



# NATIONAL ACADEMIC PENTATHLON

# 2012 SEVENTH GRADE STUDY GUIDE



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**COACHES:** For local  
competition information, please  
call your County Office of Education



**W**elcome to the Academic Pentathlon program for middle school students. We're proud to have you on board and look forward to an exciting year.

The Academic Pentathlon is a rapidly growing program, both in Orange County and nationwide. With teamwork and cooperative learning as the focus, the Academic Pentathlon program has excited both teachers and students. Most schools organize the program as an on-campus academic club where students of all ability levels have the opportunity to interact and learn. The program empowers schools to reinforce positive attitudes towards learning and provides a "safe" environment for academically motivated students.

The benefits associated with Pentathlon participation are extensive. The knowledge gained, the cooperative skills developed, and the memories of deep friendships are experiences that will continue to have positive influences on the students long after the competition. In addition, the Academic Pentathlon is based on the California state content standards, making it a perfect complement to traditional school year curriculum.

Your commitment to give of your time, leadership, and caring is a special tribute to your profession. It is the most precious gift that we can bestow on future generations.

Best wishes as you begin to prepare your teams for the 2012 Pentathlon.

William M. Habermehl  
County Superintendent of Schools



## Welcome, Coaches, to another exciting year!

On behalf of the Orange County Department of Education, it is my pleasure to welcome your participation in this year's Academic Pentathlon program.

The goals of the program are to:

- Maximize the individual learning potential of adolescent students through the motivation of teamwork and competitive challenge
- Provide schools with a vehicle to focus on and reward the academic efforts and achievements of their students
- Stimulate interaction of schools, communities, and businesses in support of academic endeavor

The Academic Pentathlon is an exciting one-day, five-event academic competition. After weeks of academic coaching, team studying, and individual preparation, Pentathletes gather on competition day to test their knowledge in Essay writing, Literature, Mathematics, Science, and Social Science.

- The competition begins with 30-minute written exams in four subject areas. The culminating event of the competition is the Super Quiz, which is the only event open to the public.
- The Super Quiz topic can be either Social Science or Science. Super Quiz is held in the gym with the questions projected on a large screen. Team members are brought together to compete in a battle of wits against other participating teams. It is an exciting and challenging event before a cheering crowd of parents, students, and supporters.
- Each team is composed of nine team members, three from each grade point average category of "A," "B," and "C or below." This team composition gives students the opportunity to develop skills for working with students of different ability levels, motivation, and interests.

Regardless of how your team scores at the competition, each participant benefits from the program. The time spent growing, nurturing, and enjoying each other is the real reward of the competition training. The Pentathletes' awareness and appreciation for team members' diversity reaffirm the importance of requiring team membership to include students from the "A," "B," and "C and below" grade point average categories.

This Study Guide is divided into five sections, covering the test areas of the Academic Pentathlon. Please feel free to call our Academic Events office at (714) 966-4316 if you have any questions about the Study Guide or the competition format.

Sincerely,  
Sharon L. Nelson  
Coordinator, Academic Events



# ACADEMIC PENTATHLON HISTORY

The concept of academic competitions as a motivator was pioneered by Dr. Robert Peterson, Orange County Superintendent of Schools, emeritus. In 1968, he created the Academic Decathlon, a ten-event competition for students in grades nine through twelve.

Schools quickly discovered that spirit, excitement, and enthusiasm should not be reserved just for student athletes. The applause, cheering, and enthusiastic recognition given to athletic superstars belong just as much to outstanding academic performers. The possibility of being publicly recognized for academic achievement gives students new motivation to strive for excellence.

The Academic Pentathlon brings such recognition within the reach of students in grades six through eight. In 1984, a pilot competition was held for six teams of eighth grade students from Orange County, California. With financial support from the McKesson Foundation, a full Academic Pentathlon program was launched in 1985. That year, 440 students from 56 schools participated. In 2011, over 1,800 students from 207 teams participated in Orange County, California alone, and more than 6,500 awards were distributed. The SchoolsFirst Federal Credit Union has been the primary sponsor since 1988.

With the combined support of corporate partners and the growing enthusiasm of teachers, students, administrators, and parents, the Academic Pentathlon has expanded to 17 California counties and various other states. The future holds bright promise for continued expansion of this program as schools come to appreciate its value in encouraging and fostering academic excellence in the middle schools.

During the three months of training, students develop a deep camaraderie and appreciation for their team members. Once they have shared the rich experiences of working as a cooperative group, they become more effective leaders as well as team players. They come to appreciate the value and power of teamwork.



# **BENEFITS OF THE ACADEMIC PENTATHLON**

## **RECOGNITION FOR ACADEMIC ACHIEVEMENTS**

Athletic achievers have long received the praise of peers, admiration of their teachers, and support of their community. The Academic Pentathlon enlarges this sense of school spirit and student pride by recognizing and rewarding students for academic achievement.

## **PARTICIPATION OF ALL STUDENTS**

Students of all achievement levels—above, at, or below grade level—are eligible to compete in the Academic Pentathlon. By opening the competition to every student in the school, underachievers are given the motivation to learn and the opportunity to try. High achievers, motivated by a strong desire to succeed, participate in the competition with contagious enthusiasm.

## **COOPERATION TO MAXIMIZE LEARNING**

Teamwork is at the heart of the Academic Pentathlon. Students in their middle school years feel a strong need for peer approval and support. By helping each other prepare for the competition, Pentathletes help bring out the potential in each other. The Academic Pentathlon teaches students to appreciate different styles of learning, interests, and talents, and it enhances their ability to work as a team.

## **INTERACTION WITH SCHOOL/COMMUNITY**

The competition provides recognition outside the classroom for caring and motivated teachers, bringing a high degree of visibility to participating schools. Civic groups and local businesses become enthusiastic supporters through their sponsorship of the program.

Everyone touched by the Academic Pentathlon—students, coaches, businesses, community leaders, parents, sponsors, and volunteers all gain feelings of pride, achievement, and satisfaction by contributing to the academic and personal excellence of tomorrow's leaders.

## **IMMEDIATE BENEFITS**

The special blend of education and competition offered by the Academic Pentathlon enables Pentathletes to:

- Meet California Standards
- Improve research, study, and test-taking skills
- Enhance communications, interpersonal, and team building skills
- Develop critical thinking skills, self-discipline, and commitment
- Grow in appreciation for academic challenge, endeavor, and inquiry
- Gain a greater sense of self esteem and pride in achievements



# PENTATHLON EVENTS

The events for the 2012 Academic Pentathlon are designed to test general knowledge as well as written communication skills. The number in the parentheses indicates the number of test questions in that subject. Super Quiz includes a 25-item objective test for all students and a 10-item oral round per Honor, Scholastic, and Varsity category. The objective and oral tests will be worth 500 points each.

	<b><u>Possible Individual Points</u></b>
ESSAY (two-page white, lined paper)	1,000
LITERATURE (50)	1,000
MATHEMATICS (30)	1,000
SOCIAL SCIENCE - SUPER QUIZ* Objective Test (25) Relay Round (10)	1,000 (separate team award only)
SCIENCE (50)	1,000
<b>TOTAL POINTS</b>	<b><u>5,000</u></b>

\*30 minutes allotted for each test except Super Quiz relay round



# STUDY GUIDE FORMAT

Each objective test in the Academic Pentathlon consists of a total of 50 questions (except math with 30 questions) in two formats: multiple choice and matching. Super Quiz contains 10 items for the oral round and 25 items for the objective test. The essay will be based on a choice of one of three prompts. Sample instructions and prompts are included in the Study Guide.

Keep in mind that the intent of the program is to recognize students in a positive way. If they take the time to learn the material, use good test-taking skills, and apply their knowledge, we hope they will be successful. We recognize that students have a limited time to learn the material, so parameters have been set for the content.

In order to help contestants and coaches plan an effective study program for the Academic Pentathlon, this Study Guide outlines the information that will be covered by each test. In most cases, the major subject headings are followed by detailed listings of subtopics to study.

## MESOAMERICAN AND ANDEAN CIVILIZATION

- 11%    **I. GEOGRAPHY**
- A. Topography
  - B. Present day countries in each region
  - C. Major climates and patterns of each region
  - D. Geographic terms

The subtopics following this major subject heading explain what students should know about the Mesoamerican geography. Approximately 11 percent of the test will cover roman numeral one.

EXAMPLE



# ESSAY

## ESSAY WRITING INSTRUCTIONS

### Before You Write:

- Select one of the prompts from the ones listed on the next page.
- Use the colored sheet stapled to your essay paper to outline your ideas. Use the white, lined paper to write your essay. Only the two-page white, lined paper will be scored.

### Mechanics of Your Paper:

- Write in pencil only and use legible penmanship.
- Follow accepted rules of Standard English sentence structure, usage, spelling, capitalization, and punctuation.
- Write a carefully organized essay of no more than two pages in length.
- Include adequate transitions between ideas.
- Write a final, concluding paragraph.
- Allow time to proofread and correct your essay.

### The Essay:

- Write the quotation or prompt on your paper.
- Support your position with specific details, facts, or examples drawn from your reading or from your own experience.



# ESSAY

## 7<sup>TH</sup> GRADE SAMPLE ESSAY PROMPTS

(The enclosed quotations are to be used as practice writing prompts. You can have your coaches practice with their team using these quotations.)

The 2012 Academic Pentathlon Essay prompts will be taken from the literature selection, *Phoenix Rising* by Karen Hesse and the Social Science topic, *Expansion and Disintegration of the Roman Empire*.

1. Karen Hesse has very strong opinions about nuclear power plants. In what way are these opinions evident in the book, "*Phoenix Rising*?"
2. "*I feel like that bird, the Phoenix. It burns up, then rises from its ashes.*" How does this quotation reflect the theme of the book?
3. Many problems threatened the Roman Empire. What led to one emperor dividing the empire in half?

SAMPLE



# LITERATURE

## Phoenix Rising

by Karen Hesse

*Phoenix Rising* is about a nuclear catastrophe at the Cookshire power plant. Gran and thirteen year old Nyle take two evacuees to live with them temporarily on their sheep farm. The refugees are Mrs. Miriam Trent, whose husband died in the incident, and her fifteen year old son, Ezra, who is suffering from severe radiation sickness. Nyle has previously suffered losses of family members due to desertion and death, and she resists involvement with the two guests. Gran's few but firm principles help Nyle to offer gentle acts of kindness which, in turn, transform Nyle as she learns to embrace each living moment.

The student, in his analysis of the novel, should be aware of the grade level standards. They should be able to read critically while reflecting on the characterization development, the setting and the plot. Some questions will expect the students to interpret quotations as related to the plot, theme, characterization, historical relevance and the author's use of literary devices.

### 10 % POETRY

Students should be prepared to demonstrate the ability to analyze how the author develops the poem's tone and central idea.

- A. Define how tone or mood is conveyed in poetry through word choice, figurative language, sentence structure, line length, punctuation, rhythm, repetition, and rhyme
- B. They should be able to recognize how literary devices (such as alliteration, imagery, personification, repetition, etc.) are used to emphasize mood and meaning.

### 20% LANGUAGE

Students should be prepared to answer questions that demonstrate mastery of grade level standards in language usage and conventions: sentence structure, grammar, punctuation, and spelling.



# LITERATURE

## 15% VOCABULARY

The words will be chosen from the novel and the poetry. Correct usage of vocabulary through the analysis of context clues and the interpretation of the text lead to a better understanding of the author's purpose.

## 55% NOVEL

**Questions in this section will be an in-depth analysis of the literature selection.**

### A. Setting

1. What is the setting?
2. How does the setting provide a background for the development of plot events and conflicts among characters?

### B. Plot, Events, Action

1. What is the structure of the literature?
2. How does the author develop plot through conflict, tension, climax, and resolution?

### C. Character, Characterization

1. How does the author develop the central conflict of the protagonists?
2. How are other characters used to develop a theme?
3. How do minor characters represent attitudes, life style, and social conditions?

### D. Theme and / or historical background

1. How are themes developed through the central conflicts of the characters?
2. Is historical reference incorporated into the literature?

### E. Style, Point of View, Tone

1. How does the point of view affect the tone of the literature?
2. How do characterization, plot development, and literary devices contribute to the mood and theme?

### F. Quotations

1. How do certain quotes used in the novel relate to the mood, theme, plot, etc.?

### G. Sequencing of events

#### 1. What order to certain events take place in the novel?

### H. Literary devices (foreshadowing, flashbacks, metaphor, symbolism, dialect, irony, imagery)



# LITERATURE

## POEMS

### Sample Test

*"Anything Can Happen"*

by Shel Silverstein

### Marketing Test

*"The Smile Virus"*

by Russell H. Conwell

### County Test

*"Figure it out for Yourself"*

by George Washington Carver  
(minus the 4th stanza)



# MATHEMATICS

The mathematics section of the Academic Pentathlon for Grade 7 uses the California Standards for the content of the questions in a rich, problem-solving environment. The 30-question test has been designed so that calculators are not required or allowed. While any of the content standards may be used for questions, a greater emphasis will be employed in the following key areas.

## California Standards

### 40% NUMBER SENSE

Students should be able to perform the four basic operations using integers, fractions, and decimals.

7NS 1.2

Students should be able to take positive rational numbers to whole number powers and also be able to multiply, divide, and simplify rational numbers by using exponent rules.

7NS 1.2

7NS 1.3

Students should be able to recognize which rational numbers are terminating or have repeating decimals, convert terminating decimals into simplified fractions, and differentiate between rational and irrational numbers.

7NS 1.4

7NS 1.5

Students should understand the meaning of the absolute value of a number and be able to determine the absolute value of real numbers.

7NS 2.5

### 40% ALGEBRA AND FUNCTIONS

Students should be able to express quantitative relationships by using algebraic terminology, expressions, equations, inequalities, and graphs.

7AF 1.1

Students should be able to graph and interpret linear and simple nonlinear functions. Students should also be able to determine the slope of a line and plot values of quantities whose ratios are always constant.

7AF 3.3

Students should be able to solve simple linear equations and inequalities, including two-step equations/inequalities, using one variable and multi-step problems involving rate, average speed, distance, time, and direct variation.

7AF 4.1

7AF 4.2



# MATHEMATICS

## **20% MEASUREMENT AND GEOMETRY**

Students should be able to choose appropriate units of measure and use ratios/rates to convert within and between measurement systems. **7MG 1.3**

Students should be able to compute the perimeter, area, and volume of common geometric figures, as well as understand the effects of changes of scale. **7MG 2.3**

Students should be able to use the Pythagorean Theorem and its converse. **7MG 3.3**

Students should be able to use the idea of congruence and similarity of geometric figures to determine length of sides and measurement of angles. **7MG 3.4**



# SCIENCE

## PHYSICAL PRINCIPLES IN LIVING SYSTEMS

Standards 7.6

Students will display an understanding of the physical principles that underlie biological structures and functions. Students will be expected to understand the electromagnetic spectrum and its effect on living things. Students need to know that for an object to be seen, light emitted by or scattered from it must enter the eye, and that light travels in straight lines except when the medium it travels through changes. Retinal cells react differently when different wavelengths (colors/pigments) mix to create white light. Student will understand the structures of the eye. Human joints within the body will be compared with structures used in machines and simple devices.

- 70%**
- I. Physical Principles of Light and Living Systems**
- a. Waves
    - i. Crest/trough
    - ii. Wavelength
    - iii. Amplitude
    - iv. Frequency
    - v. Mediums
  - b. Electromagnetic Spectrum
    - i. Radio waves
    - ii. Microwaves
    - iii. Infrared waves
    - iv. Visible light
      - 1. ROYGBIV
      - 2. Wavelength
      - 3. Frequency
    - v. Ultraviolet rays
    - vi. X rays
    - vii. Gamma rays



# SCIENCE

## I. Physical Principles of Light and Living Systems – *cont.*

- c. Lenses
  - i. Virtual image
    - 1. Mirror
  - ii. Real image
  - iii. Types of lenses
    - 1. Convex
    - 2. Concave
  - iv. Focal point
  - v. Focal length
  - vi. Uses/effects
    - 1. Telescopes
    - 2. Microscopes
    - 3. Camera
    - 4. Magnifying glass
    - 5. Eyeglasses
- d. Properties of visible light
  - i. Transmission
    - 1. Opaque
    - 2. Translucent
    - 3. Transparent
    - 4. Filters
  - ii. Refraction
  - iii. Reflection
    - 1. Angle of incidence
    - 2. Angle of reflection
    - 3. Regular
    - 4. Diffuse
  - iv. Absorption
  - v. Scattering
  - vi. Combining colors (lights and pigments)
    - 1. Primary
    - 2. Secondary
    - 3. Complimentary
- e. Path of light through eye
  - i. Cornea
  - ii. Pupil
  - iii. Lens
  - iv. Retina
  - v. Photoreceptors
    - 1. Cones
    - 2. Rods
  - vi. Iris



# SCIENCE

30%

## II. Physical Properties of Biological Structures and Functions

- a. Work
- b. Simple machines
- c. Musculoskeletal system
  - a. Levers
    - i. Types
      1. First class
      2. Second class
      3. Third class
    - ii. Parts
      1. Fulcrum
      2. Effort/input
      3. Load/output
  - b. Joints
    - i. Types
      1. Hinge
      2. Ball-and-socket
      3. Gliding/sliding
      4. Pivot
      5. Saddle
      6. Ellipsoid
    - ii. Ligaments
    - iii. Cartilage
  - c. Levers in the body
    - i. Joints: fulcrum/pivot point
    - ii. Bones: lever
    - iii. Muscles: effort
  - d. Mechanical advantage
- d. Circulatory system
  - a. Heart valves
    - i. Locations
    - ii. Function/flow of blood
  - b. Blood pressure
    - i. Systolic
    - ii. Diastolic



# **SOCIAL SCIENCE**

## **(SUPER QUIZ)**

### **EXPANSION AND DISINTEGRATION OF THE ROMAN EMPIRE**

#### **Standard 7.1**

Students will study the social, cultural, and architectural changes that occurred in the Roman Empire. As a basis for this understanding, students will analyze the causes and early strengths and lasting contributions of Rome. The significance of citizenship, rights under Roman law, Roman art, architecture, engineering and philosophy, and Christianity will be examined. Rome's ultimate internal weaknesses will be explored in terms of the rise of military powers within and outside the empire as well as the undermining of citizenship by the growth of corruption. The establishment of Constantinople and the Byzantine Empire will be studied in relationship to the development of two distinct European civilizations, Eastern Orthodox and Roman Catholic, with two distinct views on church – state relationships.

#### **I. EARLY ROMAN ORIGIN AND GEOGRAPHY**

- A. Founding of Rome/legends (Romulus & Remus/location)
- B. Etruscans
- C. King Tarquin
- D. Map locations of important Mediterranean civilizations modern names
- E. Roman's location and change in size of territory
- F. Pliny the Younger/Elder

#### **II. GOVERNMENT/SOCIETY/CULTURE**

- A. Republic
- B. Laws
- C. Senate
- D. Citizenship
- E. Julius Caesar
- F. Family
- G. Religious beliefs
- H. Philosophy/stoicism
- I. Language
- J. Calendar
- K. Twelve Tables



# SOCIAL SCIENCE

## (SUPER QUIZ)

### GOVERNMENT/SOCIETY/CULTURE – *Cont.*

- L. Architecture/Art/Engineering
  - 1. Murals, mosaics, frescos
  - 2. Sculptures
  - 3. Aqueducts
  - 4. Vault
  - 5. Dome
  - 6. Trajan's Column
  - 7. Pantheon Dome
  - 8. Roman Colosseum
  - 9. Circus Maximus
  - 10. Insulae
  - 11. Triumphal Arch
  - 12. Appian Way

### III. PAX ROMANA/ROMAN EMPIRE

- A. Octavian/Augustus
- B. Trajan
- C. Hadrian
- D. Marcus Aurelius
- E. Marcus Tullius Cicero

### IV. DECLINE OF THE EMPIRE

- A. Diocletian
- B. Constantine I
- C. Economics Problems
- D. Social Problems (latifundia)
- E. Weaker Army
- F. Praetorian Guard



# **SOCIAL SCIENCE**

## **(SUPER QUIZ)**

### **IV. DECLINE OF THE EMPIRE – *Cont.***

#### **G. Barbarian Invasions/geographical locations**

1. Huns
2. Visigoths
3. Ostrogoths
4. Vandals
5. Clovis
6. Attila the Hun
7. Franks - Gaul
8. Angles - England
9. Saxons - England
10. Jutes - England

### **V. THE BYZANTINE EMPIRE**

1. Constantinople
2. Government
3. Justinian I/Theodora
4. Territory
5. Christianity: two strands
  - a. Schism
  - b. icons
  - c. Nicene Creed
6. Art and Architecture
  1. Hippodrome
  2. Mese
  3. Hagia Sophia
  4. Housing
  5. Imperial Palace
  6. Icons



# 2012 SOURCES

## LITERATURE

1. ***Phoenix Rising***  
Author: Karen Hesse  
Publisher:  
ISBN Number: 978-0-312-53562-9
2. ***Grammar Sites***  
<http://grammar.ccc.commnet.edu/grammar/>  
(with this one click on the Index)
3. <http://englishplus.com/grammar/>

## SOCIAL SCIENCE

1. ***History Alive! The Medieval World and Beyond – Student Edition***  
Chapters 1 & 6  
Author: Wendy Fry  
Publisher: Teachers' Curriculum Institute  
Date: 2005  
ISBN Number: 1-58371-376X
2. ***Medieval and Early Modern Times – Teacher's Edition***  
Chapters 1 & 2  
Author: Diane Hart  
Publisher: Pearson-Prentice Hall  
Date: 2006  
ISBN Number: 0-13-1310550



# 2012 SOURCES

## SOCIAL SCIENCE – *Cont.*

3. ***World History – Medieval and Early Modern Times – Teacher’s Edition***  
Chapter 2  
Authors: Stanley M. Burstein and Richard Shek  
Publisher: Holt, Rinehart and Winston  
Date: 2006  
ISBN Number: 0-618-53295-1
4. ***World History – Medieval and Early Modern Times***  
Chapters 1, 2 & 3  
Authors: Douglas Carnine, Carlos E. Cortes, Kenneth R. Curtis, Anita T. Robinson  
Publisher: McDougal Littell  
Date: 2006  
ISBN Number: 0-03-073402-
5. ***Websites***  
[www.aviewoncities.com/rome/circusmaximus](http://www.aviewoncities.com/rome/circusmaximus)  
[www.historyforkids.org/learn/romans/architecture/insulae](http://www.historyforkids.org/learn/romans/architecture/insulae)

## SCIENCE

1. ***McDougal Littell: Science: Focus on Life Sciences***  
California Standards Edition  
Chapters: 10 (all), 11 (section 2), 13 (all), and 14 (all)  
Author: James Trefil et al  
Publisher: McDougal Littell, division of Houghton Mifflin  
Date: 2007  
ISBN Number: pupil ed: 0-618-80967-8
2. ***Prentice Hall Science Explorer: Focus On Life Science***  
California Edition  
Chapters 2, 13, and 14  
Author: Elizabeth Coolidge-Stoltz, M.D., et al  
Publisher: Prentice-Hall Inc.  
Date: 2008  
ISBN Number: teachers’ ed: 0-13-201273-1



# 2012 SOURCES

## SCIENCE – *Cont.*

3. ***Holt Science and Technology: Life Science***  
California Edition  
Chapters: 3 (all), 15 (sections 2-3), 16 (Sections 1-2), and 17 (section 2)  
Author: Katy Z. Allen, et al  
Publisher: Holt Rinehart and Winston  
Date: 2007  
ISBN Numbers: teacher's ed: 0-03-046459-5