

Grade 7 Pedagogical Overview

Two basic gestures characterize the 7th grade student: an appetite for knowledge about the world, and a budding capacity for reflection. As they move into early adolescence, seventh graders feel a yearning for independence and creative exploration, while wrestling with a certain anxiety and emotional sensitivity. During this time, they need increased opportunity to feel the strength of their own initiative. The grade seven curriculum serves to ground the students, to inspire them to venture out toward the unknown, and to offer an introduction to their quest in life. Through their own engagement and striving in the world, students are able to develop strong feelings of sympathy and antipathy in relation to their surroundings. These feelings help shape their own perceptions and allow them to stand on their own with increased confidence.

Throughout the 7th grade year, the teacher nurtures a growing capacity for independent critical thought, particularly in the sciences and mathematics. Curricular themes mirror the pupils' outer explorations. Topics include the age of discovery and navigation in history, the investigation of mineral substances in chemistry, and the study of mechanics in physics. Accurate reporting of experiments that the students see or perform themselves disciplines their dawning powers of observation. As their conceptual thinking increases, they are challenged to identify principles and to derive algebraic formulas from them.

In Language Arts, students learn to extend their research skills in order to make written and oral presentations on the subjects they study. The elements of logical discussion and critical thought enter into the life of the class, which develops the habit of seeing issues from many sides. In their writing, the students are capable of using a metaphor to represent a mood or ideal. In the same way, they are now capable of using a variable in mathematics to represent some practical situation in life. Algebra, with its expressions and equations, is a major theme in the seventh grade. The study of geometry extends to the Pythagorean Theorem, while a Main Lesson in perspective drawing blends artistic composition with mathematical accuracy.

The seventh graders' inner journey is met by Renaissance history, with its strong emphasis on individual artistic expression. A Main Lesson in creative writing shows them how to craft various moods and feelings into prose or poetry. They learn to develop such elements of style as figurative language, variation of sentence structure, and poetic meter and rhyme scheme. In the cultural aspects of geography, meanwhile, the students encounter the moods and thoughts of people and cultures from around the world, broadening their perspective of the human experience.

Through the exploration of many unknown worlds, the seventh-grade curriculum challenges the thought process of the young adolescent, leading them to discovery, understanding, and discernment. They learn, as the explorers did, that going one's own way means leaving behind the security and stability of familiar territory.

Language Arts:

- Historical novels and biographies
- Tales of adventure and discovery
- Stories about tribal life
- Ballads, legends, and folk tales
- Dictation
- Discussions based on logical reasoning and critical thought
- Sentence structure, clauses, and phrases

- Creative writing
- Note taking and summarizing
- Research projects
- Longer essays and comparisons

Mathematics:

- Number patterns: arithmetic, geometric, additive, and Fibonacci sequences
- Golden Ratio
- Ratio and Proportion
- Introduction to Algebra: integers, equations, and expressions
- Graphing points
- Exponents and roots
- Estimation and problem solving
- Basic angle theorems
- Pythagorean Theorem
- Area and perimeter

Social Studies:

- Late Middle Ages: rise of cities, nationhood, rivalry between church and state
- Renaissance to 1700: rise of the merchant class
- The Age of Discovery and Exploration from 1400
- Biographies may include: Eleanor of Aquitaine, Richard the Lion-Hearted, Francis of Assisi, Dante, Ferdinand and Isabella of Spain, Marco Polo, Vasco de Gama, Columbus, Magellan, Cortez, Sir Walter Raleigh, Galileo, Tycho Brahe, Kepler, Michelangelo, Leonardo da Vinci, Raphael, Lorenzo de Medici, Shakespeare, and Elizabeth I
- Geography and resources of Africa

Science:

- Inorganic chemistry: combustion, oxidation, formation of gases, metals and non-metals, chemical transformation, acids, bases, salts
- Human physiology: the nine systems, nutrition, hygiene, and first aid
- Physics: sound, light, heat, static electricity, mechanics (lever, gear, pulley, inclined plane, wedge, and screw)

Artistic Work:

- Painting: copying a Renaissance “master”
- Studies related to light and dark
- Perspective drawing
- Clay modeling related to study of physiology and Renaissance art

Specialty Subjects:

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| • Eurythmy | • Practical Arts |
| • Games | • Spanish |
| • Handwork | • Strings |
| • Music | • Woodwork |

Language Arts

In Grade 7 grammar, students extend their work in sentence structure through a study of compound and complex sentences. Preparation for compositions includes note-taking and developing an outline, while rough drafts are self- and peer-edited. The grading of all written work begins this year, on aspects including grammar, content, and expression. During a creative writing block, students learn to craft their writing in order to evoke such moods as wish, wonder, and surprise. Recitation includes much poetry, often of a lyric nature. A study of poetic meter and rhyme scheme is also taken up. Class reading books are selected that broaden the students' horizons regarding other peoples and cultures, and may include *I, Juan de Pareja*, *The Second Mrs. Giaconda* and *Call of the Wild*.

Writing

Throughout this year, students are encouraged to look at issues of historical or social relevance from contrasting angles, and even weigh one against the other. They also begin a formal study of creative writing and poetry. During this year, students are guided to become more interested in developing their own unique writing styles. This is an excellent time to begin to explore the realm of metaphor and poetic expression.

At the completion of Grade Seven, students should be able to:

- Demonstrate solid editing, proofreading, and revision skills
- Write legibly
- Exhibit clear thinking in writing
- Add details to clarify meaning or enhance impact of writing
- Create graphics and borders to support visual presentation of work
- Use words from class spelling and vocabulary studies in written work
- Show understanding of verb conjugation (regular/irregular verbs)
- Demonstrate understanding of simple/compound/complex sentences, phrases, and clauses
- Show understanding of first-person narrative and character development
- Identify and use simile and metaphor in writing
- Write a comparative essay to compare and contrast topics in block studies
- Demonstrate an understanding of narrative and descriptive writing styles
- Organize ideas to support the controlling idea of a piece
- Research social studies topic and complete written report

Reading

Seventh grade texts are chosen which widen the students' horizons with regard to other peoples and cultures. Stories from history focus on the Age of Discovery and the Renaissance. As in previous years, students will be expected to continue independent reading throughout the year. They will be asked to select a variety of fiction and non-fiction selections from a reading list provided by their teacher.

At the completion of Grade Seven, students should be able to:

- Read at least 10 books from an approved reading list

- Complete book report projects with written and oral components
- Draw critical conclusions from reading
- Analyze and discuss ideas from a variety of texts
- Read silently for a sustained length of time (1-2 hours)
- Read aloud with understanding and clear expression

Grammar and Study Skills

Students will continue to review and strengthen their understanding of language qualities and usage. In addition to building vocabulary and expanding their awareness of style, students will be asked to consider the ways in which language can be abused and misused. Cliché, jargon, euphemism, slang, and swear words may be discussed. Additional topics may also include: conditional phrasing, metaphor, simile, and analogy. In addition, skills such as taking notes and studying for tests will be introduced and reviewed.

At the completion of Grade Seven, students should be able to:

- Identify and use declarative, interrogative, exclamatory, and imperative statements
- Use correct punctuation and capitalization in all written work
- Use reference materials and library resources for research, including a dictionary, thesaurus, and databases
- Determine word origins and syllabication
- Achieve accuracy on spelling and vocabulary quizzes
- Take notes during oral presentations

Mathematics

In seventh grade, the students make the transition from the world of arithmetic to that of mathematics. The skills students have been learning and practicing in grades 1-6 are put to work and deepened in the study of ratios, geometry, word problems, and algebra. The topics of ratio, proportion, and rates are explored extensively. The students' increasing sense of logic allows them to articulate mathematical processes and patterns, allowing them to develop a sense of mathematical relationships. The Real Number System is explored, with an introduction to irrational numbers through an investigation of pi and roots. Students continue to work with prime and square numbers, and further mastery of the four processes using whole numbers, fractions, and decimals is emphasized through ongoing review and practical application.

Geometry takes its first analytical turn as students calculate angle measurements based on theorems and properties of figures, measure and construct angles using a protractor, explore the Golden Ratio, and are introduced to the Pythagorean Theorem.

During this year, students begin a more formal study of algebra. Facilities with simplifying and solving multi-step algebraic equations is furthered. It is a step into the world of abstract and logical thought. The gesture of more abstract thinking in mathematics is strongly developing in middle school and reaches its zenith during the high school years.

Number Sense

The general application and transformation of formulas and equations in practical life situations form a central part of the seventh grade math curriculum. As students are beginning to encounter the practical laws of cause and effect, they can start working strongly with estimation and distribution. Extensive mental arithmetic is used to challenge the students throughout this year. Continued mastery of the four processes using whole numbers, fraction, and decimals is emphasized through ongoing review and practical application.

At the completion of Grade Seven, students should be able to:

Understand basic principles of algebra, including variables, order of operations, and coefficients

Know how to solve one-step and multi-step equations

Use and explain the relationships among fractions, decimals, and percents, and make conversions

Identify and plot positive and negative numbers

Understand square numbers, exponents, and roots

Set-up a proportion

Demonstrate a clear grasp of factoring

Identify and use a circle, bar, and line graph

Computation

Work continues in business math, through budget, percentage, and discount problems. Ratio and simple proportion problems continue, as do problems with simple formulas. During this time when thinking skills are active, words problems are worked with extensively. Appropriate discriminatory strategies and skills in analyzing word problems are further developed.

At the completion of Grade Seven, students should be able to:

- Quickly and accurately access all math facts as a tool for problem solving
- Use a variety of problem-solving strategies:
 - *Guess and check
 - *Solve a simpler model
 - *Work backwards
 - *Make a table or graph
 - *Make a model or drawing
- Check one process by using the reverse process
- Select and use an appropriate method to solve a problem (mental math, estimation, paper and pencil) and use the appropriate operation needed
- Solve a problem in more than one way
- Use paper and pencil to solve:
 - *Calculation of scientific order of operations (P-E-MD-AS: Parenthesis, exponent, multiply, divide, add, subtract)
 - *Addition, subtraction, multiplication, and division of whole numbers, decimals, fractions, mixed numbers, and integers
 - *Calculate positive and negative integers using the four processes
 - *Calculate fractions, decimals, and percents in real life situations
- Mentally solve problems involving all four processes, squares, estimation, sets, and distribution
- Work extensively with proportion problems
- Use formulas to solve a variety of problems
- Use number sense to justify solutions to problems involving whole numbers, fractions, decimals, and percents.

- Use a calculator to add, subtract, multiply, and divide

Patterns, Statistics, and Algebra

During this year, students begin a more formal study of algebraic thinking. Facilities with simple equations and work with prime and square numbers is furthered. Powers and roots are also introduced.

At the completion of Grade Seven, students should be able to:

- Interpret, extend, and create complex number patterns
- Use formulas to develop and solve equations
- Use variables in an expression of equation with positive and negative numbers
- Use tables and simple rules to describe and analyze relationships between values
- Work problems with the correct order of operations
- Perform four processes algebraically
- Demonstrate understanding of the communicative, associative, and distributive properties with addition and multiplication
- Work with exponents
- Calculate averages
- Predict and analyze solutions to problems
- Generate and organize data in a variety of ways (tables, charts, graphs)
- Predict outcomes as fractions, decimals, ratios, and percents

Geometry and Measurement

Work with geometric proofs continues, building up through triangles and parallelograms to deductive proofs of the Pythagorean theorem. Familiarity and precision are developed with all basic geometric constructions.

At the completion of Grade Seven, students should be able to:

- Draw geometric constructions of simple and irregular polygons
- Accurately divide a circle into fifths and sevenths using tools
- Draw and identify various triangles: scalene, right, isosceles, equilateral, obtuse, acute
- Understand concepts of congruence and similarity in triangles, squares, and rectangles
- Compute areas and perimeters of basic polygons, including a circle
- Compute areas of surfaces of solids
- Calculate volume of rectangular solids using formulas
- Measure and construct angles using a protractor
- Construct a parallelogram and compute the area
- Prove the Pythagorean Theorem with visual and algebraic proofs
- Estimate and measure distance and area using standard and metric units
- Use money in real life situations to compute change, describe equivalencies, and determine percentages

Science

All Waldorf science education emphasizes a phenomenological approach in which concepts are derived from sense experiences. This allows students to develop a scientific attitude that

includes precise observation, detailed mental picturing of a phenomenon, and the capacity to meet all phenomena with clear, logical thinking. The focus in middle school is on identifying laws that come from cause-and-effect relationships in the world. All phenomena are now approached using a three-part sequence of observing, evaluating, and conceptualizing. Many hands-on experiments and visual approaches are employed in order to reach different learning styles in students. In this way, the critical thinking of every student is fostered in such skills as sequential thinking, analysis, pattern recognition, and prediction.

Physiology

In preceding grades, students have investigated the animal, plant and mineral worlds, with comparisons made to the human being. They now focus directly on the human body and do so primarily from the viewpoint of health and hygiene. The digestive, circulatory and respiratory systems are studied. The class also studies two sense organs, the eye and the ear, with consideration given to care of the senses in modern life. Students keep a food journal, investigate the lists of ingredients in processed foods, and discuss aspects of a healthy diet and lifestyle in general. In this way, the growing responsibility of the young person for their own health is encouraged.

At the completion of Grade 7, students should be able to:

- Create careful drawings of a number of organs, and write descriptive compositions concerning their form and function.
- Identify the three major food groups, citing examples of each.
- Describe the role of the liver, spleen, and gall bladder in digestion.
- Identify the types of blood vessels and describe the direction of blood flow.
- Distinguish among the functions of red blood cells, white blood cells, and platelets.
- Explain how the relationship of air and blood is established in the membranes (alveoli) of the lungs.
- Describe the process of hearing through the outer, middle, and inner ear.
- Cite the major parts of the eye and explain how vision occurs.
- Explain basic tenets of hygiene and the importance of protecting the body and senses

Inorganic Chemistry

Chemistry strongly engages the children's powers of observation and deepens their understanding of the earth's substances and forces. The subject begins with a study of combustion and its role in the transformation of matter. The students observe closely the way various substances burn and learn of the connection between combustion and human breathing. The generation of oxygen and carbon dioxide follows. The study of salts, and their relationship to acids and bases, comes next. Using limestone as an example, the students witness its breakdown through intense heat to quicklime and ultimately slaked lime, mirroring the industrial process used in the manufacture of mortar. The block also includes an investigation of various metals – their properties, and their cultural and historical significance. A final topic focuses on the properties of water, which leads to considerations of clean water for the entire earth.

At the completion of Grade 7, students should be able to:

- Take notes on demonstrations, including sketches of apparatus.
- Recall demonstrations clearly, using the Materials – Methods – Observations format.
- Explain what substances are combined to generate carbon dioxide.

- Explain what substances are combined to generate oxygen.
- Compare the result of adding carbon dioxide to a fire with adding oxygen to a fire.
- Cite examples of common acids and bases.
- Describe two different ways of determining whether a substance is acidic or basic.
- Conduct their own tests to determine whether various substances are acidic or basic.

Physics

In 7th grade Physics there is a significant increase in refining one's observations through the use of careful measurement. A stronger emphasis is also placed on arriving at a specific concept based on those observations. In 7th grade there is a continuation of the study of sound, light, heat, and electricity, and an introduction to mechanics.

At the completion of Grade 7, students should be able to:

- Identify load, effort and fulcrum on any lever.
- Give examples of 1st, 2nd, and 3rd class levers.
- Use algebra to develop laws of mechanical phenomena.
- Identify practical applications for simple machines in modern life.
- Memorize and give examples of the fundamental mechanical law: *The gain in force is paid for by greater distance traveled.*
- Understand that light can be reflected.
- Articulate the relationship between the image of an object and the actual object.
- Articulate the relationship between the angle of incidence and the angle of reflection.

Social Studies

In Grade 7 the students study European history from the late Middle Ages through the Renaissance.

There are usually three or four-week blocks devoted to this study. Biographies of people during this period may include: Eleanor of Aquitaine, Marco Polo, Joan of Arc, the Medici Family, and Martin Luther, as we explore the changes that the Reformation brought. During this fascinating and pivotal time students learn about the European explorers like Columbus and Magellan, and scientists like Copernicus and Galileo, who reformed people's view of the world and the heavens. Since the Renaissance was the flowering of culture, the lives of important artists such as Leonardo da Vinci, Michelangelo, and Raphael are explored. The students are further immersed in the time by creating their own reproductions of some of these Renaissance masters. The continued study of history also brings a developing understanding of European geography, including major cities and countries and a general sense of the character of northern European, southern Europe, eastern Europe, and western Europe.

African Geography

Seventh Grade Geography incorporates aspects of all other academic disciplines, both in the humanities and the sciences. The students continue to concern themselves with the cultural life and values of other peoples, discovering that the personality characteristics of peoples differ greatly. This can help young people in their own search for self-definition.

The study begins with the way in which maps influence our perception of the world. They focus

on the continent of Africa. Students explore Africa by tracing the courses of great rivers and come to know the peoples gathered around these waterways. The communal, extended-family aspect of many African lifestyles is highlighted.