

United States Academic Pentathlon 2016-17 **Curriculum and Content Standards**

Overview

The United States Academic Pentathlon’s curriculum is an interdisciplinary curriculum in which a selected theme is integrated across five different subject areas: fine arts, literature, mathematics, science, and social science. The theme for the 2016–2017 U.S. Academic Pentathlon curriculum is *World War II*. While in most subjects the majority of the topics relate to the overall curricular theme, some topics that cover fundamentals may also be included to encourage a thorough understanding of the subject area as a whole. The U.S. Academic Pentathlon mathematics curriculum is unrelated to the theme and focuses on standard middle school mathematics topics.

Fine Arts

U.S. Academic Pentathlon and the National Standards for Music

U.S. Academic Pentathlon’s curriculum allows students and teachers to address four of the nine content standards for music. The five standards that are not met all involve the performance, composition, or notation of music. U.S. Academic Pentathlon’s music curriculum is centered on musicology (as opposed to composition or performance) and is designed to be accessible to all students, including those who cannot read musical notation and those who have no formal training in musical performance.

U.S. Academic Pentathlon’s 2016–2017 music curriculum addresses aspects of the following national content standards for music:

- STANDARD 6: Listening to, Analyzing, and Describing Music
- STANDARD 7: Evaluating Music and Music Performances
- STANDARD 8: Understanding Relationships between Music, the Other Arts, and Disciplines outside the Arts
- STANDARD 9: Understanding Music in Relation to History and Culture

U.S. Academic Pentathlon’s and the National Standards for Visual Arts

U.S. Academic Pentathlon’s curriculum allows students and teachers to address five of the six content standards for visual arts. The only standard not directly met by U.S. Academic Pentathlon’s curriculum (Standard 1: Understanding and Applying Media Techniques and Processes), can easily be incorporated as a part of U.S. Academic Pentathlon’s curriculum by having students create their own works of art in addition to studying the works of others.

U.S. Academic Pentathlon's 2016–2017 art curriculum addresses aspects of the following national content standards for visual arts:

- STANDARD 2: Using Knowledge of Structures and Functions
- STANDARD 3: Choosing and Evaluating a Range of Subject Matter, Symbols, and Ideas
- STANDARD 4: Understanding the Visual Arts in Relation to History and Cultures
- STANDARD 5: Reflecting Upon and Assessing the Characteristics and Merits of their Work and the Work of Others
- STANDARD 6: Making Connections between Visual Arts and Other Disciplines

Literature

Number the Stars and Selected Literature

United States Academic Pentathlon 2016-2017 Literature Resource Guide correlation with Common Core State Standards (CCSS) and The National Council of Teachers of English (NCTE) standards

Selected Literature of the World War II Era

The literary choices for the 2016-2017 Academic Pentathlon require students to work through a number of CCSS standards for both informational and fictional texts. In addition, in Section II, the background information falls under the literacy standards for social studies. Specific relevant standards are listed by sections which correlate to this year's literature resource guide. All of these standards additionally fall under the first **three NCTE standards**:

1. Students read a wide range of print and non-print texts to build an understanding of texts, of themselves, and of the cultures of the United States and the world; to acquire new information; to respond to the needs and demands of society and the workplace; and for personal fulfillment. Among these texts are fiction and nonfiction, classic and contemporary works.
2. Students read a wide range of literature from many periods in many genres to build an understanding of the many dimensions (e.g., philosophical, ethical, aesthetic) of human experience.
3. Students apply a wide range of strategies to comprehend, interpret, evaluate, and appreciate texts. They draw on their prior experience, their interactions with other readers and writers, their knowledge of word meaning and of other texts, their word identification strategies, and their understanding of textual features (e.g., sound-letter correspondence, sentence structure, context, graphics).

Section I Critical Reading

This section addresses and assesses numerous skills under CCSS (Please note, even though these standards are the sixth grade standards, the same apply at grades 7 and 8):

Craft and Structure:

- CCSS.ELA-LITERACY.RL.6.4 Determine the meaning of words and phrases as they are used in a text, including figurative and connotative meanings; analyze the impact of a specific word choice on meaning and tone
- CCSS.ELA-LITERACY.RL.6.5 Analyze how a particular sentence, chapter, scene, or stanza fits into the overall structure of a text and contributes to the development of the theme, setting, or plot.
- CCSS.ELA-LITERACY.RL.6.6 Explain how an author develops the point of view of the narrator or speaker in a text.

Section II Theme: World War II

The background information in this sections addresses the literacy standards for social studies:

Key Ideas and Details:

- CCSS.ELA-LITERACY.RH.6-8.1 Cite specific textual evidence to support analysis of primary and secondary sources.
- CCSS.ELA-LITERACY.RH.6-8.2 Determine the central ideas or information of a primary or secondary source; provide an accurate summary of the source distinct from prior knowledge or opinions.

Craft and Structure:

- CCSS.ELA-LITERACY.RH.6-8.4 Determine the meaning of words and phrases as they are used in a text, including vocabulary specific to domains related to history/social studies.

Integration of Knowledge and Ideas:

- CCSS.ELA-LITERACY.RH.6-8.7 Integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts.

Section 3 Novel: Number the Stars by Lois Lowry

Range of Reading and Level of Text Complexity:

- CCSS.ELA-LITERACY.RL.8.10 By the end of the year, read and comprehend literature, including stories, dramas, and poems, at the high end of grades 6-8 text complexity band independently and proficiently.

Additionally, these standards are also addressed through the analysis tasks throughout the work:

Key Ideas and Details:

- CCSS.ELA-LITERACY.RL.6.1 Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.
- CCSS.ELA-LITERACY.RL.6.2 Determine a theme or central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.
- CCSS.ELA-LITERACY.RL.6.3 Describe how a particular story's or drama's plot unfolds in a series of episodes as well as how the characters respond or change as the plot moves toward a resolution.

Section IV Shorter Selections: Prose

Range of Reading and Level of Text Complexity:

- CCSS.ELA-LITERACY.RI.8.10 By the end of the year, read and comprehend literary nonfiction at the high end of the grades 6-8 text complexity band independently and proficiently.

Key Ideas and Details:

- CCSS.ELA-LITERACY.RI.8.2 Determine a central idea of a text and analyze its development over the course of the text, including its relationship to supporting ideas; provide an objective summary of the text.

Craft and Structure:

- CCSS.ELA-LITERACY.RI.8.4 Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of specific word choices on meaning and tone, including analogies or allusions to other texts.
- CCSS.ELA-LITERACY.RI.8.5 Analyze in detail the structure of a specific paragraph in a text, including the role of particular sentences in developing and refining a key concept.

Section V Shorter Selections: Poetry

Craft and Structure:

- CCSS.ELA-LITERACY.RL.8.4 Determine the meaning of words and phrases as they are used in a text, including figurative and connotative meanings; analyze the impact of specific word choices on meaning and tone, including analogies or allusions to other texts.
- CCSS.ELA-LITERACY.RL.8.5 Compare and contrast the structure of two or more texts and analyze how the differing structure of each text contributes to its meaning and style.

Range of Reading and Level of Text Complexity:

- CCSS.ELA-LITERACY.RL.8.10 By the end of the year, read and comprehend literature, including stories, dramas, and poems, at the high end of grades 6-8 text complexity band independently and proficiently.

Mathematics

U.S. Academic Pentathlon's 2016–2017 mathematics curriculum addresses the following aspects of the Common Core Standards:

Common Core Standards for Grade 6:

- CCSS.Math.Content.6.RP.A.3.b Solve unit rate problems including those involving unit pricing and constant speed.
- CCSS.Math.Content.6.RP.A.3.c Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means $30/100$ times the quantity); solve problems involving finding the whole, given a part and the percent.
- CCSS.Math.Content.6.NS.B.4 Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1-100 with a common factor as a multiple of a sum of two whole numbers with no common factor.
- CCSS.Math.Content.6.NS.C.6.b Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.
- CCSS.Math.Content.6.NS.C.7.a Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram.
- CCSS.Math.Content.6.NS.C.7.b Write, interpret, and explain statements of order for rational numbers in real-world contexts.
- CCSS.Math.Content.6.NS.C.8 Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.
- CCSS.Math.Content.6.EE.A.1 Write and evaluate numerical expressions involving whole-number exponents.
- CCSS.Math.Content.6.EE.A.2 Write, read, and evaluate expressions in which letters stand for numbers.
- CCSS.Math.Content.6.EE.A.2.a Write expressions that record operations with numbers and with letters standing for numbers.

- CCSS.Math.Content.6.EE.A.2.b Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity.
- CCSS.Math.Content.6.EE.A.2.c Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).
- CCSS.Math.Content.6.EE.A.3 Apply the properties of operations to generate equivalent expressions.
- CCSS.Math.Content.6.EE.A.4 Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them).
- CCSS.Math.Content.6.EE.B.5 Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.
- CCSS.Math.Content.6.EE.B.6 Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.
- CCSS.Math.Content.6.EE.B.7 Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p , q and x are all nonnegative rational numbers.
- CCSS.Math.Content.6.EE.B.8 Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.
- CCSS.Math.Content.6.EE.C.9 Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation $d = 65t$ to represent the relationship between distance and time.
- CCSS.Math.Content.6.G.A.1 Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.

Common Core Standards for Grade 7:

- CCSS.Math.Content.7.RP.A.2 Recognize and represent proportional relationships between quantities.
- CCSS.Math.Content.7.RP.A.2.a Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.
- CCSS.Math.Content.7.RP.A.3 Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.
- CCSS.Math.Content.7.EE.A.1 Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
- CCSS.Math.Content.7.EE.A.2 Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related.
- CCSS.Math.Content.7.EE.B.3 Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.
- CCSS.Math.Content.7.EE.B.4 Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.
- CCSS.Math.Content.7.EE.B.4.a Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p , q , and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach.
- CCSS.Math.Content.7.EE.B.4.b Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p , q , and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem.
- CCSS.Math.Content.7.G.B.5 Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.
- CCSS.Math.Content.7.G.B.6 Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

Common Core Standards for Grade 8:

- CCSS.Math.Content.8.EE.A.1 Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.

- CCSS.Math.Content.8.EE.A.2 Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.
- CCSS.Math.Content.8.EE.A.3 Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other.
- CCSS.Math.Content.8.EE.A.4 Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology
- CCSS.Math.Content.8.EE.B.5 Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.
- CCSS.Math.Content.8.EE.B.6 Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b .
- CCSS.Math.Content.8.EE.C.7 Solve linear equations in one variable.
- CCSS.Math.Content.8.F.A.1 Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.1
- CCSS.Math.Content.8.F.A.2 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).
- CCSS.Math.Content.8.F.A.3 Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear.
- CCSS.Math.Content.8.F.B.4 Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.
- CCSS.Math.Content.8.F.B.5 Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.
- CCSS.Math.Content.8.G.A.5 Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.

- CCSS.Math.Content.8.G.B.6 Explain a proof of the Pythagorean Theorem and its converse.
- CCSS.Math.Content.8.G.B.7 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
- CCSS.Math.Content.8.G.B.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.

Science

Next Generation Science Standards: Middle School Physical Science – Disciplinary Core Ideas

MS-PS1: Matter and Its Interactions

- PS1.A: Structure and Properties of Matter
 - Substances are made from different types of atoms, which combine with one another in various ways. Atoms form molecules that range in size from two to thousands of atoms.
- PS1.B: Chemical Reactions
 - Substances react chemically in characteristic ways. In a chemical process, the atoms that make up the original substances are regrouped into different molecules, and these new substances have different properties from those of the reactants.

MS-PS2: Motion and Stability: Forces and Interactions

- PS2.B: Types of Interactions
 - Electric and magnetic (electromagnetic) forces can be attractive or repulsive, and their sizes depend on the magnitudes of the charges, currents, or magnetic strengths involved and on the distances between the interacting objects.
 - Forces that act at a distance (electric, magnetic, and gravitational) can be explained by fields that extend through space and can be mapped by their effect on a test object (a charged object, or a ball, respectively).

MS-PS3: Energy

- PS3.A: Definitions of Energy
 - Motion energy is properly called kinetic energy; it is proportional to the mass of the moving object and grows with the square of its speed.
 - A system of objects may also contain stored (potential) energy, depending on their relative positions.
- PS3.B: Conservation of Energy and Energy Transfer
 - When the motion energy of an object changes, there is inevitably some other change in energy at the same time.

- PS3.C: Relationship Between Energy and Forces
 - When two objects interact, each one exerts a force on the other that can cause energy to be transferred to or from the object.

PS4: Waves and Their Applications in Technologies for Information Transfer

- PS4.A: Wave Properties
 - A simple wave has a repeating pattern with a specific wavelength, frequency, and amplitude.
- PS4.B: Electromagnetic Waves
 - The path that light travels can be traced as straight lines, except at surfaces between different transparent materials (e.g., air and water, air and glass) where the light path bends.
 - A wave model of light is useful for explaining brightness, color, and the frequency-dependent bending of light at a surface between media.
 - However, because light can travel through space, it cannot be a matter wave, like sound or water waves.

NGSS Science and Engineering Practices

Practice 2: Developing and Using Models

- Develop a model to predict and/or describe phenomena.
- Develop a model to describe unobservable mechanisms.

Practice 4: Analyzing and Interpreting Data

- Analyze and interpret data to determine similarities and differences in findings.
- Analyze and interpret data to provide evidence for phenomena.
- Construct and interpret graphical displays of data to identify linear and nonlinear relationships.

Practice 5: Using Mathematics and Computational Thinking

- Use mathematical representations to describe and/or support scientific conclusions and design solutions.

NGSS Understandings About the Nature of Science

Scientific Investigations Use a Variety of Methods

- Science investigations use a variety of methods and tools to make measurements and observations.
- Science depends on evaluating proposed explanations.

Scientific Knowledge is Based on Empirical Evidence

- Science knowledge is based upon logical and conceptual connections between evidence and explanations.

Scientific Knowledge is Open to Revision in Light of New Evidence

- Scientific explanations are subject to revision and improvement in light of new evidence.
- The certainty and durability of science findings varies.
- Science findings are frequently revised and/or reinterpreted based on new evidence

Science Models, Laws, Mechanisms, and Theories Explain Natural Phenomena

- Theories are explanations for observable phenomena.
- Science theories are based on a body of evidence developed over time.
- Laws are regularities or mathematical descriptions of natural phenomena.
- A hypothesis is used by scientists as an idea that may contribute important new knowledge for the evaluation of a scientific theory.

Science is a Way of Knowing

- Science knowledge is cumulative and many people, from many generations and nations, have contributed to science knowledge.

Scientific Knowledge Assumes an Order and Consistency in Natural Systems

- Science assumes that objects and events in natural systems occur in consistent patterns that are understandable through measurement and observation.
- Science carefully considers and evaluates anomalies in data and evidence.

Science is a Human Endeavor

- Men and women from different social, cultural, and ethnic backgrounds work as scientists and engineers.
- Scientists and engineers are guided by habits of mind such as intellectual honesty, tolerance of ambiguity, skepticism and openness to new ideas.
- Advances in technology influence the progress of science and science has influenced advances in technology.

Science Addresses Questions About the Natural and Material World

- Science knowledge can describe consequences of actions but is not responsible for society's decisions.

Social Science

Standards Background

The Curriculum Standards for Social Studies were developed by a Task Force of the National Council for the Social Studies (NCSS) and approved by the NCSS Board of Directors in April 1994 and revised in 2010. The NCSS standards focus on ten overarching themes, and the content standards include aspects of several different fields of study, including civics, geography, U.S. history, and world history.

U.S. Academic Pentathlon and the Curriculum Standards for Social Studies

Rather than cover a broad spectrum of topics, time periods, and cultures, U.S. Academic Pentathlon's social science curriculum explores a specific topic in greater depth than is typical for a middle school-level curriculum. As a result, the number of the NCSS standards that are addressed each year by U.S. Academic Pentathlon's social science curriculum may be limited; however, when viewed over the course of several years, U.S. Academic Pentathlon's social science curricula have met many of the NCSS standards.

U.S. Academic Pentathlon's 2016–2017 social science curriculum in concert with other subject areas addresses aspects of seven of the ten NCSS curricular themes:

- *Culture*
- *Time, Continuity, and Change*
- *People, Places, and Environments*
- *Individuals, Groups, and Institutions*
- *Power, Authority, and Governance*
- *Production, Distribution, and Consumption*
- *Global Connections*

The U.S. Academic Decathlon's 2016–2017 curriculum addresses aspects of the standards within the following eras of focus delineated by the NCSS standards for United States History and World History for Grades 5–12:

- *U.S. History: NSS-USH.5-12.7 – Era 7: The Emergence of Modern America (1890–1930)*
- *U.S. History: NSS-USH.5-12.8 – Era 8: The Great Depression and World War II (1929–1945)*
- *U.S. History: NSS-USH.5-12.9 – Era 9: Postwar United States (1945 to Early 1970s)*
- *World History: NSS-WH.5-12.8 – Era 8: A Half-Century of Crisis and Achievement, 1900–1945*

Source List

Common Core State Standards Initiative. 9 September 2016 <<http://www.corestandards.org/>>.

“National Curriculum Standards for Social Studies.” National Council for the Social Studies. 21 September 2016 <<http://www.socialstudies.org/standards/strands>>.

“Next Generation Science Standards: For States, By States.” 16 August 2016 <<http://www.nextgenscience.org/>>.

“Next Generation Science Standards.” National Science Teachers Association. 16 August 2016 <<http://www.nsta.org/about/standardsupdate/>>.

“Standards for the English Language Arts.” The National Council of Teachers of English. 21 September 2016 <<http://www.ncte.org/standards/ncte-ira>>.

“Standards for the Performing and Visual Arts for Grades 5-8.” The Kennedy Center: ArtsEdge. 21 September 2016 <<http://artsedge.kennedy-center.org/educators/standards/full-text/5-8-standards>>.