

STEM Ideas for Science Classes

Crash Test on the Conservation of Mass

Students research the science behind automobile air bags and determine that air bag inflation is due to a chemical reaction (and the conservation of mass).

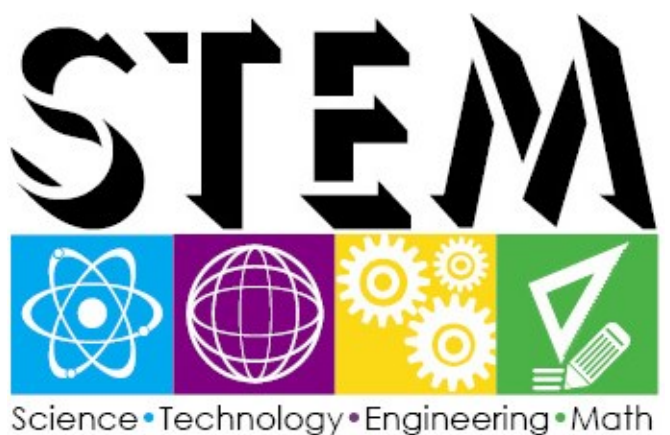
Using this knowledge students determine the ratio of vinegar to acetic acid that will effectively fill a plastic baggie with air and then design a "seatbelt and airbag" mechanism to protect an egg from a drop of 2 meters.

These challenges and activities, connected to the New Jersey CCCS and NGSS, are available for your classes. Please contact your school's STEM Specialist.



# Step into STEM

Bringing engineering into the classroom through an integrative, real-world approach to learning sci-



## HAVE YOU HEARD THE LATEST ON 3D PRINTING?

Scientists can now "print" human-size bones, cartilage and muscle, using a new device called a 3D bioprinter, The tissue and organ structures produced by the printer could one day be used to replace injured or diseased tissues in human patients.



The demand for engineered tissues and organs has been on the rise because of the limited availability of donated tissue and organs.

The 3D printed "ears" have tested and survived when implanted under the skin of mice and even developed blood vessels after two months!

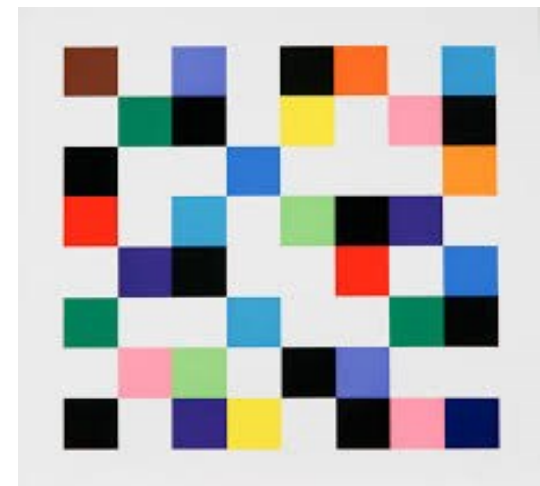
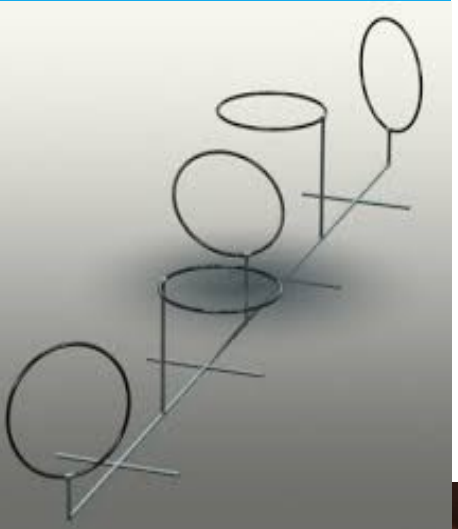
Please see <http://www.livescience.com/53719-photos-bioprinted-human-bones-muscle.html?scrllybrkr> for more information.

## STEM club update

The STEM club teams at Bayshore, Thorne and Thompson have been working hard to build and test their underwater Rovers to compete in the SEA Perch competition on Saturday, April 16th at Rowan University .

The teams will be faced with two challenges this year. They must first navigate through an obstacle course, come to the surface, then re-submerge and return through the course to the end. In addition, students will be required to release 3 different sized objects and transport them in a controlled manner then dropping them into a container.

Best of luck to our STEM club teams!



## STEM and Art

Here are a few ideas for giving STEM projects some STEAM (STEM with ART)

**Design.** Students can apply design and decoration to products that were created during the course of a design challenge. They could use computer graphics to create logos or stylized designs to include in communications or presentations. Through artistic design, students could improve the appearance, design, and usability of a product created during a STEM project.

**Performing arts, such as drama and speech.** What about technical or persuasive writing? Those arts fit naturally into the "Communications" stage of the engineering design process. They would work well as part of a STEM project.

**Creative planning.** As students brainstorm solutions for an engineering problem, encourage them to adopt an inventive, artistic approach. Calling on their artistic right brain can help them to generate more creative and innovative thinking.

Original Article by Anne Jolly, Education Week.

## STEM Resources

### Engineering and Nanoscience:

<http://www.classroomengineers.org/media/nanoscience/>

High School STEM Gap (Boys are still more likely than girls to chose a career in STEM.)

<http://teachers.eqfi-k12.org/high-school-stem-gap/>



NAE connects Educators with Experts

<http://teachers.eqfi-k12.org/nae-connects-educators-with-experts/>

## STEM Ideas for Math Classes

### Bath Salts Percent Error

Students use triple beam balances to measure out the raw materials that go into making basic bath salts — Epsom salt, baking soda and fragrant oil.

After creating individual bags of scented bath salts, they calculate their percent error and determine how much money they may have lost by inaccurate measurements (or how much they may have "shorted" the consumer). Math smells good!



Middle School STEM Specialists

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