Grade 6

Overview of Topics

Grade 6

English
I. Writing, Grammar, and Usage
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  B. Speaking and Listening
  C. Grammar and Usage
  D. Spelling
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VI. Industrialism, Capitalism, and Socialism
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II. Classical Music: From Baroque to Romantic
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Mathematics
I. Numbers and Number Sense
II. Ratio, Percent, and Proportion
  A. Ratio and Proportion
  B. Percent
III. Computation
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  B. Multiplication
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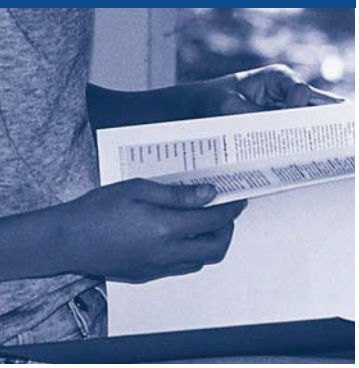
II. Oceans
III. Astronomy: Gravity, Stars, and Galaxies
IV. Energy, Heat, and Energy Transfer
  A. Energy
  B. Heat
  C. Physical Change: Energy Transfer
V. The Human Body: Lymphatic and Immune Systems
VI. Science Biographies

English: Grade 6



I. Writing, Grammar, and Usage

Teachers: Students should be given many opportunities for writing, both imaginative and expository, with teacher guidance that strikes a balance between encouraging creativity and requiring correct use of conventions. In sixth grade, it is appropriate to emphasize revision, with the expectation that students will revise and edit to produce (in some cases) a finished product that is thoughtful, well-organized, and reasonably correct in grammar, mechanics, and spelling. Continue imaginative writing but place a stronger emphasis than in previous grades on expository writing, including, for example, summaries, book reports, essays that explain a process, and descriptive essays. Note also the requirement below for writing persuasive essays, a research essay, and a standard business letter.

A. WRITING AND RESEARCH

- Learn strategies and conventions for writing a persuasive essay, with attention to
  - defining a thesis (that is, a central proposition, a main idea)
  - supporting the thesis with evidence, examples, and reasoning
  - distinguishing evidence from opinion
  - anticipating and answering counter-arguments
  - maintaining a reasonable tone
- Write a research essay, with attention to
  - asking open-ended questions
  - gathering relevant data through library and field research
  - summarizing, paraphrasing, and quoting accurately when taking notes
  - defining a thesis
  - organizing with an outline
  - integrating quotations from sources
  - acknowledging sources and avoiding plagiarism
  - preparing a bibliography
- Write a standard business letter.

B. SPEAKING AND LISTENING

- Participate civilly and productively in group discussions.
- Give a short speech to the class that is well-organized and well-supported.
- Demonstrate an ability to use standard pronunciation when speaking to large groups and in formal circumstances, such as a job interview.

C. GRAMMAR AND USAGE

- Understand what a complete sentence is, and
  - identify subject and predicate
  - identify independent and dependent clauses
  - correct fragments and run-ons
- Identify different sentence types, and write for variety by using
  - simple sentences
  - compound sentences
  - complex sentences
  - compound-complex sentences
- Correctly use punctuation introduced in earlier grades, and learn how to use a semi-colon or comma with *and, but,* or *or* to separate the sentences that form a compound sentence.
- Recognize verbs in active voice and passive voice, and avoid unnecessary use of passive voice.

- Recognize the following troublesome verbs and how to use them correctly:
  sit, set
  rise, raise
  lie, lay
- Correctly use the following:
  good / well
  between / among
  bring / take
  accept / except
  fewer / less
  like / as
  affect / effect
  who / whom
  imply / infer
  principle / principal
  their / there / they're

D. SPELLING

- Review spelling rules for use of *ie* and *ei;* for adding prefixes and suffixes
- Continue work with spelling, with special attention to commonly misspelled words, including:

Note: More commonly misspelled words are listed in grades 7 and 8.

acquaintance	develop	naturally	separate
amateur	embarrassed	occurrence	similar
analyze	exaggerate	parallel	sophomore
answer	exercise	peasant	substitute
athlete	fulfill	philosopher	success
Britain	gymnasium	possess	suspicion
characteristic	hypocrite	privilege	tragedy
committee	innocence	receipt	woman
conscious	interrupt	recommendation	writing
cooperate	license	repetition	
criticize	marriage	restaurant	
dependent	minimum	rhythm	

E. VOCABULARY

Teachers: Students should know the meaning of these Latin and Greek words that form common word roots and be able to give examples of English words that are based on them.

Note: More Latin and Greek words and roots are listed in grades 7 and 8. In the listings here, L = Latin, G = Greek. No single form of the Latin or Greek words is consistently used here, but rather the form that is most similar to related English words.

Latin/Greek Word	*Meaning*	*Examples*
annus [L]	year	annual, anniversary
ante [L]	before	antebellum, antecedent
aqua [L]	water	aquarium
astron [G]	star	astronaut, astronomy
bi [L]	two	bisect, bipartisan
bios [G]	life	biology, biography
centum [L]	hundred	cent, percent
decem [L]	ten	decade, decimal
dico, dictum [L]	say, thing said	dictation, dictionary
duo [G, L]	two	duplicate
ge [G]	earth	geology, geography
hydor [G]	water	hydrant, hydroelecrtric
magnus [L]	large, great	magnificent, magnify
mega [G]	large, great	megaphone, megalomania
mikros [G]	small	microscope, microfilm
minus [L]	smaller	diminish, minor
monos [G]	single	monologue, monarch, monopoly

omnis [L]	all	omnipotent, omniscient
phileo [G]	to love	philosophy, philanthropist
phone [G]	sound, voice	phonograph, telephone
photo [from G *phos]*	light	photograph, photocopy
poly [G]	many	polygon
post [L]	after	posthumous, posterity
pre [L]	before	predict, prepare
primus [L]	first	primary, primitive
protos [G]	first	prototype, protozoa
psyche[G]	soul, mind	psychology
quartus [L]	fourth	quadrant, quarter
tele [G]	at a distance	telephone, television, telepathy
thermos [G]	heat	thermometer, thermostat
tri [G, L]	three	trilogy, triangle
unus [L]	one	unanimous, unilateral
video, visum [L]	see, seen	evident, visual
vita [L]	life	vitality, vitamin

II. Poetry

A. POEMS

Teachers: The poems listed here constitute a selected core of poetry for this grade. You are encouraged to expose students to more poetry, old and new, and to have students write their own poems. To bring students into the spirit of poetry, read it aloud and encourage them to read it aloud so they can experience the music in the words. At this grade, poetry should be a source of delight, and, upon occasion, the subject of close attention. Students should examine some poems in detail, discussing what the poems mean as well as asking questions about the poet's use of language.

See also World History 6: Romanticism, *re* "Apostrophe to the Ocean" and "I Wandered Lonely as a Cloud."

All the world's a stage [from *As You Like It*] (William Shakespeare)
Apostrophe to the Ocean [from *Childe Harold's Pilgrimage*, Canto 4, Nos. 178-184] (George Gordon Byron)
I Wandered Lonely as a Cloud (William Wordsworth)
If (Rudyard Kipling)
Mother to Son (Langston Hughes)
Lift Ev'ry Voice and Sing (James Weldon Johnson)
A narrow fellow in the grass (Emily Dickinson)
A Psalm of Life (Henry Wadsworth Longfellow)
The Raven (Edgar Allan Poe)
A Song of Greatness (a Chippewa song, trans. Mary Austin)
Stopping by Woods on a Snowy Evening (Robert Frost)
Sympathy (Paul Laurence Dunbar)
There is no frigate like a book (Emily Dickinson)
The Walloping Window-blind (Charles E. Carryl)
Woman Work (Maya Angelou)

B. TERMS

meter
iamb
couplet
rhyme scheme
free verse

III. Fiction and Drama

Teachers: *The Iliad, The Odyssey,* and *Julius Caesar* are available in editions adapted for young readers.

See also World History 6: Ancient Greece, *re The Iliad* and *The Odyssey.*

See also World History 6: Ancient Rome, *re Julius Caesar.*

See also World History 6: Ancient Greece and Rome. Students who are not familiar with classical myths specified in grades 2 and 3 of the *Core Knowledge Sequence* should read those selections as well.

A. STORIES

The Iliad and *The Odyssey* (Homer)
The Prince and the Pauper (Mark Twain)

B. DRAMA

Julius Caesar (William Shakespeare)

C. CLASSICAL MYTHOLOGY

Apollo and Daphne
Orpheus and Eurydice
Narcissus and Echo
Pygmalion and Galatea

D. LITERARY TERMS

- Epic
- Literal and figurative language (review from grade 5)
  - imagery
  - metaphor and simile
  - symbol
  - personification

IV. Sayings and Phrases

Teachers: Every culture has phrases and proverbs that make no sense when carried over literally into another culture. For many children, this section may not be needed; they will have picked up these sayings by hearing them at home and among friends. But the sayings have been one of the categories most appreciated by teachers who work with children from home cultures that differ from the standard culture of literate American English.

All for one and one for all.
All's well that ends well.
Bee in your bonnet
The best-laid plans of mice and men oft go awry.
A bird in the hand is worth two in the bush.
Bite the dust
Catch-as-catch-can
Don't cut off your nose to spite your face.
Don't lock the stable door after the horse is stolen.
Don't look a gift horse in the mouth.
Eat humble pie
A fool and his money are soon parted.
A friend in need is a friend indeed.
Give the devil his due.
Good fences make good neighbors.
He who hesitates is lost.
He who laughs last laughs best.
Hitch your wagon to a star.
If wishes were horses, beggars would ride.
The leopard doesn't change his spots.
Little strokes fell great oaks.
Money is the root of all evil.
Necessity is the mother of invention.
It's never over till it's over.
Nose out of joint
Nothing will come of nothing.
Once bitten, twice shy.
On tenterhooks
Pot calling the kettle black
Procrastination is the thief of time.
The proof of the pudding is in the eating.
RIP
The road to hell is paved with good intentions.
Rome wasn't built in a day.
Rule of thumb
A stitch in time saves nine.
Strike while the iron is hot.
Tempest in a teapot
Tenderfoot
There's more than one way to skin a cat.
Touché!
Truth is stranger than fiction.

History and Geography: Grade 6

Teachers: The World History guidelines for sixth grade begin with a study of ancient civilizations introduced in earlier grades in the *Core Knowledge Sequence*. Topics include Judaism, Christianity, and the civilizations of ancient Greece and Rome. The focus in sixth grade should be on the legacy of enduring ideas from these civilizations—ideas about democracy and government, for example, or about right and wrong. After this study of lasting ideas from ancient civilizations, the World History guidelines pick up the chronological thread from earlier grades with a study of the Enlightenment. You are encouraged to use timelines and engage students in a brief review of some major intervening events in order to help students make a smooth transition across the gap in centuries between the ancient civilizations and the Enlightenment.

In sixth grade, the World History guidelines catch up chronologically with the American History guidelines. The World History guidelines take students up to the consequences of industrialization in the mid-nineteenth century, and this is where the American History guidelines begin.

World History and Geography

I. World Geography

Teachers: By sixth grade, children should have a good working knowledge of map-reading skills, as well as geographic terms and features introduced in earlier grades. The study of geography embraces many topics throughout the *Core Knowledge Sequence*, including topics in history and science. Geographic knowledge includes a spatial sense of the world, an awareness of the physical processes that shape life, a sense of the interactions between humans and their environment, an understanding of the relations between place and culture, and an awareness of the characteristics of specific regions and cultures. Many geographic topics are listed below in connection with historical topics.

A. SPATIAL SENSE (Working with Maps, Globes, and Other Geographic Tools)

Teachers: As necessary, review and reinforce topics from earlier grades, including:

- Continents and major oceans
- How to read maps and globes using longitude and latitude, coordinates, degrees
- Tropic of Cancer and Tropic of Capricorn: relation to seasons and temperature
- Climate zones: Arctic, Tropic, Temperate
- Time zones (review from Grade 4): Prime Meridian (O degrees); Greenwich, England; 180° Line (International Date Line)
- Arctic Circle (imaginary lines and boundaries) and Antarctic Circle

B. GREAT DESERTS OF THE WORLD

- What is a desert? Hot and cold deserts
- Major deserts in
  - Africa: Sahara, Kalahari
  - Australia: a mostly desert continent
  - Asia: Gobi; much of Arabian Peninsula
  - North America: Mojave, Chihuahuan, Sonoran
  - South America: Atacama Desert

Note: In earlier grades, children were introduced to major rivers (see Geography 3), mountains (see Geography 4), and lakes (see Geography 5) of the world.

II. Lasting Ideas from Ancient Civilizations

A. JUDAISM AND CHRISTIANITY

Teachers: Since religion is a shaping force in the story of civilization, the *Core Knowledge Sequence* introduces children in the early grades to major world religions, beginning with a focus on geography and major symbols and figures. Here in the sixth grade the focus is on history, geography, and ideas. The purpose is not to explore matters of theology but to understand the place of religion and religious ideas in history. The goal is to familiarize, not proselytize; to be descriptive, not prescriptive. The tone should be one of respect and balance: no religion should be disparaged by implying that it is a thing of the past.

A review of major religions introduced in earlier grades in the *Core Knowledge Sequence* is recommended: Judaism/Christianity/Islam (grade 1), Hinduism/Buddhism (grade 2), Islam (grade 4), and Buddhism/Shintoism (grade 5).

- Basic ideas in common
  - The nature of God and of humanity
  - Hebrew Bible and Old Testament of Christian Bible
- Judaism: central ideas and moral teachings
  - Torah, monotheism
  - The idea of a "covenant" between God and man
  - Concepts of law, justice, and social responsibility: the Ten Commandments
- Christianity: central ideas and moral teachings
  - New Testament
  - The Sermon on the Mount and the two "great commandments" (Matthew 22: 37-40)
- Geography of the Middle East
  - Birthplace of major world religions: Judaism, Christianity, Islam
  - Anatolian Peninsula, Arabian Peninsula
  - Mesopotamia, Tigris and Euphrates Rivers
  - Atlas Mountains, Taurus Mountains
  - Mediterranean Sea, Red Sea, Black Sea, Arabian Sea, Persian Gulf
  - The "silk road"
  - Climate and terrain: vast deserts (Sahara, Arabian)

Note: Students will examine the political and physical geography of the present-day Middle East in grade 8.

B. ANCIENT GREECE

Teachers: Briefly review from grade 2: religion, art, architecture, daily life of ancient Greece.

- The Greek polis (city-state) and patriotism
- Beginnings of democratic government: Modern American democratic government has its roots in Athenian democracy (despite the obvious limitations on democracy in ancient Greece, for example, slavery, vote denied to women)
  - The Assembly
  - Suffrage, majority vote
- The "classical" ideal of human life and works
  - The ideal of the well-rounded individual and worthy citizen
  - Pericles and the "Golden Age"
  - Architecture: the Parthenon
  - Games: The Olympics
- Greek wars: victory and hubris, defeat and shame
  - Persian Wars: Marathon, Thermopylae, Salamis
  - The Peloponnesian War: Sparta defeats Athens
- Socrates and Plato
  - Socrates was Plato's teacher; we know of him through Plato's writings.
  - For Socrates, wisdom is knowing that you do not know.
  - The trial of Socrates

See also English 6: Homer, *The Iliad* and *The Odyssey* and Classical Mythology.

See also Visual Arts 6: Raphael's *School of Athens*. You may also want to examine David's *Death of Socrates*.

- Plato and Aristotle
  - Plato was Aristotle's teacher.
  - They agreed that reason and philosophy should rule our lives, not emotion and rhetoric.
  - They disagreed about where true "reality" is: Plato says it is beyond physical things in ideas (cf. the "allegory of the cave"); Aristotle says reality is only in physical things.
- Alexander the Great and the spread of Greek ("Hellenistic") culture: the library at Alexandria

C. ANCIENT ROME

Teachers: Briefly review from grade 3: Romulus and Remus, Roman gods, legends, daily life, etc.

- The Roman Republic
  - Builds upon Greek and classical ideals
  - Class and status: patricians and plebeians, slaves
  - Roman government: consuls, tribunes, and senators
- The Punic Wars: Rome vs. Carthage
- Julius Caesar
- Augustus Caesar
  - Pax Romana
  - Roman law and the administration of a vast, diverse empire
  - Virgil, *The Aeneid*: epic on the legendary origins of Rome
- Christianity under the Roman Empire
  - Jesus's instruction to "Render unto Caesar the things which are Caesar's, and unto God the things that are God's" [Matthew 22:21]
  - Roman persecution of Christians
  - Constantine: first Christian Roman emperor
- The "decline and fall" of the Roman Empire
  - Causes debated by historians for many hundreds of years (outer forces such as shrinking trade, attacks and invasions vs. inner forces such as disease, jobless masses, taxes, corruption and violence, rival religions and ethnic groups, weak emperors)
  - Rome's "decline and fall" perceived as an "object lesson" for later generations and societies

See also English 6: Shakespeare's *Julius Caesar.*

III. The Enlightenment

Teachers: You are encouraged to use timelines and engage students in a brief review of some major intervening events in order to help students make a smooth transition across the gap in centuries between the ancient civilizations and the Enlightenment. Place the Enlightenment (17th and 18th centuries) in chronological context, in relation to eras and movements studied in earlier grades (Middle Ages, Age of Exploration & Renaissance, American Revolution, etc.).

See also Science 6: Science Biographies: Isaac Newton.

- Faith in science and human reason, as exemplified by
  - Isaac Newton and the laws of nature
  - Descartes: "cogito ergo sum"
- Two ideas of "human nature": Thomas Hobbes and John Locke
  - Hobbes: the need for a strong governing authority as a check on "the condition of man . . . [which] is a condition of war of everyone against everyone"
  - Locke: the idea of man as a "tabula rasa" and the optimistic belief in education; argues against doctrine of divine right of kings and for government by consent of the governed
- Influence of the Enlightenment on the beginnings of the United States
  - Thomas Jefferson: the idea of "natural rights" in the Declaration of Independence
  - Montesquieu and the idea of separation of powers in government

IV. The French Revolution

Teachers: While the focus here is on the French Revolution, make connections with what students already know about the American Revolution, and place the American and French Revolutions in the larger global context of ideas and movements.

- The influence of Enlightenment ideas and of the English Revolution on revolutionary movements in America and France
- The American Revolution: the French alliance and its effect on both sides
- The Old Regime in France (*L'Ancien Régime*)
  - The social classes: the three Estates
  - Louis XIV, the "Sun King": Versailles
  - Louis XV: *"Après moi, le déluge"*
  - Louis XVI: the end of the Old Regime
  - Marie Antoinette: the famous legend of "Let them eat cake"
- 1789: from the Three Estates to the National Assembly
  - July 14, Bastille Day
  - Declaration of the Rights of Man
  - October 5, Women's March on Versailles
  - "Liberty, Equality, Fraternity"
- Louis XVI and Marie Antoinette to the guillotine
- Reign of Terror: Robespierre, the Jacobins, and the "Committee of Public Safety"
- Revolutionary arts and the new classicism
- Napoleon Bonaparte and the First French Empire
  - Napoleon as military genius
  - Crowned Emperor Napoleon I: reinventing the Roman Empire
  - The invasion of Russia
  - Exile to Elba
  - Wellington and Waterloo

See also Visual Arts 6: David, *Oath of the Horatii;* Delacroix, *Liberty Leading the People*.

V. Romanticism

- Beginning in early nineteenth century Europe, Romanticism refers to the cultural movement characterized by:
  - The rejection of classicism and classical values
  - An emphasis instead on emotion and imagination (instead of reason)
  - An emphasis on nature and the private self (instead of society and man in society)
- The influence of Jean-Jacques Rousseau's celebration of man in a state of nature (as opposed to man in society): "Man is born free and everywhere he is in chains"; the idea of the "noble savage"
- Romanticism in literature, the visual arts, and music

See also English 6: Wordsworth, "I Wandered Lonely as a Cloud"; Byron, "Apostrophe to the Ocean" (from *Childe Harold's Pilgrimage*); Visual Arts 6, Romantic Art; and Music 6, Romantic Music.

VI. Industrialism, Capitalism, and Socialism

A. THE INDUSTRIAL REVOLUTION

- Beginnings in Great Britain
  - Revolution in transportation: canals, railroads, new highways
  - Steam power: James Watt
- Revolution in textiles: Eli Whitney and the cotton gin, factory production
- Iron and steel mills
- The early factory system
  - Families move from farm villages to factory towns
  - Unsafe, oppressive working conditions in mills and mines
  - Women and child laborers
  - Low wages, poverty, slums, disease in factory towns
  - Violent resistance: Luddites

Note: In sixth grade, the World History guidelines catch up chronologically with the American History guidelines. The World History guidelines take students up to the consequences of industrialization in the mid-nineteenth century, and this is where the American History guidelines begin. See American History 6, Industrialization and Urbanization.

B. **CAPITALISM**
- Adam Smith and the idea of laissez faire vs. government intervention in economic and social matters
- Law of supply and demand
- Growing gaps between social classes: Disraeli's image of "two nations" (the rich and the poor)

C. **SOCIALISM**
- An idea that took many forms, all of which had in common their attempt to offer an alternative to capitalism
  For the public ownership of large industries, transport, banks, etc., and the more equal distribution of wealth
- Marxism: the Communist form of Socialism
  Karl Marx and Friedrich Engels, The Communist Manifesto: "Workers of the world, unite!"
  Class struggle: bourgeoisie and proletariat
  Communists, in contrast to Socialists, opposed all forms of private property.

See also American History 6: Labor, International Workers of the World; Eugene Debs.

VII. Latin American Independence Movements

A. **HISTORY**
- The name "Latin America" comes from the Latin origin of the languages now most widely spoken (Spanish and Portuguese).
- Haitian revolution
  Toussaint L'Ouverture
  Abolition of West Indian slavery
- Mexican revolutions
  Miguel Hidalgo
  José María Morelos
  Santa Anna vs. the United States
  Benito Juárez
  Pancho Villa, Emiliano Zapata
- Liberators
  Simon Bolivar
  José de San Martín
  Bernardo O'Higgins
- New nations in Central America: Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua
- Brazilian independence from Portugal

B. **GEOGRAPHY OF LATIN AMERICA**
- Mexico: Yucatan Peninsula, Mexico City
- Panama: isthmus, Panama Canal
- Central America and South America: locate major cities and countries including
  Caracas (Venezuela)
  Bogota (Colombia)
  Quito (Ecuador)
  Lima (Peru)
  Santiago (Chile)
  La Paz (Bolivia)
- Andes Mountains
- Brazil: largest country in South America, rain forests, Rio de Janeiro, Amazon River
- Argentina: Rio de la Plata, Buenos Aires, Pampas

American History and Geography

Teachers: The sixth grade American History guidelines pick up chronologically with the World History guidelines on mid-nineteenth century industrialism and its consequences.

I. Immigration, Industrialization, and Urbanization

A. IMMIGRATION

- Waves of new immigrants from about 1830 onward
  - Great migrations from Ireland (potato famine) and Germany
  - From about 1880 on, many immigrants arrive from southern and eastern Europe.
  - Immigrants from Asian countries, especially China
  - Ellis Island, "The New Colossus" (poem on the Statue of Liberty, written by Emma Lazarus)
  - Large populations of immigrants settle in major cities, including New York, Chicago, Philadelphia, Detroit, Cleveland, Boston, San Francisco
- The tension between ideals and realities
  - The metaphor of America as a "melting pot"
  - America perceived as "land of opportunity" vs. resistance, discrimination, and "nativism"
  - Resistance to Catholics and Jews
  - Chinese Exclusion Act

See below, Reform: Jane Addams, settlement houses; Jacob Riis, ghettos in the modern city.

B. INDUSTRIALIZATION AND URBANIZATION

- The post-Civil War industrial boom
  - The "Gilded Age"
  - The growing gap between social classes
  - Horatio Alger and the "rags to riches" story
  - Growth of industrial cities: Chicago, Cleveland, Pittsburgh
  - Many thousands of African-Americans move north.
  - Urban corruption, "machine" politics: "Boss" Tweed in New York City, Tammany Hall
- The condition of labor
  - Factory conditions: "sweat shops," long work hours, low wages, women and child laborers
  - Unions: American Federation of Labor, Samuel Gompers
  - Strikes and retaliation: Haymarket Square; Homestead, Pennsylvania
  - Labor Day
- The growing influence of big business: industrialists and capitalists
  - "Captains of industry" and "robber barons": Andrew Carnegie, J. P. Morgan, Cornelius Vanderbilt
  - John D. Rockefeller and the Standard Oil Company as an example of the growing power of monopolies and trusts
  - Capitalists as philanthropists (funding museums, libraries, universities, etc.)
- "Free enterprise" vs. government regulation of business: Interstate Commerce Act and Sherman Antitrust Act attempt to limit power of monopolies

See also World History 6: Industrial Revolution.

See also World History 6: Capitalism, laissez-faire.

II. Reform

- Populism
  - Discontent and unrest among farmers
  - The gold standard vs. "free silver"
  - William Jennings Bryan
- The Progressive Era
  - "Muckraking": Ida Tarbell on the Standard Oil Company; Upton Sinclair, *The Jungle*, on the meat packing industry
  - Jane Addams: settlement houses

See also English 6: Poetry, Paul Laurence Dunbar, "Sympathy."

Note: Briefly review people and ideas studied in grade 4, American History, Reformers: Women's Rights.

See also World History 6: Socialism and Capitalism.

Jacob Riis, *How the Other Half Lives*: tenements and ghettos in the modern city
President Theodore (Teddy) Roosevelt: conservation and trust-busting

- Reform for African-Americans
  - Ida B. Wells: campaign against lynching
  - Booker T. Washington: Tuskegee Institute, Atlanta Exposition Address, "Cast down your bucket where you are"
  - W. E. B. DuBois: founding of NAACP, "The problem of the twentieth century is the problem of the color line," *The Souls of Black Folk*
- Women's suffrage
  - Susan B. Anthony
  - Nineteenth Amendment (1920)
- The Socialist critique of America: Eugene V. Debs

Visual Arts: Grade 6

SEE INTRODUCTION, "The Arts in the Curriculum."

Teachers: In schools, lessons on the visual arts should illustrate important elements of making and appreciating art, and emphasize important artists, works of art, and artistic concepts. When appropriate, topics in the visual arts may be linked to topics in other disciplines. While the following guidelines specify a variety of artworks in different media and from various cultures, they are not intended to be comprehensive. Teachers are encouraged to build upon the core content and expose children to a wide range of art and artists.

In studying the works of art specified below, and in creating their own art, students should review, develop, and apply concepts introduced in previous grades, such as line, shape, form, space, texture, color, light, design, and symmetry.

I. Art History: Periods and Schools

Teachers: The focus here is intended to combine art history with analysis of specific illustrative works. Introduce the idea of classifying Western art by periods and schools, with major characteristics of each period and school. Timelines may help students situate the periods and schools. Note that the periods and characteristics are not absolute distinctions but generally helpful categories (to which there are always exceptions) often used in discussions of art. The following topics extend to the mid-nineteenth century. In later grades, students will examine late-nineteenth and twentieth-century art movements.

See also World History 6: Lasting Ideas from Greece and Rome, *re* Classical art.

A. CLASSICAL ART: THE ART OF ANCIENT GREECE AND ROME

- Observe characteristics considered "classic"—emphasis on balance and proportion, idealization of human form—in
  The Parthenon and the Pantheon
  The Discus Thrower and *Apollo Belvedere*

See Visual Arts 4 for more detailed guidelines on Gothic architecture.

B. GOTHIC ART (ca. 12th - 15th centuries)

- Briefly review the religious inspiration and characteristic features of Gothic cathedrals.

See Visual Arts 5 for more detailed guidelines on Renaissance art. See also World History 6: Lasting Ideas from Greece and Rome, *re* Raphael's *School of Athens.*

C. THE RENAISSANCE (ca. 1350-1600)

- Briefly review main features of Renaissance art (revival of classical subjects and techniques, emphasis on humanity, discovery of perspective) and examine representative works, including
  Raphael, *The School of Athens*
  Michelangelo, *David* (review from grade 5)

D. BAROQUE (ca. 17th century)

- Note the dramatic use of light and shade, turbulent compositions, and vivid emotional expression in
  El Greco, *View of Toledo* (also known as *Toledo in a Storm*)
  Rembrandt: a self-portrait, such as *Self-Portrait, 1659*

E. ROCOCO (ca. mid- to late-1700's)

- Note the decorative and "pretty" nature of Rococo art, the use of soft pastel colors, and the refined, sentimental, or playful subjects in
  Jean Honoré Fragonard, *The Swing*

See also World History 6: French Revolution, *re* David. You may also wish to introduce David's *Death of Socrates* when you study Lasting Ideas from Greece and Rome. See World History 6.

See also World History 6: Romanticism, *re* Romantic art; and French Revolution, *re* Delacroix's *Liberty Leading the People.*

F. NEOCLASSICAL (ca. late 18th - early 19th century)

- Note as characteristic of Neoclassical art the reaction against Baroque and Rococo, the revival of classical forms and subjects, belief in high moral purpose of art, and balanced, clearly articulated forms in
  Jacques Louis David, *Oath of the Horatii*

G. ROMANTIC (ca. late 18th - 19th century)

- Note how Romantic art is in part a reaction against Neoclassicism, with a bold, expressive, emotional style, and a characteristic interest in the exotic or in powerful forces in nature, in
  Francisco Goya, *The Bullfight*
  Eugene Delacroix, *Liberty Leading the People*
  Caspar David Friedrich, *The Chalk Cliffs on Rugen*

H. REALISM (ca. mid- to late-19th century)

- Note the Realist's characteristic belief that art should represent ordinary people and activities, that art does not have to be uplifting, edifying, or beautiful, in
  Jean Millet, *The Gleaners*
  Gustave Courbet, *The Stone Breakers*
- Become familiar with examples of American realism, including
  Winslow Homer, *Northeaster*
  Thomas Eakins, *The Gross Clinic*
  Henry O. Tanner, *The Banjo Lesson*

Music: Grade 6

SEE INTRODUCTION, "The Arts in the Curriculum."

I. Elements of Music

Teachers: The Music guidelines for grades 6–8 share a basic vocabulary of the elements of music that can inform the discussion, appreciation, and study of selected musical works. Following these guidelines are recommendations in each grade for a core of musical content, broadly organized as a history of music from early to modern times, with attention to specific periods, composers, and genres. While these guidelines focus on musical vocabulary, appreciation, and history, musical performance should be encouraged and emphasized as local resources allow.

- Review as necessary from earlier grades:
  The orchestra and families of instruments (strings, wind, brass, percussion); keyboard instruments
  Vocal ranges: soprano, mezzo-soprano, alto; tenor, baritone, bass
- Recognize frequently used Italian terms:
  grave (very very slow)
  largo (very slow)
  adagio (slow)
  andante (moderate; "walking")
  moderato (medium)
  allegro (fast)
  presto (very fast)
  prestissimo (as fast as you can go)
  ritardando and *accelerando* (gradually slowing down and getting faster)
  crescendo and *decrescendo* (gradually increasing and decreasing volume)
  legato (smoothly flowing progression of notes), *staccato* (crisp, distinct notes)
- Recognize introduction, interlude, and coda in musical selections.
- Recognize theme and variations.
- Identify chords [such as I (tonic), IV (subdominant), V (dominant); V7]; major and minor chords; chord changes; intervals (third, fourth, fifth).
- Understand what an octave is.
- Understand the following notation and terms:

  names of lines and spaces in the treble clef; middle C

  𝄞 treble clef 𝄢 bass clef staff, bar line, double bar line, measure, repeat signs

  𝅝 whole note 𝅗𝅥 half note ♩ quarter note ♪ eighth note

  whole rest, half rest, quarter rest, eighth rest

  grouped sixteenth notes

  tied notes and dotted notes

  ♯ sharps ♭ flats ♮ naturals

  Da capo [D.C.] *al fine*

  meter signature: $\frac{4}{4}$ or common time $\frac{2}{4}$ $\frac{3}{4}$ $\frac{6}{8}$

  soft *pp* *p* *mp* loud *mf* *f* *ff*

II. Classical Music: From Baroque to Romantic

Teachers: While these guidelines focus on musical vocabulary, appreciation, and history, musical performance should be encouraged and emphasized as resources allow. The focus here combines music history with appreciation of illustrative works, and introduces the idea of classifying Western music by periods, with examples of specific composers and works, as well as some associated musical terms. Timelines may help students situate the periods. The periods and their characteristics are not absolute distinctions but generally helpful categories often used in discussions of music. A brief review of Medieval (grade 4) and Renaissance (grade 5) music is suggested.

Note: *re* Baroque music, recall from grade 2, Antonio Vivaldi, *The Four Seasons.*

A. BAROQUE (ca. 1600-1750)

- Counterpoint, fugue, oratorio
- Johann Sebastian Bach: selections from *Brandenburg Concertos*, selections from *The Well-Tempered Clavier*, selections from the *Cantatas* such as *BWV 80, BWV 140*, or *BWV 147*
- George Frederick Handel: selections from *Water Music*, "Hallelujah Chorus" from *The Messiah*

Note: *re* classical symphony, recall from grade 4, Haydn, *Symphony No. 94* ("Surprise"); and, from grade 5, Beethoven, *Symphony No. 5.*

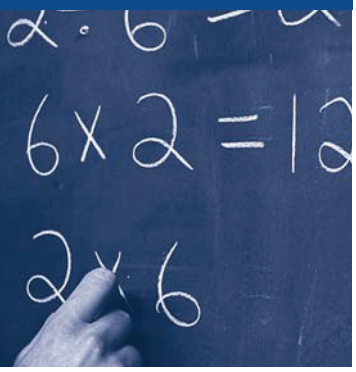
B. CLASSICAL (ca. 1750-1825)

- The classical symphony (typically in four movements)
  Wolfgang Amadeus Mozart, *Symphony No. 40*
- The classical concerto: soloist, cadenza
  Wolfgang Amadeus Mozart, *Piano Concerto No. 21*
- Chamber music: string quartet, sonata
  Franz Joseph Haydn, *String Quartet Opus 76 No. 3, "Emperor"*
  Ludwig van Beethoven, *Piano Sonata No. 14 ("Moonlight" Sonata)*

Note: Beethoven and Schubert are often considered transitional figures between Classic and Romantic. Students will study other Romantic composers in seventh grade, including Brahams, Berlioz, Liszt, and Wagner.

C. ROMANTIC (ca. 1800-1900)

- Beethoven as a transitional figure: *Symphony No. 9* (fourth movement)
- Romantic composers and works:
  Franz Schubert, lieder (art songs): *Die Forelle* ("The Trout"), *Gretchen am Spinnrade* ("Gretchen at the Spinning Wheel")
  Frederic Chopin: "Funeral March" from *Piano Sonata No. 2 in B flat minor, "Minute" Waltz, "Revolutionary" Etude in C minor*
  Robert Schumann, *Piano Concerto in A Minor*



Mathematics: Grade 6

Teachers: Mathematics has its own vocabulary and patterns of thinking. It is a discipline with its own language and conventions. Thus, while some lessons may offer occasional opportunities for linking mathematics to other disciplines, it is critically important to attend to math as math. From the earliest years, mathematics requires incremental review and steady practice: not only the diligent effort required to master basic facts and operations, but also thoughtful and varied practice that approaches problems from a variety of angles, and gives children a variety of opportunities to apply the same concept or operation in different types of situations. While it is important to work toward the development of "higher-order problem-solving skills," it is equally important—indeed, it is prerequisite to achieving "higher order" skills—to have a sound grasp of basic facts, and an automatic fluency with fundamental operations.

I. Numbers and Number Sense

- Read and write numbers (in digits and words) up to the trillions.
- Recognize place value up to hundred-billions.
- Integers (review):
  - Locate positive and negative integers on a number line.
  - Compare integers using <, >, =.
  - Know that the sum of an integer and its opposite is 0.
  - Add and subtract positive and negative integers.
- Determine whether a number is a prime number or composite number.
- Round to the nearest ten; to the nearest hundred; to the nearest thousand; to the nearest hundred thousand; to the nearest million.
- Compare and order whole numbers, mixed numbers, fractions, and decimals, using the symbols <, >, =.
- Determine the greatest common factor (GCF) of given numbers.
- Determine the least common multiple (LCM) of given numbers.
- Exponents:
  - Review squares and square roots.
  - Using the terms *squared* and *cubed* and *to the nth power*, read and evaluate numerical expressions with exponents.
  - Review powers of ten.
  - Write numbers in expanded notation using exponents.

Note: See Math 5: Fractions and Decimals; review these topics as needed.

II. Ratio, Percent, and Proportion

A. RATIO AND PROPORTION

- Solve proportions, including word problems involving proportions with one unknown.
- Use ratios and proportions to interpret map scales and scale drawings.
- Set up and solve proportions from similar triangles.
- Understand the justification for solving proportions by cross-multiplication.

B. PERCENT

- Convert between fractions, decimals, and percents.
- Find the given percent of a number, and find what percent a given number is of another number.
- Solve problems involving percent increase and decrease.
- Find an unknown number when a percent of the number is known.
- Use expressions with percents greater than 100% and less than 1%.

III. Computation

A. ADDITION

- Addition, commutative and associative properties: know the names and understand the properties.
  Understand addition and subtraction as inverse operations.
  Add and subtract with integers, fractions and decimals, both positive and negative.

B. MULTIPLICATION

- Commutative, associative, and distributive properties: know the names and understand the properties.
- Multiply multi-digit factors, with and without a calculator.
- Estimate a product.
- Multiply with integers, fractions, and decimals, both positive and negative.
- Distributive property for multiplication over addition or subtraction, that is, A x (B+C) or A x (B-C): understand its use in procedures such as multi-digit multiplication.

C. DIVISION

- Understand multiplication and division as inverse operations.
- Estimate the quotient.
- Divide multi-digit dividends by up to three-digit divisors, with and without a calculator.
- Divide with integers, fractions, or decimals, both positive and negative.

D. SOLVING PROBLEMS AND EQUATIONS

- Solve word problems with multiple steps.
- Solve problems with more than one operation, according to order of operations (with and without a calculator).

IV. Measurement

Teachers: Students should know all information regarding measurement presented in grades 4 and 5; review and reinforce as necessary.

- Solve problems requiring conversion of units within the U. S. Customary System, and within the metric system.
- Associate prefixes used in metric system with quantities:
  kilo = thousand
  hecto = hundred
  deka = ten
  deci = tenth
  centi = hundredth
  milli = thousandth
- Time: solve problems on elapsed time; express parts of an hour in fraction or decimal form.

V. Geometry

- Identify and use signs that mean
  congruent $\cong$
  similar $\sim$
  parallel $\parallel$
  perpendicular $\perp$
- Construct parallel lines and a parallelogram.
- Construct a perpendicular bisector.
- Know that if two lines are parallel, any line perpendicular to one is also perpendicular to the other; and, that two lines perpendicular to the same line are parallel.

- Angles:
  Identify and measure the degrees in angles (review terms: right, acute, obtuse, straight).
  Bisect an angle.
  Construct an angle congruent to a given angle.
  Construct a figure congruent to a given figure, using reflection over a line of symmetry, and identify corresponding parts.
  Show how congruent plane figures can be made to correspond through reflection, rotation, and translation.
- Triangles:
  Know that the sum of the measures of the angles of a triangle is 180°.
  Construct different kinds of triangles.
  Know terms by which we classify kinds of triangles:
  by length of sides: equilateral, isosceles, scalene
  by angles: right, acute, obtuse
- Identify congruent angles and sides, and axes of symmetry, in parallelograms, rhombuses, rectangles, and squares.
- Find the area (A) and perimeter (P) of plane figures, or given the area or perimeter find the missing dimension, using the following formulas:
  rectangle
  $A = lw$
  $P = 2(l + w)$
  square
  $A = s^2$
  $P = 4s$
  triangle
  $A = \frac{1}{2}bh$
  $P = s1 + s2 + s3$
  parallelogram
  $A = bh$
  $P = 2(b + s)$
- Circles:
  Identify arc, chord, radius (plural: radii), and diameter; know that radius = $\frac{1}{2}$ diameter.
  Using a compass, draw circles with a given diameter or radius.
  Solve problems involving application of the formulas for finding the circumference of a circle: $C = \pi d$, and $C = 2\pi r$, using 3.14 as the value of *pi*.
  Find the area of a circle using the formula $A = \pi r^2$
- Find volume of rectangular solids, or given the volume find a missing dimension, using the formulas $V = lwh$, or $V = bh$ (in which b = area of base).

VI. Probability and Statistics

- Find the range and measures of central tendency (mean, median, and mode) of a given set of numbers.
- Understand the differences among the measures of central tendency and when each might be used.
- Understand the use of a sample to estimate a population parameter (such as the mean), and that larger samples provide more stable estimates.
- Represent all possible outcomes of independent compound events in an organized way and determine the theoretical probability of each outcome.
- Compute the probability of any one of a set of disjoint events as the sum of their individual probabilities.
- Solve problems requiring interpretation and application of graphically displayed data.
- Given a set of data, find the mean, median, range, and mode.
- Construct a histogram; a tree diagram.

- Coordinate plane:
  Plot points on a coordinate plane, using ordered pairs of positive and negative whole numbers.
  Use the terms *origin* (0,0), *x-axis*, and, *y-axis*.
  Graph simple functions and solve problems involving use of a coordinate plane.

VII. Pre-Algebra

- Recognize uses of variables and solve linear equations in one variable.
- Solve word problems by assigning variables to unknown quantities, writing appropriate equations, and solving them.
- Find the value for an expression, given replacement values for the variables; for example, what is $7/x - y$ when x is 2 and y is 10?
- Simplify expressions with variables by combining like terms.
- Understand the use of the distributive property in variable expressions such as $2x(2y+3)$.

Science: Grade 6

Teachers: Effective instruction in science requires not only hands-on experience and observation but also book learning, which helps bring coherence and order to a student's scientific knowledge. Only when topics are presented systematically and clearly can students make steady and secure progress in their scientific learning. The Science sequence for the middle school grades aims for more intensive and selective study of topics, a number of which were introduced in earlier grades. It also continues the practice of studying topics from each of the major realms of science (physical, life, and earth science). Students are expected to do experiments and write reports on their findings.

I. Plate Tectonics

- The surface of the earth
  - The surface of the earth is in constant movement.
  - The present features of earth come from its ongoing history. After the sun was formed, matter cooled creating the planets. The continents were once joined (Pangaea).
- Layered structure of the earth
  - Crust: surface layer of mainly basalt or granite, 5 to 25 miles thick
  - Mantle: 1,800 miles thick, rock of intermediate density, moves very slowly
  - Outer core: liquid iron and nickel
  - Inner core: solid iron and nickel, 800 miles thick, about 7,000 degrees C
- Crust movements
  - The surface of earth is made up of rigid plates that are in constant motion.
  - Plates move because molten rock rises and falls under the crust causing slowly flowing currents under the plates.
  - Plates move at speeds ranging from 1 to 4 inches (5-10 centimeters) per year.
  - Earthquakes usually occur where stress has been built up by plates moving in opposite directions against each other. Earthquakes cause waves (vibrations) which have:
    - focus, the point below the surface where the quake begins
    - epicenter, the point on the surface above the focus
  - Severity of ground shaking is measured on the Richter scale; each unit on the scale represents a tenfold severity increase
- Volcanoes usually occur where plates are pulling apart or coming together, but some occur at holes (hot spots) in the crust away from plate boundaries. As plates move over these hot spots, they cause chains of volcanoes and island chains like the Hawaiian Islands.
- Evidence for long-term movement of plates includes fit of continents and matches of rock types, fossils, and structures; ocean floor age and topography; ancient climate zones; locations of earthquakes, volcanoes, and mountain ranges; magnetic directions in ancient rocks.

II. Oceans

- Surface
  - The world ocean covers most of the earth's surface (71 per cent).
  - Three major subdivisions of the world ocean: Atlantic, Pacific,and Indian Oceans
  - Islands consist of high parts of submerged continents, volcanic peaks, coral atolls.
- Subsurface land features
  - Continental shelf, continental slope, continental rise, abyssal plains
  - Mid-ocean ridges and trenches, plate tectonics
    - Mid-Atlantic Ridge, Mariana Trench
- Ocean bottom: average depth of sediment .3 mile, consists of rock particles and organic remains
- Composition of seawater: dilute solution of salts which come from weathering and erosion of continental rocks.
  - Sodium chloride is the main salt.

- Currents, tides, and waves
  - Surface currents: large circular streams kept in motion by prevailing winds and rotation of the earth; Gulf Stream (North Atlantic), Kuroshio (North Pacific)
  - Subsurface currents are caused by upwelling from prevailing offshore winds (Peru, Chile) and density differences (Antarctica); the upwelling pushes up nutrients from the ocean floor.
  - Tides are caused by gravitational forces of the sun and moon; there are two tides daily.
  - Waves are caused by wind on the ocean's surface.
    - Water molecules tend to move up and down in place and not move with the wave.
    - Crest and trough, wave height and wavelength, shoreline friction
    - Tsunamis: destructive, fast-moving large waves caused mainly by earthquakes
- Marine life
  - Life zones are determined by the depth to which light can penetrate making photosynthesis possible, and by the availability of nutrients.
    - The bottom (benthic zone) extends from sunlit continental shelf to dark sparsely populated depths. Shallow lighted water extending over continental shelf contains 90% of marine species.
    - Pelagic zone: water in open oceans
  - Classification of marine life
    - Bottom-living (benthic) such as kelp and mollusks
    - Free-swimming (nekton) such as fish and whales
    - Small drifting plants and animals (plankton), which are the dominant life and food source of the ocean
  - The basis for most marine life is phytoplankton (plant-plankton), which carry on photosynthesis near surface; contrast zooplankton (animal plankton).
  - Most deepwater life depends on rain of organic matter from above. The densest concentration of marine life is found in surface waters, such as those off Chile, where nutrient-rich water wells up to the bright surface.

III. Astronomy: Gravity, Stars, and Galaxies

- Gravity: an attractive force between objects
  - Newton's law of universal gravitation: Between any two objects in the universe there is an attractive force, gravity, which grows greater as the objects move closer to each other.
  - How gravity keeps the planets in orbit

See below, Energy: Nuclear energy, *re* Stars.

- Stars
  - The sun is a star.
  - Kinds of stars (by size): giants, dwarfs, pulsars
  - Supernova; black holes
  - Apparent movement of stars caused by rotation of the earth
  - Constellations: visual groupings of stars, for example, Big Dipper, Orion
  - Astronomical distance measured in light years
- Galaxies
  - The Milky Way is our galaxy; the Andromeda Galaxy is closest to the Milky Way.
  - Quasars are the most distant visible objects (because the brightest).

IV. Energy, Heat, and Energy Transfer

A. ENERGY

- Six forms of energy: mechanical, heat, electrical, wave, chemical, nuclear
- The many forms of energy are interchangeable, for example, gasoline in a car, windmills, hydroelectric plants.
- Sources of energy: for example, heat (coal, natural gas, solar, atomic, geothermal, and thermonuclear), mechanical motion (such as falling water, wind)

- Fossil fuels: a finite resource
  - Carbon, coal, oil, natural gas
  - Environmental impact of fossil fuels: carbon dioxide and global warming theory, greenhouse effect, oil spills, acid rain
- Nuclear energy
  - Uranium, fission, nuclear reactor, radioactive waste
  - Nuclear power plants: safety and accidents (for example, Three Mile Island, Chernobyl)

B. HEAT

- Heat and temperature: how vigorously atoms are moving and colliding
- Three ways that heat energy can be transferred: conduction, convection, radiation
  - The direction of heat transfer

C. PHYSICAL CHANGE: ENERGY TRANSFER

- States of matter (solid, liquid, gas) in terms of molecular motion
  - In gases, loosely packed atoms and molecules move independently and collide often. Volume and shape change readily.
  - In liquids, atoms and molecules are more loosely packed than in solids and can move past each other. Liquids change shape readily but resist change in volume.
  - In solids, atoms and molecules are more tightly packed and can only vibrate. Solids resist change in shape and volume.
- Most substances are solid at low temperatures, liquid at medium temperatures, and gaseous at high temperatures.
- A change of phase is a physical change (no new substance is produced).
- Matter can be made to change phases by adding or removing energy.
- Expansion and contraction
  - Expansion is adding heat energy to a substance, which causes the molecules to move more quickly and the substance to expand.
  - Contraction is when a substance loses heat energy, the molecules slow down, and the substance contracts.
  - Water as a special case: water expands when it changes from a liquid to a solid.
- Changing phases: condensation; freezing; melting; boiling
  - Different amounts of energy are required to change the phase of different substances.
  - Each substance has its own melting and boiling point.
  - The freezing point and boiling point of water (in degrees Celsius and Fahrenheit)
- Distillation: separation of mixtures of liquids with different boiling points.

V. The Human Body

Note: See Science 5 for the human reproductive system. There is some flexibility in the grade-level placement of the study of topics relating to human reproduction, as different schools and districts have differing local requirements, typically introducing these topics in either fifth or sixth grade.

- The circulatory and lymphatic systems
  - Briefly review from grade 4: circulatory system
  - Lymph, lymph nodes, white cells, tonsils
  - Blood pressure, hardening and clogging of arteries
- The immune system fights infections from bacteria, viruses, fungi.
  - White cells, antibodies, antigens
  - Vaccines, communicable and non-communicable diseases, epidemics
  - Bacterial diseases: tetanus, typhoid, tuberculosis; antibiotics like penicillin, discovered by Alexander Fleming
  - Viral diseases: common cold, chicken pox, mononucleosis, rabies, polio, AIDS

VI. Science Biographies

See above, Plate Tectonics *re* Wegener; Energy *re* Curie; Astronomy, Gravity, *re* Newton. See also World History 6, The Enlightenment, *re* Newton.

Marie Curie (advances in science of radioactivity; discovered the elements polonium and radium)

Lewis Howard Latimer (worked with Alexander Graham Bell on drawings of Bell's invention, the telephone; improved Thomas Edison's light bulb)

Isaac Newton (known for advances in physics; outlined laws of gravity and invented the telescope)

Alfred Wegener (known for theory that the continents were once joined together and split apart to form the continents; now known as "the continental drift")