√GE◉MATH

NASCAR, Want to Race? Using NASCAR
to Teach Geography

The student will statistically analyze the Nextel Cup to determine
where auto racing has gone national.

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Grade Level	6-7
Duration	1-2 class periods

Adapted from a lesson by Derek Alderman, East Carolina University

National Geography Standards	Arizona Geography Strand	Other Arizona Standards
ELEMENT ONE: THE WORLD IN SPATIAL TERMS **1.** How to use maps and other geographic representations tools, and technologies to acquire, process, and report information from a spatial perspective **3.** How to analyze the spatial organization of people, places, and environments on Earth's surface	**CONCEPT 1** **World in Spatial Terms** **GRADE 6 and 7** PO 1 Construct maps, charts and graphs to display geographic information. PO 3 Interpret maps, charts, and geographic databases using geographic information.	**Mathematics Common Core Standards** **Ratios and Proportional Relationships** 6.RP.A.3. Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. d. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities. **Expressions and Equations** 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. **Statistics and Probability** 6.SP.A.2. Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape. 6.SP.B.5. Summarize numerical data sets in relation to their context, such as by: a. Reporting the number of observations. b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement c. Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any

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overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.

d. Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.

7.SP.B.4. Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations.

Standards for Mathematical Practice
6.MP.2. and 7.MP.2. Reason abstractly and quantitatively.
6.MP.4. and 7.MP.4. Model with mathematics.

Overview

By integrating math and geography, students can examine how NASCAR racing has truly evolved from a regional sport to a national sport through an analysis of track locations, past and present, and illustrate important mathematical and geographic skills.

Purpose

In this lesson students will compare the distribution of NASCAR tracks in 1970 and 2004. The student will then plot the mean center and analyze why the change occurred.

Materials

- Student Worksheet and Answer Key
- A Short History of Grand National/Nextel/Sprint Cup Races
- 2015 Sprint Cup Series Schedule of Cities
- Table One: Track Locations of the Grand National Races, 1970 and Answer Key
- Table Two: Track Locations of Nextel Cup Races and Answer Key
- Test and Answer Key
- Calculators
- U. S. Map on which to plot mean
- U.S. Map of changes in locations of races

Objectives

Students will be able to:

1. Find the mean center of average locations of racetracks in the United States used by the Nextel Cup through averaging the latitude and longitude coordinates of a series of cities.
2. Compare the changes in tracks and describe the cause and effect of the changes.

Procedures

1. Discuss racing and racetracks. Use "A Short History of Grand National/Nextel Cup Races" if necessary.
2. Using Table One, listing the locations of the tracks that hosted the Grand Nationals in 1970, have the student add the total coordinates for the latitude column and the longitude column. The result will be the average location of the distribution of the racetracks.
3. Take the totals from each column and divide the number by 30, which is the number of cities that hosted the race in 1970. The resulting number is the average location of the distribution of racetracks.
4. Convert the decimal degrees to the traditional format.
A. The whole number remains the same (i.e. 100.25degrees longitude will be 100 degrees).
B. Multiply the decimal by 60 (i.e. .25 X 60 = 15).
C. Place the number in the mean center box on the worksheet.

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5. Repeat the same steps for Table Two, which represents the Nextel Cup Series locations.

6. Plot and label the mean center on your map.

7. Answer the questions on the student worksheet

8. If time allows have the students plot all the 1970 locations and the 2004 locations on the map.

Assessment

To master the math and geography components, students should complete the student worksheets with an 80 % degree of accuracy. The two-question test can be given as a formative or summative assessment. Mastery is considered 100%.

Extensions

Locate the hometowns of drivers and do the same calculations to determine where the mean center would be.

Look at the schedule for 2015 to see what new cities may have been added or what cities have been deleted since 2004. Does the trend west continue?

Sources

Alderson, Derek, Professor of Geography, East Carolina University, gave permission for this lesson to be used by the Arizona Geographic Alliance.