SAN JACINTO UNIFIED SCHOOL DISTRICT

Science Monthly

District NGSS and Science News

NEW YEAR'S RESOLUTION:

FULL NGSS IMPLEMENTATION

JANUARY 2020

Website of the Month:
Ask Nature

YouTube Channel Of the Month:
Our Changing Climate

NGSS Explained:
The SEPs

Website of the Month: Ask Nature

https://asknature.org/

Biomimicry is the practice of imitating nature with technology and humans are able to live as efficiently as we do thanks to inventors having a keen eye on something they observed happening outside. As young children we look around and try to figure out how things work and this curiosity carries over for some researchers who want to replicate nature in our everyday lives. Sometimes these imitations are more obviously connected than others. Take for example when a hunter puts on a ghillie suit to camouflage with their surroundings, this being similar to how other animals have evolved a textured outer layer to camouflage just like how this stonefish has developed a textured skin to blend in to the ocean floor. The fish uses this biological strategy of growing textures on its skin so it goes unnoticed in the wild. While humans have recorded our scientific research for a few thousand years, genetic data has fine tuned itself over millions of years of natural selection to provide amazing inspiration for our own man-made technologies. When scientists want to build a faster plane, they study falcons. When scientists want to design better windows for homes, they look at… squid? Surprisingly, studying cephalopods and how their skin is able to change colors (passive pigmentation) inspired researchers to design windows that are self-tinting depending on the temperature. I enjoy gardening with aquaponics that is inspired from natural marshlands and how fish and plants live symbiotically in a waterscape.

Ask Nature is a website put together and hosted by the Biomimicry Institute, founded in 2006 to work with schools and museums to educate students about biomimicry and the engineering and design process. This searchable library of information provides two ways to search for resources- either by biological strategy or inspired idea. Some examples of these biological strategies are how sea sponges stick to the ocean floor or how apostle birds jiggle their mud nests before they dry so that the materials are more compact. Perhaps you would rather start on the technology side and see what engineers are already working on by looking at the inspired idea section. Beyond the library, Ask Nature also provides additional outside resources and articles to support your next biomimicry lesson. Try challenging your kids to design solutions based on what they see on the playground or in a nature documentary. Something as simple as designing a better playground slide may take inspiration from looking at how water rolls off different leaves.

Middle and high school teachers, take it a step further with the **Biomimicry Youth Challenge** and see what ideas our teens can come up with! More information at youthchallenge.biomimicry.org.

YouTube Channel of the Month: Our Changing Climate

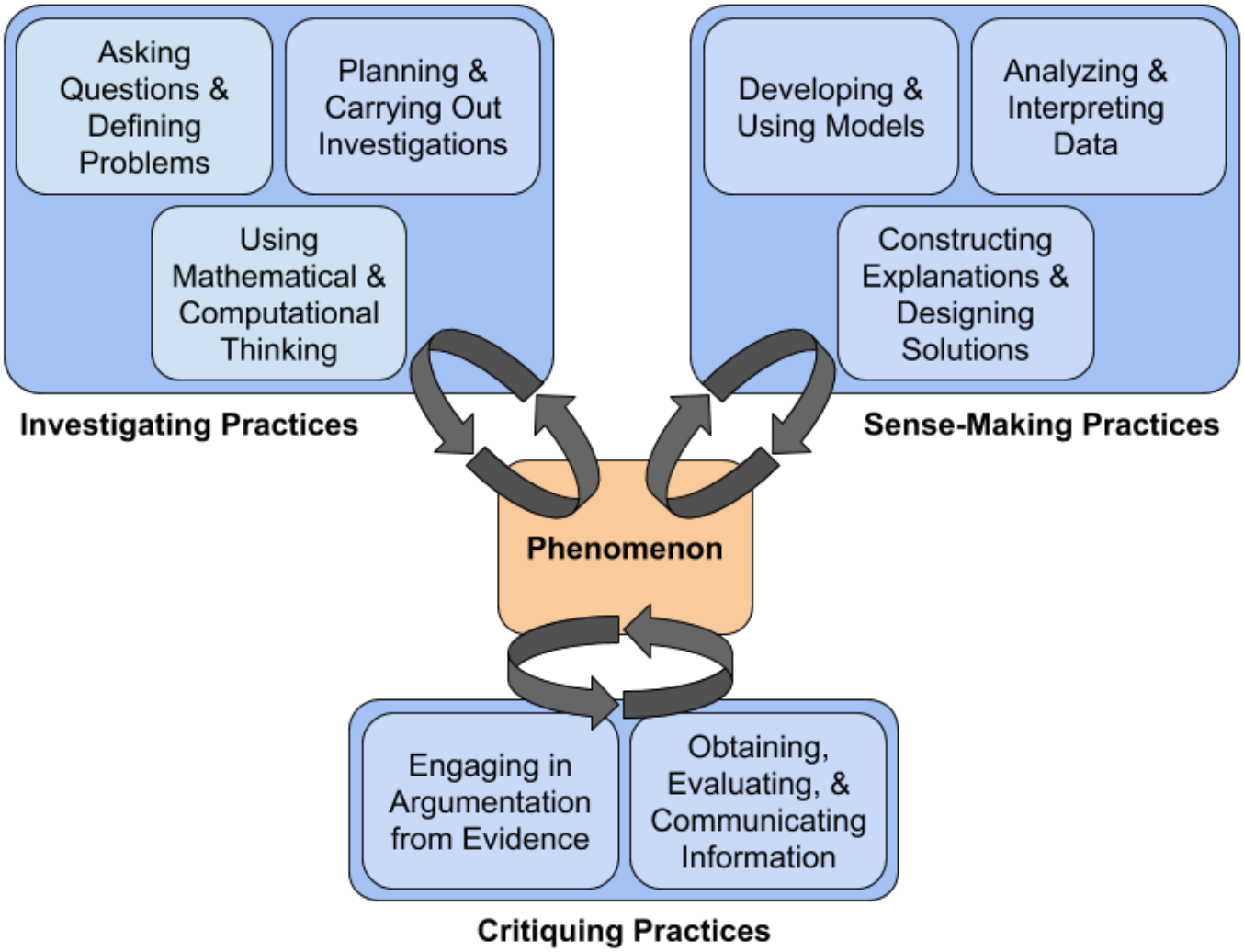
https://www.youtube.com/channel/UCNXvxXpDJXp-mZu3pFMzYHQ

The bad news: Our planet has a fever that even more cowbell cannot satisfy. The good news: Teachers can plant the seeds of hope in our students by having real conversations on how our climate has and will continue to change due to human activity. In our daily lives, the extent of our abilities to combat a global issue is limited by some personal choices we can make and how we use our voices to share scientific facts. Take for example the wave of new plant-based meats that are showing up in fast food restaurants. Up until recently, these alternative products were reserved for vegetarians but now they are being widely accepted as a "better" product for our planet. So what are these alternatives? Does the production of these alternatives really have better impacts on our environment than raising cattle traditionally? Watch the video "Are plant-based meats actually sustainable?" and have a conversation with your students about how we get both types of food.

Our Changing Climate releases a video essay every Friday, fully loaded with citations for your students to continue their own research. One of the biggest skills students should be building on in our science courses is the ability to think critically when presented with facts. Can our students decipher which sources are credible? Are our students open to changing their perspectives when presented with new facts? Get your students conversing with each other, let them respectfully challenge the facts and learn for themselves.

NGSS Explained: The Science and Engineering Practices (SEPs)

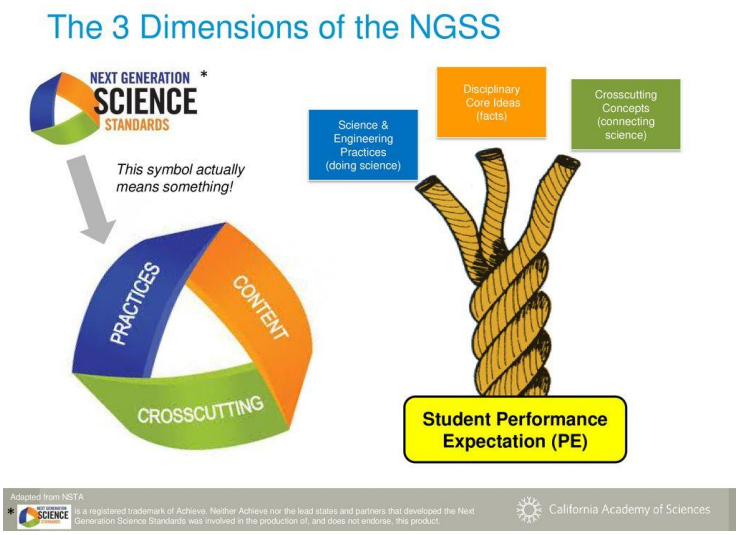
A new year calls for a fresh start. Throughout our district we have a colorful rainbow of skills, each teacher bringing something special to our schools. Understanding that we are all different, we know that everyone is in a different phase of their own teaching journey and I want to make sure that we all at least have a common understanding of the Next Generation Science Standards. Over the next 12 months, I am dedicating a portion of each newsletter to diving deep into the standards.



Outside of the newsletter, there are many articles and videos out there describing ways to teach these skills. If you are a fan of Bozeman Science channel on YouTube, Paul Anderson developed a Next Generation Science Standards playlist of videos that goes into depth explaining each and every SEP, CCC, and DCI. Without any further ado, let's jump in!

Asking Questions (for Science) and Defining Problems (for Engineering)

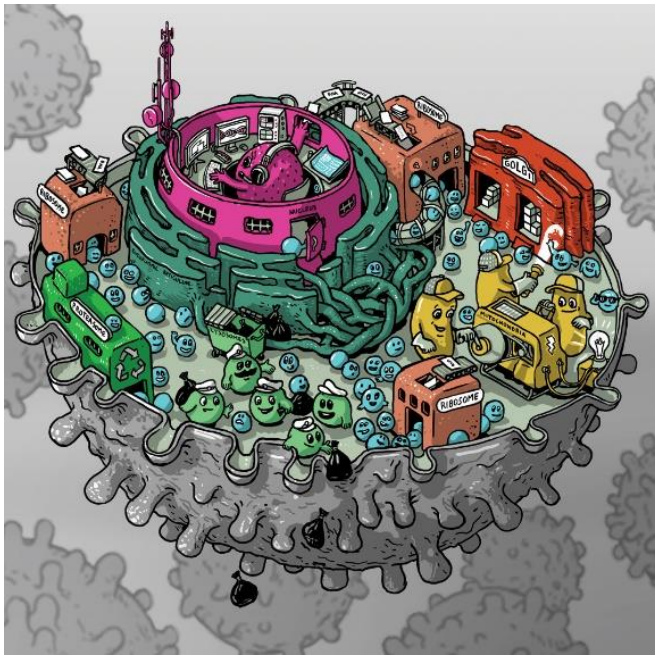
One thing that small children seem to be really good at is asking questions and defining problems. Why is the sky blue? I can't tie my shoes. Why does my little brother stink? Kids observe the world around them in the most honest (and maybe annoying) of ways and point out all that is new and interesting to them in the moment. These are skills that need to be honed instead of being hushed. Undoubtedly, you have come across the scenario when a student comes up to you and says they need help or they don't get the work and they are unable to specifically tell you what they are struggling with. Perhaps when you ask them what they don't understand and they just helplessly reply "all of it." We know that there is something that will flip the switch of understanding, but students are not always able to explicitly state what that problem is.

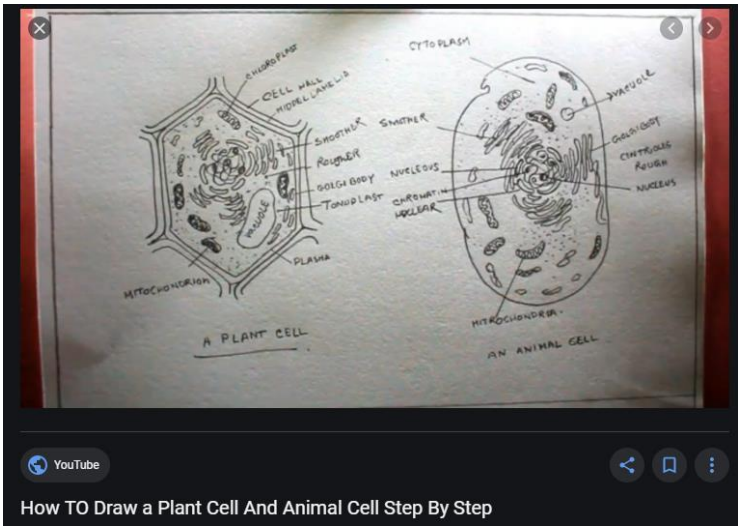


Students need to be provided with opportunities to explore and question, these are skills that need time to be practiced. Phenomena is a great trigger for questioning. Start your lesson with a video or demonstration and allow your students to turn and talk to each other, encourage them to ask questions and wait to explain the science to them. Curiosity can so easily be smothered out of children when they are taught to be quiet and sit still, consider intentionally adding more time to your lessons for students to freely converse with each other about what they are observing.

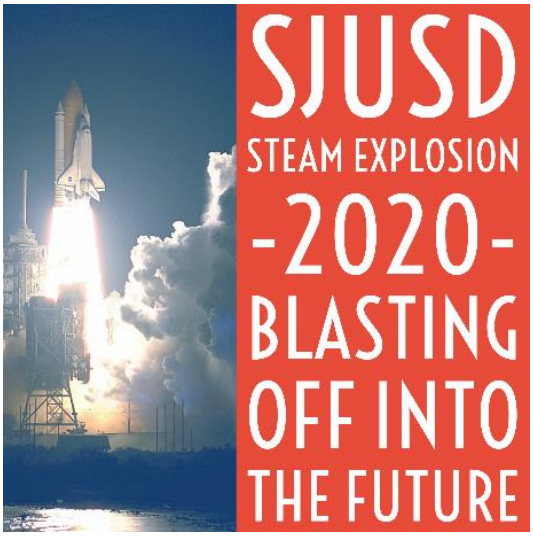
Developing and Using Models

A common model that a 7th grade student may assemble is an animal cell. Grab some modeling clay, glue down some little squigglies to represent the cytoplasm, roll a big ball for the nucleus. At what point however does this cross the line and just become a craft project? How are students thinking and understanding the cell and how those parts actually work together? It's time to rethink the traditional "model" in a science class, or at least who is making and using them. Compare the following two pictures of a cell model.





What do you notice is similar and different about these? Which one seems to demonstrate a deeper level of understanding? What level are you holding your students accountable to? Sure one may just be a more accurate replica of the cell, but think about the purpose of understanding the parts of a cell. We learn that a cell is comprised of organelles that serve different functions. The deeper understanding of the interactions tells us about how cells work, what they need to survive, and thusly what we need to survive. Simply being able to memorize and label the parts of the cell is not enough anymore. Teachers are tasked with the duty of inspiring thought and appropriately challenging students to develop their own conceptions, much more than being able to just photocopy an illustration. A model should be a tool to assist the student in explaining **their own** understandings.



STEAM Explosion 2020

1/24 5:30-7 pm @MVMS Gym

Science & Engineering Fair, Art Contest, and Interactive Stations

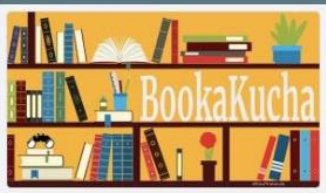
Admission is free and parking will be available in the lot adjacent to the MVMS Gym. Doors will open at 5:30pm and the interactive stations will open immediately following the awards ceremony. See you there!

Ed Tech Resource Page

Looking for more ways to integrate technology into your science lessons? Check out the Ed Tech resource page for tips and tricks on blended learning, there are even Peardeck and EduProtocol templates ready for you to use right away!

https://sites.google.com/sanjacinto.k12.ca.us/edtechresources

To use one of the EduProtocol templates select the underlined title below, make a copy, and follow the directions in the slides.



EduProtocols BookaKucha Template

EduProtocols Cyber Sandwich Template

EduProtocols: Iron Chef Template

EduProtocols: Peanut Butter and Jelly (modified Cyber Sandwich f...

BOOKAKUCHA

The book report- redefined, while supporting concepts taught in class.

Supports reading comprehension, fluency, and student presentations.

CYBER SANDWICH

Structured pair share with accountability to deepen comprehension.

Students record notes, compare and contrast topics, summarize, and pair share.

IRON CHEF

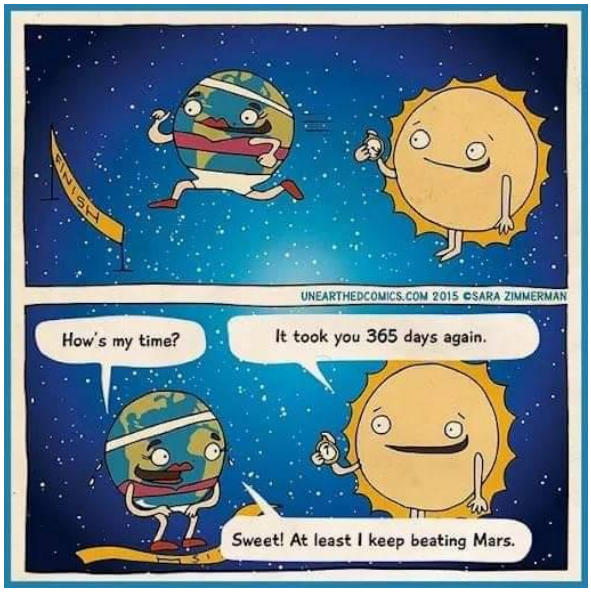
Crunch through content with a gamified jigsaw students are sure to love.

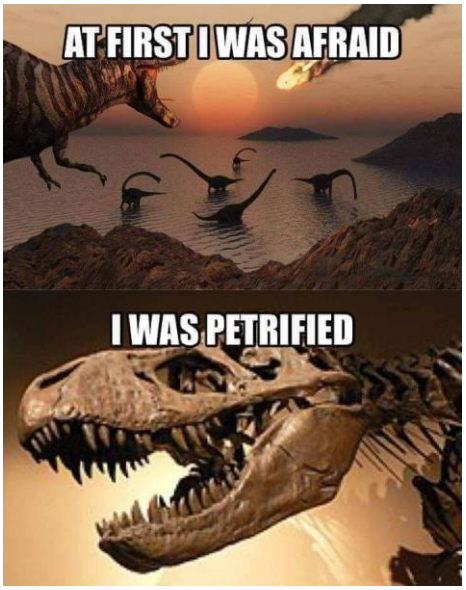
Supports the 4 C's: Collaboration, Creativity, Communication, and Critical Thinking.

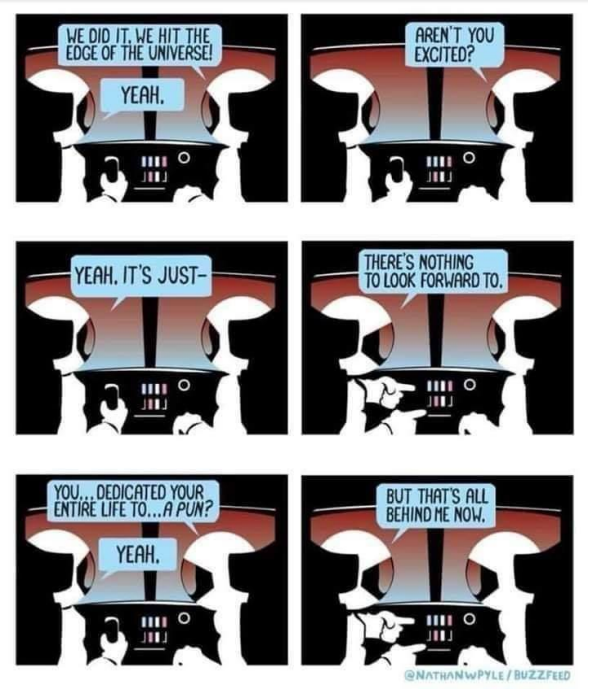
PEANUT BUTTER AND JELLY

Modified Cyber Sandwich for K-2: Eliminate the cut and paste.

Supports note taking, identifying similarities & differences, and students pair sharing.







Contact and Support

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