

Teacher's Guide for ODYSSEY

July/August 2013: Speed!

*Teacher Guide prepared by: Nancy I. Colamussi, Elementary Education, B.S., M.A.
Shoreham Wading River School District, Long Island, New York*

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.

"Formula 1, The Fastest Sport in the World" p. 4-7

1. Explain the following statement in your own words: "F1 is more than just a contest for the best drivers in the world; it's an ongoing quest to build the perfect racing machine."
2. What is the season of the Grand Prix?
3. What is a constructor team?
4. How many teams take part in the Grand Prix?
5. What happens in the 'pit'?
6. What is the average speed of the racers during the Grand Prix?
7. What did Bruce McLaren contribute to the world of racing?
8. The raceday team consists of the driver, the race engineer and the pit crew. Explain the vital importance of each one.
9. Why is the shell of an F1 racecar made from carbon fiber?
10. What is unique about a racecar's steering wheel?
11. What decisions have to be made concerning the tires?
12. What safety devices are utilized in the cockpit in order to protect the driver?

"Racecar Anatomy" p. 8-11

Match the keyword on the left with the correct definition on the right. Answers can be found at the end of this guide.

_____1. Monocoque

A. Allows fans a driver's-eye view of the race

- | | |
|------------------------------|---|
| _____2. Engine Intake | B. Frame of the car, where everything is attached |
| _____3. Nose Cone | C. Where air is pulled in to cool the disc brakes |
| _____4. Firewall | D. The shell of the car body |
| _____5. Roof Flaps | E. Instead of glass, keeps the driver's head and arms inside the car during a crash |
| _____6. Window Net | F. A cage made of steel tubing inside the car, to protect driver |
| _____7. Cockpit | G. Help keep the car from going airborne during a spin |
| _____8. Cowl Induction | H. Channels air underneath the chassis to create downforce |
| _____9. Brake Cooling Intake | I. Where air is pulled into the engine |
| _____10.Chassis | J. The padded compartment where the driver sits |
| _____11. Roll Cage | K. Where air is pulled into the engine through the air cleaner |
| _____12. Television Camera | L. Steel plate that separates the driver's compartment from the engine compartment |

"Nascar Explained" p. 16

Read the article in its entirety and then fill in the blanks. Refer back to the text if necessary. Answers can be found at the end of this guide.

1. NASCAR stands for National Association for _____ Car Auto Racing.
2. The cars used for NASCAR are heavy...weighing in at _____ pounds.
3. There are _____ major races, or series per year.
4. The _____ Series is the most competitive and has 34 races from February to November.
5. The final ten races which are used for qualifying are called The _____ for the cup.

6. Each race is a total of _____ miles.
7. Average racecar speed during a race is _____ miles per hour.
8. Over each season, drivers accumulate _____ that help them qualify for the top three NASCAR series.
9. The _____ crew is allowed 7 members.
10. The first driver to receive a _____ flag is the official race winner.

"Building the Perfect Racecar" p. 20-23

1. Why is aerodynamics considered to be the biggest factor in racecar design?
2. What is the job of a vehicle dynamicist?
3. How does engineering knowledge combined with creativity and the ability to visualize improve chances for success in the field of design engineer?
4. How do aerodynamicists gather their knowledge?
5. Why is it essential to the perfect combination of driver and car to find success on the track?

"Quick Zach!" p. 24-27

1. How did Zach Veach wind up on the Andretti Autosports racing team?
2. What is the goal of the Indy Light's Series?
3. What is 'aero grip'?
4. What is the shorthand for a car's position on the track?
5. Why did Zach become a national spokesperson for FocusDriven?
6. What age group has the largest proportion of drivers who are distracted?
7. Explain the app that Zach created. Would you use it?

"Suited for Safety" p. 28-29

1. What are the two main threats in car racing?
2. Why are the high-tech synthetic fibers, aramids, a common part of the world of racing?
3. What does TTP (Thermal Protective Performance) measure?

Essay: Although the industry is always improving ways to protect the driver, what about the fans? Do you think the audience, particularly those closest to the track need protection?

"Driving to Win" p. 30-31

1. Explain how basically all parts of the brain are involved as the driver maneuvers the racecar.
2. Although drivers ride alone, how is it that they are part of a team?
3. How do drivers train for races?
4. How can controlled breathing help the racecar driver?
5. What kind of safety measures do drivers take?

"Extreme Racing" p. 36-39

1. Why is the Pikes Peak International Hill Climb a unique race?
2. Describe the landscape surrounding this race.
3. How can weather and altitude be factors in the PPIHC?
4. Why does the thin, cold air wreak havoc on gasoline-powered racecars?
5. How do the cooler temperatures on Pikes Peak affect tires and traction?
6. How can drivers best prepare for the race on Pikes Peak?
7. What is 'drifting' and how does it apply to racing?
8. List a few other extreme races listed in this article and explain what makes it 'extreme'.

ANSWER KEY:

Racecar Anatomy

1. *D*
2. *I*
3. *H*
4. *L*
5. *G*
6. *E*
7. *J*
8. *K*
9. *C*
10. *B*
11. *F*
12. *A*

Nascar Explained

1. *stock*
2. *3,500*
3. *three*
4. *sprint*
5. *chase*
6. *500*
7. *200*
8. *points*
9. *pit*
10. *checkered*