The 49ers STEM Leadership Institute’s Weekly Digest
During the coronavirus shutdown
April 20th, 2020

Chemistry in the Kitchen: Cheese
Ever wonder how cheese is made? All cheese starts off as milk, which is made of water, fat, lactose, & proteins. For cheese, we’ll be focusing on the chemistry of a particular protein called casein micelles. In order to make cheese, the casein needs to clump! How can we get it to do that? The casein molecule is a ball with little hair-like strings covering its surface that keep it surrounded by negative charge. This negative charge causes them to repel each other (like two negative magnets). There are two methods For removing the negative charge: (1) flood the protein with positive charge by increasing acidity. The positive charge neutralizes the negative charge or (2) add an enzyme (rennet), which chops off the little hairs & their negative charges. Once that negative charge is gone, the protein clumps, making cheese curds, which then are pressed into cheese.

Experiment with making cheese this week: Herbed Paneer Cheese Ricotta Cheese
Cheese made using the acid method tends to be soft & doesn’t melt very well. Can you guess why?

Check this Out!
The entire NASA media library is open to the public and available to download! Select “Most Popular” for a selection of awe-inspiring pics. Click on each image for more information about its contents. Check it out at NASA.gov

Horses and dogs playing together? A small study has shown that play & communication cues are shared between these two species. Check out more at NationalGeographic.com

Logical Fallacy of the Week
Equivocation
Mr. B cannot freely eat all the chocolate cake in the world, therefore Mr. B does not have free will.

“Equivocation exploits the ambiguity of language by changing the meaning of a word during the course of an argument and using the different meanings to support some conclusion.” In the above example, the meaning of the word “free” changes.

An Illustrated Book of Bad Arguments, Ali Almassi, p16, bookofbadarguments.com

Craft Corner
Experiment with painting! All of the iconically quirky Bob Ross Joy of Painting episodes are available for on YouTube. His show is not only mesmerizing & soothing to watch, but also teaches a stress-free & relaxing approach to painting. If you don’t have a canvas, use scrap cardboard, wood, or paper.

With the help of a few tools, you can create your own mandala! Check it out at Instructables.com. What principles of math & engineering are used?

Taking care...
Looking for ways to find healthy solitude rather than loneliness? Yale fellow Rita Watson has some suggestions on how to do just that in her Psychology Today article. Here are a few of her ideas:
- Light a candle and watch the flame.
- Breathe & listen to [the] rhythm
- Sit with a journal or note cards to write out thoughts that come your way.
- Make a list of your positive qualities.

Culture during COVID-19
Cirque Du Soleil is showing a 60-minute special of ZED, a show only ever performed in Tokyo. Watch the show on their youtube channel

Did you know...
Different metals are what create the different colors in fireworks! Copper makes blue, strontium red, calcium orange, and sodium makes yellow! Check out this YouTube Video from NPR for more!
(Chemists use flame tests to identify metals. Check out this video!)

Happy Pic Of the Week
Learn more about the adorable American Pika

Photo by Tony LePiere

www.49ersSLI.com
49ERS STEM LEADERSHIP INSTITUTE

New to 49ers SLI? Subscribe to the Weekly Digest here!