



Math Unit | Grades 8-12 | Lesson 6: Roller Coaster Math

Lesson Description

Roller coasters are a blast but they're even more fun with you ride with friends and family. Have you ever wondered how many people ride one of Silver Dollar City's roller coasters in one day? Or what if there were over 16,000 people at the park on one particular day...if everyone wanted to ride one ride, would there be enough time? These are the types of things engineers look at in the design phase of a ride. A theme park coaster's design is directly affected by how many people a coaster holds and how long each ride takes. Using the worksheet, gather the missing information and learn some interesting facts about roller coaster strategy!

Concepts

Solving equations
Division
Roller coaster engineering

Multiplication
Basic math

Objectives

Students will:

- Simplify expressions using correct order of operations.
- Gather missing information and use those numbers to solve equations.
- Use problem solving skills to work through engineering questions.

Content Standards

National Standards in Mathematics

- **Standard 1:** Uses a variety of strategies in the problem-solving process.
 - Benchmark 2, Grades 6-8: Uses a variety of strategies to understand problem-solving situations and processes (e.g., considers different strategies and approaches to a problem, restates problem from various perspectives).
 - Benchmark 1, Grades 9-12: Uses a variety of strategies (e.g., identify a pattern, use equivalent representations) to understand new mathematical content and to develop more efficient solution methods or problem extensions.



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- **Standard 3:** Uses basic and advanced procedures while performing the processes of computation.
 - Benchmark 1, Grades 6-8: Adds, subtracts, multiplies, and divides integers, and rational numbers.
 - Benchmark 4, Grades 6-8: Selects and uses appropriate computational methods (e.g., mental, paper and pencil, calculator, computer) for a given situation.
 - Benchmark 6, Grades 6-8: Uses proportional reasoning to solve mathematical and real-world problems (e.g., involving equivalent fractions, equal ratios, constant rate of change, proportions, percents).
 - Benchmark 1, Grades 9-12: Adds, subtracts, multiplies, divides, and simplifies rational expressions.

Grade Level Expectations

Numbers and Operations

Understand meanings of operations and how they relate to one another.
Compute fluently and make reasonable estimates.

Algebraic Relationships

Represent and analyze mathematical situations and structures using algebraic symbols

Time Required

Varies by student

Materials

- Student Activity Sheet off the Kids-U-Cation website
 - Writing utensil
 - Calculator
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Procedures

1. Print out the student activity sheet off the Kids-U-Cation website.
 2. Use facts given in the packet to solve the equations.
 3. Walk around the park to gather any missing information, then complete the equations using mental math and calculators.
 4. Turn into the teacher for a completion or accuracy grade.
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Closure

Review the key points of this lesson by discussing the following:

- Why is important to know how many people can ride a roller coaster in a typical operating day?
- How does the length of a ride affect guest enjoyment?
- Pick a ride you wish would have lasted longer. Were there any you thought were too long?
- On days with high attendance, what advice would you give to the ride operators?
- Discuss why accurate math figures are imperative for the safety and enjoyment of the ride.

Assessment/Independent Practice

Give an assignment or test of your choosing.



Name/Date: _____

Roller Coaster Math

Roller coasters are a lot of fun but believe it or not, there's a lot of strategy that goes into them too. How long a ride takes and how many passengers it holds plays a big part in the customer's experience. For this exercise, assume every seat has a passenger in it (every ride is maxed to capacity). Using the attendance given and length of ride, figure out the missing information.

	WildFire	PowderKeg	The Giant Swing (both arms running)	Thunderation
Number of Seats Per Ride:				

In this chart, use the attendance below and the information above to determine how many times one cart would have to go around the track to get every person in the park to ride each roller coaster one time. (round to the nearest tenth – use the back of this sheet for scratch paper)

Attendance	WildFire	PowderKeg	The Giant Swing (both arms running)	Thunderation
16,751				
8,484				
7,865				
3,201				

Using your answers above and the information below, figure out how long it would take for every guest to ride each roller coaster one time. Assume the roller coaster runs non-stop. If Silver Dollar City was only open for 9 hours that day, would everyone be able to ride?

	WildFire	PowderKeg	The Giant Swing	Thunderation
Length of ride:	2 min. 16 sec.	2 min. 53 sec.	60 sec.	2 min. 20 sec.

WildFire		The Giant Swing		PowderKeg		Thunderation	
Attendance: 8,484		Attendance: 16,751		Attendance: 3,201		Attendance: 7,865	
Would each guest get to ride in the 9 hour day?	Write down, how many guests would get to ride in 9 hours?	Would each guest get to ride in the 9 hour day?	Write down, how many guests would get to ride in 9 hours?	Would each guest get to ride in the 9 hour day?	Write down, how many guests would get to ride in 9 hours?	Would each guest get to ride in the 9 hour day?	Write down, how many guests would get to ride in 9 hours?
How long would SDC have to stay open for every person to ride? (in hours):		How long would SDC have to stay open for every person to ride? (in hours):		How long would SDC have to stay open for every person to ride? (in hours):		How long would SDC have to stay open for every person to ride? (in hours):	