

R2R Professional Development



NASA Langley Research Center **Rockets 2 Racecars STEM Education Program**

Developed by NASA Education Specialists:

Bonnie Murray, Karen Ricks, and Marilé Colon Robles

R2R Professional Development Workshop Series

Beginning April 23rd, 2013, Aerospace Education Services Project, AESP, and NASA Digital Learning Network™, DLN, presents a series of professional development workshops tailored to Math Education Curricula. These free workshops are designed to enhance the curriculum activities with NASA inspired lessons. All professional development workshops provide. Participants interested in receiving continuing education units applicable towards license renewal must register and complete the 4 workshop series to accumulate 5 workshop hours.

Workshop sessions are presented by highly acclaimed, certified education specialists through video conferencing. NASA subject matter experts equip your teachers with the content needed to improve student learning. Courses run twice a week for 2 weeks, 75 minutes during each session, covering a range of topics aligned with the National Council of Teachers of Mathematics (NCTM) and Common Core State Initiatives.

Registration through NASA AESP is required! Please use the following link to register <https://digitalmedia.wufoo.com/forms/dln-virtual-professional-development-form/>

3:15 PM– 4:30 PM ET		
	Measure Up and Calculate	Tuesday, April 23 rd , 2013
	May the Force Uplift You...or Not!	Thursday, April 25 th , 2013
	Newton's Angle on Force and Motion	Monday, April 29 th , 2013
	Drag Race to Mars	Wednesday, May 1 st , 2013

2013 *Rockets 2 Racecars* Workshops



Measure Up and Calculate

Description:

Through math, teachers help students learn about tire technology and the effects of air pressure. Students compare and contrast a section of tire from the Space Shuttle, a light truck, and a bicycle. Students complete formulas for air pressure, circumference, and the number of revolutions of a tire over a given distance.

Students also investigate the concept of center of gravity and determine the point of balance by manipulating the weight distribution of a racecar's tires.

NATIONAL MATH STANDARDS K-12

- Number and Operations
- Algebra
- Measurement
- Data Analysis and Probability
- Process



May the Force Uplift You. Or Not!

Description:

When you're traveling at speeds of 200 miles an hour, it's important to understand that faster moving air creates lower pressure! Air traveling around a curved surface speeds up, creating an area of low pressure. Math teachers explore the physical science of Bernoulli's Principle by applying mathematics to interpret air pressure and air flow data on objects such as an airplane's wing or a

racecar spoiler. Students learn to read data generated through flight testing and racing and interpret experimental data to understand the science of rockets and racecars.

COMMON CORE STATE STANDARDS FOR MATHEMATICS (NCTM)

OPERATIONS AND ALGEBRAIC THINKING

- Generate and analyze patterns
- Analyze patterns and relationships
- Write and interpret numerical expressions



Newton's Angle on Force and Motion

Description:

There are many variables that affect car's ability to travel a straight path, let alone speed around a racetrack. Math teachers test the students' ability to control these variables and build a car that will travel the farthest distance. Students construct a balloon-powered racecar and test the cars along a measured track. Using a protractor, students manipulate the angle of force and measure the distance traveled.

NATIONAL MATH STANDARDS K-12

- Number and Operations
- Geometry
- Measurement
- Data Analysis and Probability
- Process



Drag Race to Mars

Description:

Teachers bridge science and math by designing a capsule to land on Mars, just as NASA engineers have. As the capsule rushes through the atmosphere, it is speeding towards the surface, headed for a crash landing! Students will need to use the drag of the atmosphere to slow the capsule down. Students judge the speed or rate of descent and record measurements of their capsule design as it attempts to safely land the science payload.

COMMON CORE STANDARDS FOR MATHEMATICS (NCTM)

- Measurement and Data
- Analyze patterns and relationships
- Write and interpret numerical expressions