News From TUSD’s Mathematics Dept.

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Rigorous Curriculum Design Unit Updates for TK-6th Grade

Expectations for Year Two Implementation of RCD Math Units
All units have been written, piloted, and taught by TUSD teachers. Now, additional fine tuning of Post Assessments, Unit Planners, and shared Resources will take place.

- **Process for recruiting** Revision Team Members – We are looking for teachers that have the following characteristics:
  - Is knowledgeable about the CA Content Standards and Practices
  - Engages Students in Academic Dialogue about Math
  - Is a team player
  - Implements the RCD Math Units
  - Maintains a Growth Mindset
  - Has Embraced the new shifted instructional practices

- **Revision Teams** Orientation will be provided by Lori Cook this summer and release days will take place throughout 2017-18

- **Anticipated changes**
  - User Friendly Post Assessments and Answer Keys
  - Explicit Examples of the Practices and what they look like when they live in a unit.
  - Updated Pacing (in the Units and in the Year-at-a-Glance documents)

- **Shared Resource Folders** (populated with anchor charts, visuals, vocabulary cards, and activities)

- Next Year’s **Mathematical Support for sites** will be brought right to your campus! Professional Development staff members will visit each site and work with the administration and site staff members to provide workshops tailored to your needs.

If you believe that you have what we are looking for and you wish to be involved with the Math RCD Revision Teams, please contact your principal, Deborah Coker (Elementary Math TOSA), or Melissa Beattie (Director of Staff Development).

Future District ERMs Days you don’t want to miss!
Come delve into the California Content Standards with your allies in learning! Discover new strategies! Discuss practices! We are “digging deeper” on these ERM days. Design Teams will lead the charge in identifying key strategies. **We are being responsive to student needs!**

**Monday, March 20th ~ Math Emphasis**
The Fluid Process of Teaching
Rigorous Curriculum

Maintaining a Growth Mindset

What did you learn today? Experiences in life can lead to new learning...that is up to us. If we allow these experiences to teach us something new we are promoting self-growth and developing a better understand of ourselves and the world around us. It is our mindset that makes this choice. In “Mindset: The Psychology of Success,” Carol Dweck states, “Mindset change is not about picking up a few pointers here and there. It’s about seeing things in a new way. When people...change to a growth mindset, they change from a judge-and-be-judged framework to a learn-and-help-learn framework. Their commitment is to growth, and growth takes plenty of time, effort, and mutual support.” And Staff Development is here to support you, and each other, as we go through this challenging process. Yes, as Dr. Dweck says, “Becoming is better than being.”

Number Talks: What’s the Buzz?
Number Talks build numerical reasoning. According to Sherry D. Parrish, math guru and author of Number Talks, the use of Number Talks in the classroom has been found to, “Strengthen accuracy, efficiency, and flexibility with these mental math and computational strategies.”

No wonder TUSD has partnered with SJCOE in order to bring this practice into our schools. All Math Cadre members have received training this year from SJCOE math experts Satinder Singh and Matt Haber. Cadre members received the Number Talk book, professional development trainings, and a cycle of lesson studies where they applied their learning to their own instruction. Ask the Math Cadre members from your site about the benefits their students have experienced.

This practice is based upon the work of Fennel and Landis(1994)“...an awareness and understanding about what numbers are, their relationships, their magnitude, the relative effect of operating on numbers, including the use of mental mathematics and estimation.”

In addition, Tiffany Gonzales (TOSA), has begun working with both Kelly and McKinley Schools through professional development trainings and classroom demonstrations. Tiffany also provided two full day sessions around Number Talks for middle school teachers during our Buy Back Days.

Next year, she will be providing Number Talk support to Freiler, Jacobson, McKinley, and Hirsch elementary schools.

“Tiffany, Thank you so much for visiting our class and doing Number talks with us. It was very helpful for me to visualize how to structure Number Talks around the lessons that I am teaching. I appreciate your tip to extract/review content specific vocabulary from Math Talks. And as I was looking over your prep paper, I realize that you go into Math Talks with certain expected outcomes, kind of guess what students might say and plan what your response to that is going to be and where you can take them from there. (Correct me if I’m wrong.) We will be incorporating more number talks into our Math lessons. The kids loved it....and they loved you:) Thank you! ~Miena Thokkadam”
“The Art and Science of Teaching / Representing Knowledge Nonlinguistically”

Robert Marzano is a highly regarded instructional researcher. In the article mentioned above (2010), Marzano highlights the powerful aspects of this instructional strategy that make it one of the most highly effective. Nonlinguistic representations are powerful in any content area, as well, not just math. In over 129 studies, the students that were taught with nonlinguistic strategies (graphic organizers, sketches, pictographs, models, etc.) evidenced a 17 percentile point gain over those students who were taught without nonlinguistic strategies.

Five Points to Keep in Mind

1. **Nonlinguistic representations come in many forms**– this depends on the content being taught and the amount of time available.

2. **Nonlinguistic representations must identify crucial information**– or the student will not benefit. “To highlight important information in a story the class is reading, students might be asked to draw a pictograph that illustrates the action. However, if a student draws a pictograph that represents the main characters– but not the central actions that occurred among those characteristics– the representation will not add much to the that student’s understanding.” So in **mathematics**, the teacher acts as a facilitator pointing out **connections** that the **math model** must depict so that understanding is achieved and the model has relevance to the students.

3. **Students should explain their nonlinguistic representations**– Marzano states, “Creating a nonlinguistic representation helps students deepen their understanding because it requires them to think about the content in new ways. Asking students to explain their representations promotes even greater understanding.” The use of academic discourse, among all ages (even as young as 4 yrs old), can lead to misconceptions that students can see as they go and self correct and/or teachers can address erroneous trains of logic and help students regain their equilibrium.

4. **Nonlinguistic representations can take a lot of time**– Since it takes time for students to implement all aspects of their use, it is important that they be used for crucial content.

5. **Student should revise their representations when necessary**-

Support Materials for Implementation of Nonlinguistic

- **Teaching Student Centered Mathematics Black Line Masters**
  
  TSCM is a strong resource for teaching conceptually. They have included access to black line masters that go along with the instructional strategies and activities they suggest. **The code is in the front cover of your book.** Go to this site and follow the directions. [http://pdtoolkit.pearson.com](http://pdtoolkit.pearson.com)
  
  You can also find little graphics of the BLMs in the back of your book.

- **Math Models**
  
  - **Math Models Folder** on Common Core Math—You will find downloaded ENY model files there.
  
  - Illustrations can be found throughout the **CA Framework**. These are in the “OOBinder”folder of Common Core Math

- **Strategy Posters**
  
  - Strategies are being identified, discussed, and documented into posters at our District ERM days. The next day will be Mon., March 20th.
  
  - Submitted photos of posters will be posted to Common Core math—send to dcoker@tusd.net
Supporting Student Learning
Instructional Delivery

Engaging Learning Activities and Performance Tasks
“A rigorous, 21st-century curriculum ought to provide students with a dynamic blend of customary learning activities and authentic and engaging learning experiences.” -Ainsworth Ideally, we are giving our students **incremental learning experiences** that are designed to help them **make their own connections** to the standards in focus while developing both conceptual understanding (concept) and procedural understanding (skills). The tasks our children engage in must “incorporate active participation, not just passive listening and seeing, as they exercise the full range of thinking skills. **Aided by task-specific scoring guides** that give **explicit criteria** [rubrics] for producing a quality product or performance, **students are able to continually self assess and reflect upon what they are learning.**” pg. 161-162

Rigor -ous Curriculum Design

Look for and/or create Performance Tasks to deliver with your instruction. An authentic tie in to the students’ lives gives a level of engagement that is hard to beat. It is an incredibly powerful instructional model and one worth exploring. Some grade levels have begun infusing their units with polished Performance Tasks, while others will be uploading identified tasks in the coming year. A simple search for **Performance Tasks** in the k-5 **ConnectEd** site is one way to get started. Two other excellent resources are **www.cpalms.org** and **Georgia Standards.org**.

TUSD Math Teachers
On Special Assignment a.k.a. TOSAs

We have three Teachers on Special Assignment (TOSA) in the Staff Development Department and they are here to support you: Deborah, Tiffany, and Elisavet.

The Staff Development Department currently encompasses the following programs to support teachers: **The Teacher Induction Program** (all new hires to TUSD), **Tracy Induction** (Formerly known as BTSA– teachers working toward clearing their credentials), and **K-12 Mathematics**.

Staff Development is here to support you!

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Winter 2016-17, Edition 5