Teacher's Guide for ODYSSEY

"Olympic Gold: Physics or Fate?"
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Teacher's Note:
This guide contains project ideas, short answer, extended response, fill-in, and true/false with correction. The variation is designed to have the students think critically, as well as to test their comprehension. An answer key to the short answer sections can be found at the end of the guide.

Extended Response: Comprehension & Critical Thinking
The questions below can be used as written, simply answered in complete sentences or easily transformed into longer essay (ELA) style questions, or even research topics. In any case, have the students support their answers with details from the text or use critical thinking skills to create a thorough and interesting answer. The questions, essays and projects have been aligned with the **Common Core Standards**. Consider the level of your students when deciding how to use the questions.

"From Head to Toe" p. 6-10

1. What type of training is the US Olympic Training Center in Colorado Springs dedicated to?
2. Why is it advantageous for an athlete at such a high level to work with a team?
3. How do Sport Psychologists help athletes train their brains for success?

Mini Project: *Make a chart showing the effects of positive and negative emotions on the body's systems. Write a paragraph explaining why this type of information is beneficial to the athlete.*

4. How can an athlete use the results from a polar diagram ("peanut graph") to improve performance?
5. What is the AlterG Anti-Gravity Treadmill? How is it used differently in space and on Earth?
6. How can blood tests be used to help an athlete train?
7. How and why do advanced athletes maintain an even core body temperature?
8. What are the advantages of high-altitude training?
9. What is the goal of sport nutrition?

"Coming Full Circle" p. 11-15

1. How does Biomechanic Jill McNitt-Gray help athletes improve their performance?
2. Who does an athlete's performance enhancement team include?
3. Explain the study of biomechanics and tell what it includes.
4. What is the difference between a 'force' and a 'reaction-force'?
5. What happens when you change your velocity?
6. Why do gymnasts stick the landing more often when doing a backward somersault as opposed to a forward somersault?
7. How is it helpful to study 'kinematics' when trying to improve the success of a gymnast's landing?

8. What are some of the most important lessons that McNitt-Gray's research has revealed?
9. What steps does the biomechanics expert take to identify solutions and to come 'full circle"?

"Battling Past Gates" p. 20-23

1. Why can a curved line sometimes get you to the gate faster than a straight path?
2. What is momentum?
3. Explain how Caroline Queen's stubbornness helped her to make the national team.
4. What type of exercises does Caroline do to keep herself strong?
5. How long is the typical slalom race?
6. What do athletes wear during this event?
7. How is sports psychology important in the sport of kayaking?

Essay: Caroline's stubbornness was actually a positive attribute for her during an important race. Write about a time that a usually negative personality trait of yours helped you to be successful.

"Gold Medal Mind" p. 24-28

Read the article in its entirety and then fill in the blanks. Refer back to the text if necessary.

1. This article states that although the body may compete for Olympic medals, they are won with the _____.

2. The kind of _____ that are set for an athlete can have a huge impact on their motivation.

3. _____-_____ training is dedicated to setting goals that motivate athletes to continually improve their own performance.

4. A state of consciousness in which we become totally and effortlessly absorbed in what we are doing is referred to as _____.
5. When a player reaches an almost superhuman level of performance and achieves a flow state through a challenge/skills balance, we use the phrase "in the _____".

6. The fight or flight mechanism that prepares our body to either fight off a potential danger or run away as fast as possible is part of the _____ system.

7. Using mental imagery to simulate a task or event is known as _____. It actually makes you better at the event for real!

8. Scientific research has proven that it can increase confidence, reduce _____, and help improve performance.

9. It is wise to use _____ to your advantage as it is a natural reaction that prepares the body for performance.

10. Concentration requires _____ and effort.

"Engineering the Perfect Game" p. 29-31

1. What kind of things does a sports engineer analyze when looking for ways to give the player an edge to win?

2. How did the 'spaghetti racquet' threaten to completely change the sport of tennis and what was done about it?
3. How are today's racquets and balls tested for tournament play?
4. Why is it advantageous to hit the ball on the 'sweet spot' or node point of the racquet?
5. How do you suppose the next big advances will come in the sport of tennis?

"Fueling" p. 35-37

1. What is the function of the spinal cord? How can damage to the spinal cord cause paralysis?
2. Why is optimal nutrition even more important to spinal cord injury athletes?
3. How does fiber change the way the body processes sugars?
4. Define 'thermoregulate'.
5. How can SCI athletes lessen their risk for osteoporosis?
6. What is the history behind the first-ever Paralympic Games?

"Fastest, Highest, Strongest" p. 38-41
Mark the following statements TRUE or FALSE. Provide the correct answer if false.

_____ 1. The official motto of the modern Olympic games is *citius, altius, fortius.* This means faster, higher, stronger.

_____ 2. A 2011 study suggested that record setting peaked in the mid 1980s for many track and field events.

_____ 3. 'Asymmetrical' is a limit line that is approached but never reached.

_____ 4. One major benefit that today's competitors have that Ancient Greek Olympians did not have was an abundance of nutritious food and sanitized drinking water.

_____ 5. Cybernetics is the science that studies the similarities between animals and athletes.

_____ 6. Rugby and golf will be added to the Rio de Janeiro Games in 2016.

_____ 7. Athletes, coaches and sponsors worry that fans will be less interested in the games if fewer records are broken.

_____ 8. The ancient Greeks did not keep track of their Olympic athletes and performances.

"Dive Right In? NOT!" p. 42-43

1. What is the difference between acute traumas and overuse injuries? Give an example of each.
2. What type of physical activities do children in the training center in China engage in months before ever diving into a swimming pool?
3. According to Dr. Steven Anderson (who works closely with the US Olympic diving team) how do injuries occur?
4. What is the key to preventing injury?

5. Explain the old adage, "An ounce of prevention is worth a pound of cure" and how it applies to athletes.

ANSWER KEY:

"Gold Medal Mind"

1. *mind*
2. *goals*
3. *mastery-oriented*
4. *flow*
5. *zone*
6. *nervous*
7. *visualization*
8. *anxiety*
9. *stress*
10. *intention*

"Fastest, Highest, Strongest"

1. *True*
2. *False, 1980's*
3. *asymptote*
4. *True*
5. *False, between machines and living things*
6. *True*
7. *True*
8. *False, Victors List*