endocrine system, and disease and the immune system.

**Chapter 13 – The Interdependence of Life**

The materials in this chapter introduce and cover the interdependence of life. It is organized into sections that teach, reinforce, and test students on the concept of levels of environmental organization, energy in an ecosystem, population interactions, life and the cycles that affect life and ecological succession and biodiversity.

**Chapter 14 – Ecosystems and Human Impact**

The materials in this chapter introduce and covers ecosystems and human impact. It is organized into sections that teach, reinforce and test students on the concept of land ecosystems, water ecosystems, pollution and resource use, loss of biodiversity and conservation.

---

**Notice to Northern Virginia Residents/Parents:**

Local Northern Virginia students enrolled in either the Earth, Biology, or Chemistry class participate in a once weekly lab and local field trips that correlate to concepts presented in the science curriculum.

**Have questions or need additional information?**

DeskTop Learning Academy & MommieTeachOnline Learning

Website - <http://www.mommieteachonline.com/>

(877) 669-0392 or 540-273-6080

**Email Me!**

[MommieTeach@MommieTeachOnline.com](mailto:MommieTeach@MommieTeachOnline.com)