

THE GREAT ROLLER COASTER DESIGN CHALLENGE CHERI NATIONS, NORTH GWINNETT MIDDLE SCHOOL

GRADE LEVEL AND CONTENT: 8th Grade Engineering Applications, Physical Science, and Visual Arts

OVERVIEW

In this project-based learning unit that integrates engineering applications, physical science, and visual arts, students assume the role of engineer to build a safe, stable, and fun roller coaster. Using the Engineering Design Process as the guide, students research effective designs, sketch a prototype, build the roller coaster, as well as calculate the average speed and energy of the roller coaster. Throughout the unit students document the design process and use the media to create an online presentation for their peers. Students finish the unit by grading the peers' work.

STANDARDS ADDRESSED

Engineering Applications: STEM-EA-4; STEM-EA-9; STEM-EA-10

Physical Science: S8CS1; S8CS3; S8CS4; S8CS5; S8CS6; S8CS10; S8P2; S8P3

Visual Arts: VA8MC.1; VA8MC.2

AVAILABLE MATERIALS

- Video of Unit
- Daily Lesson Plans
- Roller Coaster Design Project
- Roller Coaster Simulation Notes
- Roller Coaster Budget
- Gallery Walk Activity Sheet
- Calculating Average Speed of a Rolling Marble
- Calculating Potential Energy and Kinetic Energy
- Types of Energy PowerPoint
- Calculating Speed and Energy PowerPoint
- Roller Coaster Design Student Rubric
- Roller Coaster Design Teacher Grading Form
- Roller Coaster Design Rubric



ABOUT THE TEACHER

Cheri Nations is currently a Science Enrichment teacher at North Gwinnett Middle School in Sugar Hill, Georgia. Ms. Nations received a Bachelor of Science in chemistry from the Georgia Institute of Technology. Her teaching approach integrates all subject areas, emphasizes a student-centered classroom, and connects each lesson with real world situations. Ms. Nations was named one of the 25 semifinalists for 2017-2018 Gwinnett County Public Schools' Teacher of the Year.