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The St. Louis American is proud to partner with Normandy School District, the St. Louis Public School District and the Saint Louis Science Center to provide this classroom tool for STEM education for students in 3rd, 4th and 5th grades, with content based on Missouri Learning Standards.

Newspaper In Education
STEM
science, technology, engineering, and math

CLASSROOM SPOTLIGHT

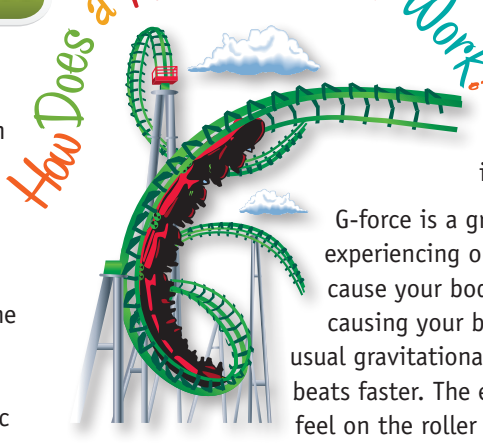
SLPS Spring Break Reading And Math Academy

Teacher Jim Triplett looks on as Demetrius Givens solves a math problem. Givens, a student at Hickey Elementary School, gave up spring break to participate in the SLPS Spring Break Reading And Math Academy held at Gateway Elementary School this week.

Photo by Wiley Price

SCIENCE CORNER

How Does a Roller Coaster Work?



If you are curious about how it feels to be an astronaut, look no further than your local amusement park. You can learn about potential energy, kinetic energy, acceleration, centripetal force, gravity, inertia, G-force, and much more.

When you are riding a roller coaster, the first hill will be the tallest. This allows the roller coaster to gather potential energy. As the roller coaster soars down the hill, the potential energy is changed to kinetic energy, the energy of motion. Acceleration is the process of speeding up, slowing down, or changing direction.

When you go around a sharp turn, you feel pushed against the outside of the car. This force is centripetal force and helps keep you in your seat. In the loop-the-loop upside down design, it's inertia that keeps you in your seat.

Inertia is the force that presses your body to the outside of the loop as the train spins around. Although gravity is pulling you toward the earth, the acceleration force is stronger than gravity, pushing you into your seat.

G-force is a gravitational pull. Right now, you are experiencing one G-force. Riding a roller coaster will cause your body to experience 3 to 6 Gs, which is causing your body to experience 3 to 6 times the usual gravitational pull. When Gs increase, your heart beats faster. The excitement and adrenaline that people feel on the roller coaster is connected to the sudden change in G-forces.

For More Information: If you would like to learn more about roller coaster science, visit: http://www.learner.org/interactives/parkphysics/index2.html

Learning Standards: I can read a nonfiction article for background information.

SCIENCE EXPERIMENT

Become an Aircraft Designer

In this experiment from Exploratorium, you will be creating a spinning blimp. This experiment will allow you to observe how simple changes to design can alter flight patterns. Scientists learn through trial and error to see what is effective and what isn't. Even a "mistake" is learning—it teaches you what does not work.

Materials Needed:
Paper • Ruler • Scissors • Journal to Record Results and Observations • Crayons and Markers (optional)

Process:

1. Cut a strip of paper 6 inches long and ½ inch wide.
2. Cut halfway across the strip about ½ inch from one end. Turn the strip around and do the same thing on the other end.
3. Slip the slot at one end into the slot at the other end to create a circular blimp.
4. Hold the blimp high over your head and drop it to the ground. Watch carefully and see how it spins.
5. Observation time. Experiment with the designs and use your journal to record how these changes affect the spinning pattern of your blimp. Suggestions to try: Make the strip longer or shorter, make the strip narrower or wider, make the tails longer or shorter, cut the ends of the tails into different shapes (rounded or pointy), try using different kinds of paper (construction paper, cardstock, printer paper, etc.)
6. Optional: You can use crayons or markers to color your blimp. Although this won't affect flight pattern, you can observe the designs as your blimp spins.

Reflection: With your class, discuss what worked well and what didn't.

Learning Standards: I can follow directions to complete an experiment. I can make observations on how simple changes affect flight design and patterns.

MATH CONNECTION

The Need for Speed

The following three formulas will help you answer questions about speed.

Time = Distance ÷ Speed
Speed = Distance ÷ Time
Distance = Speed x Time

1. How long will it take a bicycle rider to travel 32 miles at a constant speed of 8 miles per hour? _____
2. If a car travels 170 miles at a constant speed in 5 hours, at what speed was it traveling? _____
3. If a bus travels for 3 hours at 55 miles per hour, how far does it travel? _____
4. A train covers a distance of 520 miles in 8 hours. If it travels at a constant speed, how fast is it traveling? _____
5. If you walk at a steady speed of 4 miles per hour, how long will it take you to walk 14 miles? _____

Learning Target: I can add, subtract, multiply, and divide to solve a problem.

DID YOU KNOW?

Consider these facts about space travel from NASA...

- **The Space Shuttle main engine weighs one-seventh as much as a train engine but delivers as much horsepower as 39 locomotives.**
- **Did you know that to apply to be an astronaut a pilot must have completed 1,000 hours of flying time in a jet aircraft?**
- **The Space Shuttle speed goes from 0 mph to 17,500 mph in 8.5 minutes.**
- **Only 12 men have walked on the moon.**

INVENTORS & INVENTIONS

AFRICAN AMERICAN SPACE ENGINEER—

Aprille Ericsson

Dr. Aprille Ericsson was born in Brooklyn, New York, where she grew up and attended school until junior high. Ericsson received a scholarship to attend Cambridge School in Massachusetts for her high school years. From there, she went to the Massachusetts Institute of Technology (MIT) to earn her Bachelor's degree in aeronautical and astronautical engineering. Ericsson received a Master's degree and Doctorate degree in mechanical engineering from Howard University. Her graduate studies focused on designing digital controllers for orbiting space structures. She also worked to design an instrument that will help map the moon's surface for future explorations.

Aprille Ericsson was the first African American woman to earn a doctorate in mechanical engineering at Howard University. The website ivillage.com liss her as one of 18 women who will change the world. She currently works in the Guidance, Navigation and Control, Design Analysis section at NASA Goddard Space Flight Center. She knew she wanted to work in this field when she first saw the United States go to the moon. When she was a junior in high school, she attended a summer program at MIT where she flew in a pilot simulator.

Ericsson at work at NASA Goddard Space Flight Center.

International Space Station photographed from the Space Shuttle Discovery. Photo: NASA.

Ericsson encourages minorities and females to develop an interest in math, science, and engineering. She encourages them to take a lot of math and science courses and to read articles about the latest developments in those areas, attend summer programs and listen to guest speakers. Furthermore, Ericsson encourages students to become involved in extracurricular activities, such as sports and clubs, to be well rounded.

Learning Standards: I can read a biography to learn about contributions in science, technology, and math.

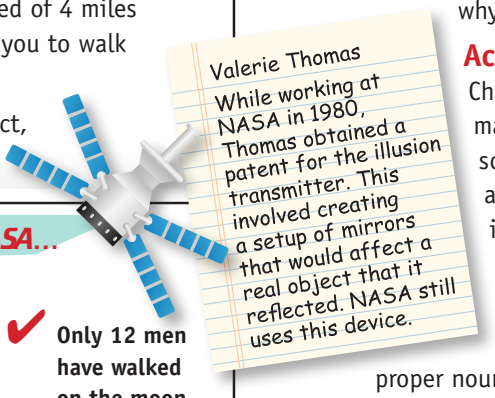
MAP CORNER

Use the newspaper to complete these activities to sharpen your skills for the MAP test.

Activity One: Circle words beginning with capital letters in the newspaper. Discuss why each word begins with a capital letter. Then, identify the words that are proper nouns. Write them in a chart labeled person, place, and thing.

Activity Two: Find an interesting news story to evaluate. Read the story and identify the main ideas. Number the main ideas in order of importance. Explain why you chose that order.

Activity Three: Write to inform. Choose an African American who has made contributions in the field of science, technology, or math. Write a news article about this person to inform your audience about his or her achievements.



Learning Standards: I can use the newspaper to locate proper nouns. I can identify main idea. I can write for a specific purpose (to inform) and for a specific audience.

Content—Jennifer Withwein • Design—Beth Sharpe