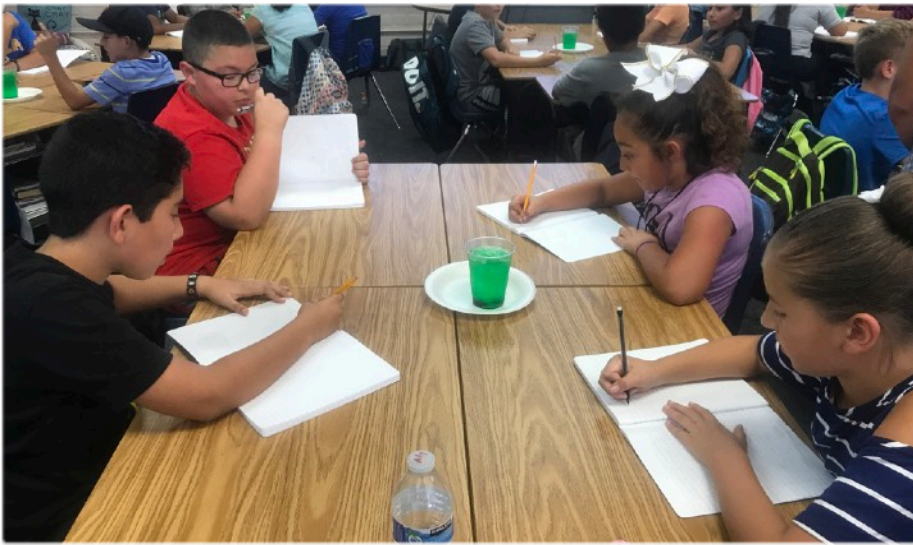


# Stepping into STEM

“The best teachers are those who show you where to look, but don’t tell you what to see.” - Alexandra K. Trenfor



## Here’s the M in STEM!

Have you had the opportunity to check out the awesome math resource, youcubed.org? This website is a gold mine of math tasks and lesson ideas. Specifically, the tasks are classified by concepts, grades (Kindergarten through 12th grade including “low floor/high ceiling”) and math topics. They are highly engaging and encourage students to use their critical thinking skills, as well as communicate their mathematical reasoning. So... you’ve got math talk and cooperative learning opportunities you and your class will love! #goforit



## Tech Corner

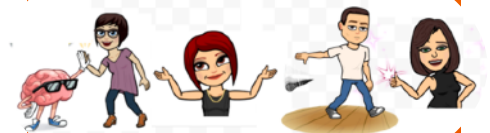
Are your “Tech Help” documents lost in the abyss that is the Google Drive Shared Folder? Are you looking for new lesson ideas to use with your students? Do you wish there was a one-stop shop for it all? Well you are in luck! We have launched a new website, The Tech Desk, to address the needs. Check it out with the link below:

<https://sites.google.com/lcisd.net/techdesk>



### Contributors

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### MATH ON TWITTER

Twitter can be a valuable place for professional development. Each month we will highlight a person or hashtag that supports math education.

@joboaler

### SCIENCE ON TWITTER

Twitter can be a valuable place for professional development. Each month we will highlight a person or hashtag that supports science education.

@ngss\_tweeps



## 5 E Lessons

### Where did 5E come from? What are the 5 E's? What does each E include?

The constructivist theory of learning states learners need to build their own understanding of new ideas. Rodger Bybee and the Biological Science Curriculum Study used this theory when developing the 5E instructional model. One study on the 5E model followed high school students through 9th and 10th grade. After just those 2 years, students taught using the 5E model performed 4 months ahead of their peers. Imagine what that could mean for the LLCSD students with us for 9-10 years!

The 5E's are Engage, Explore, Explain, Elaborate, and Evaluate. An **engage** activity is used to activate students' prior knowledge and focus students' thinking on the chosen topic. **Engage** activities can include: videos, a demonstration, outside observations, a read aloud, pictures, an experiment, etc. Do not feel limited by this list, your **engage** activity simply acts as your hook and begins the class discussion and investigation!

The main goal of the **explore** activity is to provide your students with common experiences so they can begin developing science ideas together. Students can **explore** through experiments (where they choose and test variables), observations (outside observations, pictures, web-based simulations), reading, educational games etc.

Both students and teachers have a role in the **explain** phase. Students verbalize their current understanding through science talks or table discussions. During this phase teachers introduce scientific labels, definitions and explanations of concepts. This does not have to be done through lecture, it can be introduced through informational readings, creating flip books or foldables focused on vocabulary and/or concepts.



When students **elaborate** (aka **extend**) they apply the knowledge, skills, and abilities they have gained so far. It is important for students to continue to discuss

and compare their thoughts during this phase. **Elaborate** activities have a wide range but they all ask students to apply their knowledge to a new situation or scenario. Students construct a roller coaster, bridge, or tower after learning about forces. After learning about water erosion, student are asked to develop a solution to mud slides along PCH. When possible it benefits students to allow them to engineer. However, constructing a solution could also be a written proposal or model in their notebook, a blog, Google Site or Google Slides.

Finally, **evaluate**, this phase emphasizes both the student and teacher assessing the student's ideas, concepts and practices. It is important to have the students reflect on their learning by asking them what and how they learned. This reflection can be done with a quick Google Form or short paragraph in their science notebook. Students informally reflect throughout the 5E process every time we ask them to share their thinking or revise a model. Teachers are also informally assessing students through discussions, class work, and models. However, there is often a formal assessment during the **evaluation** phase. Generally, this is a written performance task. For example, asking students to place a series of pictures in the correct order and explain the process (life cycle, water cycle, photosynthesis etc). The assessment can also ask student to construct an argument with evidence (Will the anteater survive in the grassland? Give evidence for your argument.) This is just a basic summary of the 5E model. For more details or support in creating your own 5E instructional plan please contact Erin Dunroe.

## ENGINEERING ZONE

This month's engineering activities revolve around Thanksgiving. There is only one challenge per grade level span, but the plans are much more detailed than before. The TK-1 engineering scenario asks students to create a disguise for the turkey to help him hide. The 2/3 scenario asks students to build a shelter for the pilgrims who have just landed at Plymouth Rock. The 4/5 challenge asks students to create an escape plan for the turkey. Lesson plan links below:

TK/K/1: [https://docs.google.com/a/llcsd.net/document/d/1bmmz2goE\\_fnLF0KkOH8f63MtI0DahtYL\\_uX6RZUWmDY/copy](https://docs.google.com/a/llcsd.net/document/d/1bmmz2goE_fnLF0KkOH8f63MtI0DahtYL_uX6RZUWmDY/copy)

2/3: <https://docs.google.com/a/llcsd.net/document/d/15Xtbq3fK0fcqcHvzK0oWs9ZzKnp4KwjwoliWANSCDk8/copy>

4/5: <https://docs.google.com/a/llcsd.net/document/d/1r5HiN7FjSjKYjGUV9G3Q24wgvfoW-al21zOYiDgam3U/copy>

