Snakes, Spiders & Math

There are three things most people are afraid of: snakes, spiders, and math. These fears have long plagued man. One cause of this fear is math anxiety. Research has shown that math anxiety stimulates the same area of the brain that activates when encountering snakes and spiders (Young, Wu & Menon, 2012). Young, Wu, and Menon studied brain scans of children experiencing math anxiety and found that activity is reduced in the information-processing and reasoning areas of their brains. Also, the amygdala, a region of the brain responsible for processing negative emotions, becomes hyperactive at the expense of the dorsolateral prefrontal cortex and posterior parietal areas of the brain needed for mathematical reasoning (2018). According to their study, these two areas of the brain are connected; math anxiety interferes with a student’s ability for mathematical performance and reasoning.

Second/Foreign Language Anxiety

Understanding the role and the importance of math anxiety in math instruction is important in helping students understand and perform mathematics, however, language acquisition anxiety may also be present when English learners are being taught to read, communicate, and write in mathematics.

Anxiety associated with learning a second or foreign language is considered a multidimensional phenomenon (Hashemi, 2011). It can be defined as “a subjective feeling of tension, apprehension, nervousness, and worry associated with the arousal of the automatic nervous system” (MacIntyre & Gardner, 1994). According to Horwitz (1986) feelings of second/foreign language anxiety target the two fundamental requirements of foreign language learning, listening and speaking. Recognizing anxiety is a psychological construct, likely stemming from the learner’s self-perception as an intrinsic motivator (Hashemi, 2011); math and second language anxiety is a compound hurdle for English learners in mathematical instruction and an important factor in developing a learner’s mathematical language. Recognizing the role anxiety plays in students’ learning led us to consider ways to help our students overcome it.

The Language of Mathematics

Mathematics is a modern and specialized language with concepts and symbols that...
Planning for the Bridge in a Chinese-English Dual Language Program

by Dr. Ying Fiona Du—Chinese Interventionist, Carver-Lyon Elementary Language Immersion School, Columbia, SC

My school, Carver-Lyon Elementary, hosts a dual language immersion program in the state of South Carolina. Our program started in August 2016 with Pre-K and Kindergarten classes. We have added one grade level each year and currently offer Spanish and Chinese dual language classes at all grade levels and one Kinder French class. Our program adopted a 50/50 language allocation model—students spend half of the day learning math, science, and literacy taught in one of the three target languages (French, Spanish, or Chinese) and half of the day learning English language arts and social studies taught in English. We have also adopted a biliteracy curriculum that integrates content with literacy development in both languages, and oral language with reading and writing skills.

Our language immersion teachers and their English-language teaching partners work together to teach the learning objectives of each unit. In an effort to more effectively develop our students’ literacy development in two languages, we have recently begun to incorporate Bridge experiences (Beeman & Urow, 2013).

According to Beeman and Urow in their book Teaching for Biliteracy: Strengthening Bridges between Languages, (2013):

The Bridge occurs once students have learned new concepts in one language. It is the instructional moment when teachers bring the two languages together to encourage students to explore the similarities and differences in the phonology (sound system), morphology (word formation), syntax and grammar, and pragmatics (language use) between the two languages, that is, to undertake contrastive analysis and transfer what they have learned from one language to the other. The Bridge is also the instructional moment when teachers help students connect the content-area knowledge and skills they have learned in one language to the other language...An important aspect of the Bridge is that it is two-way. It goes from Spanish to English and from English to Spanish. It recognizes that because bilinguals transfer what they have learned in one language to the other language, they do not have to learn content in both languages, even when they are tested only in English. (p.4)

Based on the theory and guidelines presented in Beeman and Urow’s book and their webinars, where they recommend the Bridge be done at the end of a robust unit of instruction, our school adopted a two-part model for the Bridge and implemented it for the first time a few weeks ago. During the first part, teachers and students create a vocabulary chart for the content unit by transferring what they have learned in the target language to English, or vice versa. For example, a two-column chart of vocabulary on animal classification and habitat was created in the second-grade Chinese language immersion class. The ELA teacher listed key vocabulary on the left side of the chart. The Chinese teacher brainstormed the Chinese equivalent with the students, using visual aids and body language to stimulate students’ prior knowledge and then added those words to the right side of the chart.

In the Kindergarten class, the Chinese teacher pointed to the image of a shape with the Chinese word written above it and led the students in practicing the word in Chinese. The ELA teacher asked the students the name of the shape in English and wrote the students’ correct response next to the Chinese word.

During the second part of the Bridge, the teachers and students work together to create a contrastive chart of similarities and differences between English and Chinese to develop the students’ metalinguistic awareness and support their linguistic approximations in the two languages. For example, in one class the Chinese teacher compared the word formation of some words, e.g., amphibious (amphi-bious) and triangle (tri-angle). As our teachers become more familiar with planning and implementing Bridge experiences, we hope to implement them at the end of each science unit. By next year, our teachers will certainly progress in the knowledge and skills for teaching the Bridge collaboratively.

—continued on page 3—
I created the Contrastive Analysis between English and Chinese to help Chinese biliteracy teachers conduct a linguistic analysis of the two languages to plan for the metalinguistic talk in the second part of the Bridge. Our Spanish-English dual language teams have made great use of the Four Areas of Contrastive Analysis developed by Beeman and Urow (p.142). I was careful to include similarities and differences between English and Chinese in phonology, morphology, syntax and grammar, and pragmatics and cultural preferences of language use. Even though Chinese is not as closely related to English as Spanish or French, there are still some common linguistic features between the two languages that teachers can demonstrate to students during the second part of the Bridge experience. These linguistic connections make Chinese language use so different from English that it is a living document—you are welcome to add your contribution by contacting me at yingfdu@gmail.com. I look forward to your feedback!

### Contrastive Analysis Between English and Chinese

<table>
<thead>
<tr>
<th>Element and Area of Focus</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phonology</strong> (sound system)</td>
<td>1. English is an alphabetic language and one word can have up to five syllables—multi-syllables and one can word have up to five syllables—multi-syllables.</td>
</tr>
<tr>
<td></td>
<td>winter (win-ter, 2 syllables) demonstration (de-mon-stra-tion, 4 syllables)</td>
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<tr>
<td></td>
<td>2. Chinese is an ideographic language with four tones and each word has only one syllable—mono-syllables. Compound words are composed with two-four individual words.</td>
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<tr>
<td></td>
<td>冬 (dong, 1 syllable, winter) 冬天 (dong tian, 2 syllables, win, winter) 示例 (shi lian, 2 syllables, demonstra-tion)</td>
</tr>
<tr>
<td><strong>Morphology</strong> (word formation)</td>
<td>1. Phonetic loanwords from English to Chinese and vice versa from Chinese to English</td>
</tr>
<tr>
<td></td>
<td>bus (巴士) sofa (沙发) McDonald’s (麦当劳)</td>
</tr>
<tr>
<td></td>
<td>jazz (爵士) T-shirt (体恤衫) hamburger (汉堡) marker (马克笔) soda (苏打饮料) chocolate (巧克力)</td>
</tr>
<tr>
<td></td>
<td>功夫 (kung fu) 茶具 (tea set) china (china)</td>
</tr>
<tr>
<td></td>
<td>1. English words are made of twenty-six alphabets that designate certain meanings. The alphabets themselves do not have meanings. table (tale) forest (for-est) love (love) home (home) meal (meal)</td>
</tr>
<tr>
<td></td>
<td>2. About 80% Chinese words are pictophsographic with one element, mostly radicals, indicating meanings or associations of meanings and the other element, sound (音).</td>
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<tr>
<td></td>
<td>人 (ren) 森 (seng) 林 (lin) 家 (jia) 饭 (fan)</td>
</tr>
<tr>
<td></td>
<td>1. Some English and Chinese words have similar morphological patterns. In English, the prefix (前缀) and suffix (后缀) in Chinese. All of them are standard components of certain meanings that are used repeatedly to form words in both languages.</td>
</tr>
<tr>
<td></td>
<td>computer (compute+er) 计算机 (计算机) teacher (teacher) 教师 (jiao shi) writer (writer) 作者 (zu shi)</td>
</tr>
<tr>
<td></td>
<td>actor (actor) 演员 (yuan yin) classroom (class+room) 教室 (jiao shi) playground (play+ground) 操场 (操常) hardware (hard+ware) 硬件 (yin jian) software (soft+ware) 软件 (ruan jian)</td>
</tr>
<tr>
<td></td>
<td>television (tele+vision) 电视 (te shi) birthday (birth+day) 生日 (sheng ri)</td>
</tr>
<tr>
<td></td>
<td>2. The prefix (前缀) and suffix (后缀) in English have the similar function as the radicals (部首) in Chinese. All of them are standard components of certain meanings that are used repeatedly to form words in both languages.</td>
</tr>
<tr>
<td></td>
<td>er, or (person) teacher (teacher) student (student) professor (professor) worker (worker) composer (composer) designer (designer)</td>
</tr>
<tr>
<td></td>
<td>-tion (verb to noun) introduction (introduction) organization (organization) preparation (preparation) implementation (implementation)</td>
</tr>
</tbody>
</table>
|  | 木 (tree/wood) 木头 (木头) 坐 (坐) 椅 (椅子) 心 (heart) 心情 (心情) 感 (sense) 感觉 (感觉)
Strategies That Hang Together: Your New Best Friend

by Jennifer Lisle—Language Acquisition Specialist, Yakima School District, Yakima, WA

First off, let’s address the elephant in the room. You’ve gone through Project GLAD® Tier 1 Foundations (Research and Theory Workshop + the classroom demo), and you think to yourself, “I just spent six days learning this stuff; I should be able to implement it right away. But I feel overwhelmed. I don’t know where to start.” Now, if this is NOT you and you’re implementing all the strategies in one fell swoop, successfully rocking GLAD® in the classroom like a boss…well, then this article is probably not for you. Carry on. You are an educational ninja, and I applaud you.

However, if you’re like me, your journey probably looked more like this: I went to the Research and Theory Workshop, tried my best to listen and absorb, and long about day 2, the strategies all started to run together. I thought, “It’s all good. I’ll see it in the classroom demo and all will be right with my world.” Then…nope. They moved quickly to fit all the strategies in for me to see, and they said MULTIPLE TIMES, “This would be rolled out over 4-6 weeks of instruction…” but somehow, I didn’t hear that. I left with all kinds of ideas and no direction. So, I put that binder on my shelf with the intention of revisiting all the strategies that had been shared, but you know what they say about good intentions… Does this sound familiar to you, dear reader? If so, take heart and read on. We’ve got some work to do, and when you’re done reading this article, you may have a clearer path to attempting some of this magic in your own classroom.

So, let’s fast forward a bit—after 25 years in the classroom, I’m now a language acquisition specialist for my district. Basically, it means that I help teachers with GLAD® in their classrooms, offer PD sessions and refreshers, and work with my department with all things pertaining to multilingual learners. It also means that I’m pursuing my GLAD® Tier III Trainer certification with our local Tier IV trainer and rock star extraordinaire, Bridget Dale. Bridget has given me many ideas and much support toward my work. Then came the gift of Natalie Olague, a Dual Language Education of New Mexico (DleNM) Program Coordinator and Project GLAD® Tier III trainer. As I was trying to find my way in this new position and worrying that my participants would be overwhelmed with too much information, Natalie had a great suggestion: present two strategies that “hang together” or build on one another.

As I planned for refresher sessions, I realized something else—most of our teachers focused only on Focus and Motivation, Input, and Guided Oral Practice strategies—just as I had done myself. Almost no one had linked those activities to the Reading and Writing strategies. So, here are a couple of jumping off points that I think may help you move from input to writing.

1. Identify the standard you are teaching to and pick an Input or Guided Oral Practice strategy that best addresses that standard (or set of standards). For example, if you are teaching life science and students are learning about the life cycle of an animal, a Pictorial Input Chart is a great way to introduce vocabulary and concepts. The color coding of each component of the chart allows for student brain imprinting and supports recall. Or use a Narrative Input Chart to make the text or concept comprehensible to your students. Even though the Narrative Input Chart is intended for a narrative story, feel free to use it with informational text. You might even want to use a Chant that embeds academic content and language into a fun and engaging learning experience. When you highlight vocabulary and support them with images, you bring those charts to life and make core concepts and language accessible. But WAIT! You’re not done. You can’t leave all that rich language hanging on the wall. You need to get the students to put it down on paper. How do we do that? Read on, all you teaching wizards; it’s about to get good.

A Chant introduces key vocabulary; a Graphic Organizer covers key concepts; a Learning Log provides an opportunity for students to reflect.

—continued on page 5—
2. Pick a Reading and Writing strategy that pairs with your Input or Guided Oral Practice strategy. One of my all-time favorites is the Learning Log. This strategy can connect to almost any other Input or Guided Oral Practice strategy and requires only that you develop a prompt for students to make a text-to-text and text-to-self connection.

3. From there, maybe you establish Expert Groups around the categories of information on your Pictorial. Or, maybe you develop a Process Grid as a whole class and then establish expert groups to learn the information needed to complete the grid. You might choose to have students create their own chant around a different concept of the unit in teams or individually. Or, if you teach the littles in K/1, maybe you’re working on a Whole Class Group Frame pulling information from the Pictorial to develop sentences. Does the Learning Guide recommend that you develop a Process Grid first? Yes, yes it does. Does that mean that you absolutely cannot use it if you don’t have one? **Nope.** As Natalie reminded me: you must ask yourself...what is your goal? Are you modifying the strategy to meet your goal, or are you mutating it? Identify your goal and use the strategy to meet that goal—make sure the integrity and purpose of the strategy stays intact.

4. **Listen,** of course the power of Project GLAD® comes from a whole unit of instruction that beautifully dovetails together and goes from Focus and Motivation all the way to Extensions and Assessments. But whole units are intimidating. Instead, pick two strategies that hang together and refine them. Use them across your core areas. Get in there and get messy and expect that your first time out will not go as planned. It may bomb completely. Then, you’ll pick up the threads and weave a new lesson, refine your practice, and do it all over again.

Another issue that often prevents teachers from tackling an entire GLAD® unit is the issue of **time.** We just don't have enough of it, and when teaching blocks are 30 minute (or less!), the question arises, “How will I fit this strategy in with so little time to do it all?” And the answer is: you **don't have to do it all at one time.** What you saw in the demo where the GLAD® trainer presented an entire Pictorial Input Chart in one session is NOT reality. It was done that way to show you how to present the strategy and what it is supposed to look like when it is complete. The reality is that you can present one color-coded section over multiple days. Present one section one day and another section the next day, and so on. Add sketches and Picture File Cards another day. The deal is this: **the more often you return to and process that one chart, the more your students will learn from it.** It also saves you time—you will prep one chart and get multiple days of instruction out of it. When in doubt, SLOW DOWN. Remember, you are increasing language acquisition and deepening core subject understanding. This takes time. Rome wasn’t built in a day, as they say, and neither will your Input become comprehensible to students if you rush it.

Here are some examples of strategies I’ve used together in various classrooms. All of these lessons were based on the existing district-adopted curriculum for that grade level. The instructional information presented was gleaned from the text and the Literacy Awards were created from the vocabulary in that curriculum. Each of the paired strategies described were rolled out over MULTIPLE days of instruction. A couple of things you won’t see, but were present in every lesson:

* 10/2’s—every time I processed a Chant, a chart, or other form of input, my students needed time to process that information. So, I would pause and provide a prompt for my students to turn and talk.
* I used Literacy Awards with Scouts to reinforce the Three Personal Standards or whatever behavior expectations the school or teacher used.

In the Kindergarten example pictured on page 4, I used a Chant, a Graphic Organizer and a Learning Log based on a weather unit that came from the science curriculum. Please note the color chunking on the graphic organizer—ideally done over many days, one section at a time.

The 1st grade example below shows two strategies that worked well together. First, the teacher taught a science unit on space and objects in the sky. We created a Mind Map from the information the teacher front-loaded using the text from the curriculum. That information fed into a Cooperative Strip Paragraph. At the time that I took the picture, more revisions were needed. The teacher had 20-minute time blocks to focus on science, so we spread the lessons out over a week.
Hello! My name is Berenice and I am a student in a dual language middle school in Albuquerque, NM. When I enrolled in 6th grade, I was not part of the dual language program, but I asked my mom to move me into the program at the beginning of 7th grade. My cousins are in the program and they talk a lot about how much they are learning and how much fun the teachers are! I have always spoken Spanish at home, but I was never enrolled in a bilingual program in elementary school. Maybe it’s because I was born here, but I sure wish I had been able to participate in one. My first years in school were not easy—my family didn’t speak English and my teachers didn’t speak Spanish. Now, as an 8th grader I’m excited to be using both languages in school and be able to present a bilingual portfolio at the end of the school year.

8:15-9:16 AM - 1st Period - Estudios Sociales

Mi primer periodo es con el Sr. Sánchez. Antes de empezar la clase me pregunta por mi mamá; él se enteró que se lastimó un brazo en el trabajo. Para comenzar la clase, el Sr. Sánchez proyecta una pintura en el pizarrón. Dice que se llama Progreso estadounidense de John Gast de 1872. Nos pide que con la persona que está a nuestro lado describamos lo que vemos. Luego nos pide que compartamos nuestra conversación. Yo levanto la mano y digo que veo un ángel que flota desde el este hacia el oeste, que sostiene un libro y un cable del telégrafo. Mi compañera Eva dice que también hay indígenas sin camisas, y que un lado es más oscuro que el otro. El Sr. Sánchez nos dice que esta idea de que los colonos de EE.UU. debían mudarse al oeste y tomar la tierra de los nativos americanos se llamó Destino manifiesto. Es por eso que John Gast llamó a esta pintura Progreso estadounidense, porque el progreso significa que algo está mejorando.

9:20-10:18 AM - 2nd Period - Language Arts

After my social studies class, I go to Ms. Córdova’s class. She always greets us at the door with a big smile and when I ask her, “How is your day going?” She always answers, “It couldn’t be better!” We call her La Jefa!

There are goals and objectives on the board. Last week, the principal considered giving the students a dance, but after some kids were fighting she said that...
she wasn’t sure that we had earned that privilege and was thinking of canceling it. We asked Ms. Córdova to intercede for us, but instead she decided that this was going to be our assignment: the 8th graders will write to our principal and explain why we deserve a dance. Last week Ms. Córdova showed us examples of persuasive texts. We studied examples of letters that justified opinions, created an outline, and wrote our first drafts. Ms. Córdova reviewed our drafts and gave us feedback. Today we will present our letters to the principal. We’re pretty nervous about it, so Ms. Córdova is giving us time to practice reading the letter to one another.

When the principal arrives to the class, some of us volunteer to stand up and read it out loud before handing it to her. After I read my letter, I am sure I did good; I could see Ms. Cordova and our principal smiling. The principal said she will give us an answer by the end of the week after she reads all our letters. We are excited because it seems as if we are succeeding in our quest! Ms. Córdova dismisses the class.

**10:22-11:20 AM - 3rd Period - Matemáticas**

Mi siguiente clase es matemáticas. Cuando entro y me acomodo en mi lugar tengo que ver el pizarrón para saber qué es lo que tengo que hacer. La maestra Gurrola escribe la actividad de inicio y nosotros debemos empezar con eso en cuanto suena el timbre. Mientras la maestra toma lista, me puse a resolver las ecuaciones de la actividad de inicio. Luego, en la parte de arriba de mi cuaderno interactivo escribo la pregunta esencial del día que está escrita en el pizarrón. Hoy estamos aprendiendo a resolver sistemas de ecuaciones usando el método de eliminación. Ya escribí en mi cuaderno el objetivo y la pregunta esencial: ¿Cuál es la diferencia entre resolver un sistema de ecuaciones usando sustitución y eliminación? También tengo que poner preguntas de nivel 1 o 2 en la columna del lado izquierdo de la hoja derecha.

Cuando terminamos, la maestra Gurrola nos da tarjetas con números del 1-4. Escogemos una y a mí me tocó el #2. La maestra nos pide que vayamos a otro equipo de acuerdo al número que nos tocó. En mi nuevo equipo somos seis estudiantes. Ahí nos asigna un ejemplo del libro—hay un problema resuelto y otros sin resolver; nosotros trabajamos en el ejemplo #2. Después de estudiar el ejemplo ya resuelto, dividimos los problemas en dos partes. Cuando terminamos nos explicamos unos a otros los problemas que hicimos y completamos los que faltaron. La maestra camina entre las mesas revisando que no tengamos dudas y ayudándonos. Cuando terminamos el ejemplo y comprobamos las respuestas, regresamos a nuestros equipos.

Al terminar los cuatro ejemplos, la maestra nos da un problema de palabras. Cada persona en el equipo tiene un problema diferente; tenemos que leer el problema y escribir las ecuaciones. Cuando la maestra nos lo indica pasamos la hoja a nuestro compañero de la derecha. Reviso lo que mi compañera escribió y le comento usando enunciados completos si estoy de acuerdo o si le cambiaría algo y porqué. Cuando acabo, tengo que pasar mi hoja a mi compañero de la derecha y repetir el proceso. Jorge, uno de mis compañeros de equipo necesita más tiempo. Y a sabemos que cuando eso pasa, nos brincamos a ese compañero y pasamos la hoja al que sigue, así le damos más tiempo a quien lo necesite. La maestra nos da tiempo de aclarar dudas entre nosotros y luego de pegar la hoja en nuestro cuaderno.

Antes de salir, tenemos que contestar la pregunta esencial—es nuestro boleto de salida. La maestra revisa nuestras respuestas conforme vamos saliendo del salón. Mi respuesta estaba incompleta porque no usé la pregunta en mi respuesta. Tuve que regresararme a completarla; lo bueno es que sigue el receso. La maestra Gurrola también me pregunta sobre mi mamá. Ella conoce a la familia porque fue la maestra de mis primos. Aprovecho para invitarla a nuestra presentación del grupo de Mariachi la próxima semana. Ella siempre va.

{**The students’ persuasive letters worked! The 8th graders got their dance.**}
Making the 3rd Dual Language Goal Real with Teacher-Created Curriculum

by María Treviño and Toby Rose—Briarcrest Elementary School, Shoreline, WA
with Natalie Olague and Diana Pinkston-Stewart—DLeNM

The three goals or pillars of Dual Language Education are (1) Bilingualism and Biliteracy, (2) High Academic Achievement, and (3) Sociocultural Competence. With such a strong focus on the academic goals, the 3rd goal—all DL students will demonstrate sociocultural competency, has sometimes been overlooked. One reason may be because it is difficult to demonstrate something so complex and abstract. Howard et al (2018) define sociocultural competence as including identity development, cross-cultural competence, and multicultural appreciation. DLeNM’s work with DL programs throughout the nation has uncovered an additional layer of this 3rd goal, especially in the current sociocultural context in which we find ourselves: demonstrating critical consciousness, or “the ability to recognize and analyze systems of inequality and the commitment to take action against these systems” (Friere, 1968).

Briarcrest Elementary in Shoreline, WA has 444 students. In 2017, we started a dual language program at kindergarten and 1st grade and have added a grade every year. There is currently one dual language class in each grade from kindergarten through 5th grade with a total of 130 students. In 2019, Briarcrest DL staff participated in an El Enriquecer program planning retreat with DLeNM and Teaching for Biliteracy professional development with Karen Beeman and Cheryl Urow. The DL teachers then got together to develop units using the Biliteracy Unit Framework (BUF). BUFs feature six instructional stages that provide the integral skills and information that lead to the development of biliterate students (Beeman & Urow, 2013). We decided to develop our units with a focus on supporting students in attaining the 3rd goal of DLE in science, social studies, and language arts content. As a result of the move to online learning during the pandemic, DLeNM partnered with Briarcrest DL teachers to modify the previously developed units to be used online. During this process it became clear that the integration of Project GLAD® strategies into the BUFs would greatly enhance the units and provide the most effective DL learning - online or in-person. In essence, we “GLAD®ified” the BUFs! With the “what” clearly defined in the existing BUFs, we focused on the “how” using Project GLAD® strategies built on the notion of a gradual release of responsibility.

Kindergarten Unit: Advocating for Myself and Respecting Others – Sra. María Treviño

The Learning Targets for this unit are:

- Language Arts Content - I can tell how characters in a story are different. I can tell how characters in a story are the same.
- Language Focus- I can use compare and contrast vocabulary to talk about the characters in a story.
- Sociocultural Competency (3rd goal of DL) & Social Studies Content - I can make connections between the story’s characters and my own personal life experience (identity development). I can have a different opinion than my classmates and still be respectful (cross-cultural competency).

Sra. Treviño started the unit with several Project GLAD® strategies that provided the students with multiple entry points:

- Observation Charts to access their prior knowledge,
• an Inquiry Chart focused on communities (¿Qué sabes de las comunidades? ¿Qué te preguntas sobre las comunidades?) to focus and motivate students as we began our unit of study and provide me with a sense of what my students already knew,

• a Picture Dictionary to define three different types of communities - la ciudad, el vecindario and el campo and introduce key vocabulary, and

• a Communities Graphic Organizer Input Chart to directly teach unit concepts.

These scaffolds served to prepare the students for the main reading selection: Querido Primo by Duncan Tonatiuh (2010). Querido Primo was delivered as a Narrative Input Chart; preselected images from the book were animated electronically while I read the story aloud. The animation first showed a screen-sized picture and then placed the picture on a setting background so that students could see the story unfold. The images below show this process, which was used because of the limitations of online instruction.

As part of this BUF, a Bridge experience was planned—an intentional point at the end of a robust unit of study in which teacher and students together transfer concepts and vocabulary from one instructional language to the other (Beeman & Urow, 2013). Vocabulary and comparison words from the Comparative Input Chart were transferred from Spanish to English. For the extension activity into English, students were asked to name their favorite game. Their responses were used to build comparison sentences.

For the next part of the unit, Ms. Treviño used a Comparative Input Chart to compare the two main characters in the story and practiced “walking” the chart and building comparative sentences. Words and pictures on the Comparative Input Chart were pointed out and students practiced writing their own comparison sentences and recorded themselves reading them aloud on Seesaw.

As Ms. Treviño reflected on implementing this unit with the integrated GLAD strategies, she noticed that her students were more engaged (even with them being online!). The strategy design provided access for kids at all language levels, and Ms. Treviño was able to see what the kids learned regardless of their writing skills (i.e., the students could draw a picture and record themselves reading...
must be learned (Esty, 2022). Similarly, even if you can do some math, you may not be able to read math. According to Esty (2022), to be fully proficient in the symbolic language of mathematics you should be able to efficiently read, write, learn, and think mathematical thoughts. Developing the language of mathematics is an essential aspect of teaching mathematics to students and continues throughout an individual’s mathematics education (Riccomini, Smith, Hughes & Fries, 2015).

The Gateway to Mathematics

When I first started college, I struggled with understanding math. I had dropped out of high school and had not received the mathematics instruction my classmates had received, so to describe me as lost in math would be considered an understatement. I was a few years younger than my classmates, but I knew the importance of getting a college education. I had to find a way not to fail again. It was during my second attempt at basic college math that I realized I could not interpret what the math professor was saying. I could not connect linear equations, functions, or distributive properties to any prior knowledge I had. One day, I was flipping through the pages of my math books and, in the back of the book, I found a mathematical glossary. It became the cipher I desperately needed for the language of mathematics. I studied the math words intensely. I attached the words to the pictures. I tried to use the words in sentences, speaking them out loud, and finally connecting them to mathematical strategies and properties.

The Cipher: Mathematical Vocabulary

Providing appropriate academic language support is important for all learners, especially in the mathematics classroom, where the ongoing development of explicit mathematical vocabulary is essential (Bay-Williams & Livers, 2009 cited in Riccomini, et al., 2015). There are three main purposes for teaching essential vocabulary in mathematics. According to Riccomini, et al. (2015), the first is to provide initial instruction to promote the understanding and storage of word meanings in long-term memory. Second, and only after students have developed that understanding, the goal becomes to help students become fluent and maintain the words’ meaning over time. Third, the result of achieving the first two goals is that students can easily and accurately use the language of mathematics to explain and justify mathematical concepts and relationships. Without the instructor first teaching basic understanding and facilitating fluency with vocabulary words, the purposeful and effective use of the language of mathematics will not occur (Riccomini et al., 2015).

Vocabulary supports comprehension. However, approximately 70% of students in middle and high school experience difficulties with vocabulary and reading comprehension (Biancarosa & Snow, 2004). All students, including English learners and students with learning disabilities, benefit from explicit vocabulary instruction. A focus on mathematical vocabulary helps students explain, justify, and otherwise communicate mathematically and is important to the overall development of mathematical proficiency.

Math Poets

During an early morning ride to school, my wife, who at the time happened to be an awesome 6th-grade math teacher, discussed with me this trifecta of a problem; the acquisition of the language of mathematics, the fear and anxiety of mathematics, and English learners acquiring a third language: math. I shared with her my story of how I found a cipher to the language of mathematics in the glossary at the back of my college math book. She in turn, shared her experiences acquiring English as a first-generation English learner. During that early morning drive, we developed a creative poetry lesson to help our students develop mathematical vocabulary. This activity promotes the language of mathematics through artful expression and reduces the fear of mathematics.

Lesson Preparation

We began this activity by clearly defining our math objective in which students would be able to connect math terms to the real world. Our language standard indicated students use clear definitions in discussion with others and in their own reasoning. WIDA’s English Language Development (ELD) Standard connecting language development and academic content learning was addressed by having all students, including the English learners, communicate information, ideas, and concepts that are necessary for academic success in the content area of mathematics.

Materials/Key Vocabulary

This cross-content activity required the frontloading of key vocabulary terms and the introduction of the structure of a poem to help students in this activity. These structures, or elements of poetry, include meter, rhyme, scheme, verse, and stanza, which were important vocabulary terms to introduce. Visual examples and graphic organizers displaying poetry.
—continued from page 10—
elements supported students with the background knowledge needed to participate in this math activity.

Motivation
We began the lesson by referencing the math word bank that every student in our school has and asking them to list math words they remembered from kindergarten to their present grade level. They were then asked to cross out any word that they were not able to define orally. Once the students had individually written their math vocabulary list, a math poem, supported by images, was read to them. Vocabulary was reviewed and explained through the visual representation and discussed as a whole group. Stanzas and verses were emphasized, while rhyme, meter, and scheme are mentioned but not highlighted. The students were then given the task to create their own Math Poem using their list of math vocabulary words. Students used various tools to verify the meaning of words.

This activity required students to make numerous edits. They were required to edit grammatically and verify that the math terms were used appropriately. Students read their math poems over and over again and edited accordingly in order to meet their personal standard of excellence. Once all students completed their math poem, a gallery walk provided an opportunity to applaud others’ work. Students who wanted to stay anonymous wrote their names on the back of their poems, while others offered an alias to hide their identity.

The importance of vocabulary development in any language is crucial in learning how to write, speak, and understand mathematics as a language. Van der Walt (2009) emphasized that vocabulary within the language of mathematics is an aspect of instruction that requires specific attention. We have discussed the importance of recognizing anxiety prior to instruction and its impact on learning. The activity presented promotes mathematical vocabulary development using a cross-content activity that incorporates instructional best practices and may help engage students in mathematics in contrast to more traditional computational approaches.

References
Syntactic and Grammar (sentence structure)

1. English uses verb conjugations (動詞變化) to denote different tenses, voices, modes and singular vs plural. Chinese has no verb conjugations. Instead, it uses time phrases (時間詞) and particles (助詞) or auxiliaries (助動詞) to denote above differences.

Tense 

**I go** to school every day. (present tense 現在時)
**I was** going to school the next week. (past tense 過去時)
**I am going** to school this morning. (present perfect tense 現在進行時)
**I have** been to school for two years. (present perfect tense 現在完成時)
**I will** go to school next week. (future tense 將來時)

Voices

**I turned on the light** a moment ago. (active voice 主動態)
**The light was turned on** by someone a moment ago. (passive voice 被動態)
**The light has been turned on already.** (passive voice 被動態)

Voice 

**I eat breakfast at 7:15 every morning.** (adverbial phrase of time is after verb)

Structure

**I eat breakfast at 7:15 every morning.** (adverbial phrase of time is after verb)

Languages

• English and Chinese have different sentence order 詞序 when it comes to interrogative sentences (疑問句), adverbs/adverbal phrases of time, place and manner (時間、地點、方式狀語).

Interrogative Sentences (疑問句)

Is this answer correct? (subject and verb reversal 主謂逆轉)

Are you sure? (subject and verb reversal 主謂逆轉)

Who is he? (subject and object reversal 主賓逆轉)

What did you do? (subject and adverb reversal 主狀逆轉)

Adverbs of Time, Place and Manner (時間、地點、方式狀語)

I eat breakfast at 7:15 every morning. (adverbial phrase of time is after verb)

I go to school every day. (adverbial phrase of place is after verb)

I go to school by bike. (adverbial phrase of manner is after verb)

English uses clauses (從句) to denote the attributive qualities to subjects or objects whereas Chinese uses particle 的 (助詞) to denote the same relationships.

The student who is sitting next to the teacher is a 4th grade student. (attributive clause of subject 主語定語從句)

The books on the desk are Chinese. (attributive clause of object 客語定語從句)

2. English uses clauses (主語定語從句) to denote gender difference and plural while English uses different words to denote these differences.

Gender

he
she

 Singular and Plural 單複數

I
we

3. English uses the plural noun (名詞複數) by adding “s” to the noun whereas there is no distinction between singular and plural nouns themselves in Chinese. Instead, it uses a number + measure word (數字 + 量詞) to indicate the number of the object. She has a book.

She has two books ( 's for plural)

4. English and Chinese have reversed sentence order regarding space and time (空間與時間關係)

Space (地點/場所)

2100 Waverly St, Columbia, SC 29204, USA (from small to large location)

Time (時間)

Monday, February 14th, 2022 (from small to large time)

Reference

I arrive to Mr. Lobo’s science class. Last week, we worked on how elements can be transformed and the importance of oxygen in our lives. We are seated in teams of four at the lab tables. Mr. Lobo rotates our teams each unit. He has the instructions on the board, and we have our notes at our table. We are going to do an experiment to learn about chemical decomposition reactions. On the board it says that a chemical decomposition reaction is when one reactant breaks down into two or more products. Mr. Lobo also points to our class cognate chart and explains how the word *decomposition* is a cognate.

Each person in our team has a different job—Director, Materials Manager, Technician, and Facilitator. We rotate jobs for every experiment. Since I am the material manager and my friend is the facilitator, we get to pick up the materials:

- Sodium Hypochlorite (Na ClO) and hydrogen peroxide (H2O2)
- A beaker, matches, and a wooden stick
- Plastic gloves, goggles, a dish, and paper towels

David is the technician, so he pours 50 ml of bleach into the beaker and then tells Stephanie to add 25 ml of hydrogen peroxide. There are bubbles forming and the beaker feels a little warm! David carefully lights the wooden stick with matches and then blows them both out. When I put the stick next to the beaker it makes a funny noise and the solution begins to glow. Smoke even starts coming from the beaker! Mr. Lobo reminds us that this is proof that extra oxygen has been released from the oxygenated water. He writes the chemical equation on the whiteboard:

\[
2 \text{NaCl (bleach)} + 2 \text{H}_2\text{O}_2 \text{(hydrogen peroxide)} \rightarrow \text{NaCl (salt)} + \text{O}_2 \text{(oxygen)} + 2 \text{H}_2\text{O (water)}
\]

My team and I clean up our tables and put the materials back in their place. For my exit ticket I need to answer these questions:

- Doing this project allowed me to learn 
- I would like to improve this experiment by doing the following:
- What I liked most about this experiment was

As I leave the class, I place my ticket in the tray for our 4th period classwork.

—continued from page 7—

1:00-1:58 PM - 5th Period - PE

This semester I had to take PE as my elective—I need it in order to get promoted to high school. I had Mariachi last semester, which I loved! Since I can’t take Mariachi as an elective, I stay after school on Tuesdays and Thursdays for the Mariachi afterschool program.

We start our PE class stretching our legs. Then, Coach gives us the directions for our next activity. We are going to be running relay races! Coach set up running lanes with orange cones and showed us where the exchange zone is so that both runners are moving when they pass off the baton. Coach divides us into teams of four and has us decide our numbers. We must run in the right order. That took a little negotiating—we had to remember who the fastest runner was on our team. My team got off to a great start, but in the end we lost. It didn’t matter though because we had a lot of fun!

Once we finish, we open our journal and write for two minutes answering the question: “how could you train to improve your team’s chances at winning?” We need to write at least a paragraph. I write about strengthening my leg muscles and practicing the best way to hold the baton. Coach then has us make two circles, one that faces inside and one that faces outside. He tells us to share our reflection with the person we are facing. I get to talk to my best friend Briana. Coach blows her whistle and has the outside circle move over one person. Now I get to talk to Aldo. It takes us a while to start talking, but we manage to share ideas. Before the bell rings, we go to our lockers to change. On my way out I turn in my journal and head to 6th period.

2:02-3:00 PM - 6th Period - Artes del Lenguaje de español

Mi última clase del día es con la Sra. Aranda. Empezamos viendo un video sobre oficios y profesiones y qué nos gustaría ser cuando seamos adultos. La maestra Aranda detiene el video en algunos segmentos y nos hace preguntas. Nos pide que reflexionemos y contestemos las preguntas en nuestro cuaderno. Al mismo tiempo ella anota las palabras nuevas en el pizarrón. Las preguntas que nos hace son:

¿Cuáles son las características principales que diferencian una profesión de un oficio?

—continúa en la página 14—
¿En qué escuela se estudia para ser técnico o profesional?

¿Son capacitación y entrenamiento lo mismo?

Para cada pregunta, la maestra nos pide que usemos enunciados completos—es decir que incluyamos la pregunta en la respuesta.

La maestra nos reparte dos palabras de vocabulario nuevo. Por cada palabra tenemos que escribir un enunciado completo, dibujar el oficio y escribir un párrafo sobre si esa profesión nos gusta o no nos gusta y en qué escuela se estudia para eso. La maestra me dio las palabras “Abogado” y “Farmacólogo”. Abogada sí me gustaría ser, pero no creo ser farmacóloga. La Sra. Aranda nos dice que vamos a compartir nuestras respuestas una por una con un compañero. Cuando escuchemos la música vamos a caminar alrededor del salón y cuando la música se detenga, necesitamos encontrar a un compañero y compartir nuestro trabajo. Ella pone una canción de Christian Nodal, ¡Mi cantante mexicano favorito! La música nos hace bailar y cantar a todos. Repetimos este proceso tres veces más. Ahora en equipo, tenemos que escoger dos oficios y dos profesiones que nos gustaría seguir y escribir dos párrafos explicando cuáles son los requisitos en cada una de esas profesiones y oficios. La maestra nos pide que usemos estos enunciados auxiliares para empezar cada párrafo:

“Cuando sea grande me gustaría tener la profesión/oficio de _____ , porque __________.”

“Para esa profesión/oficio tengo que estudiar en __________, por _________ años.”

En equipo hicimos el borrador y ahora tenemos que hacer nuestro trabajo final individualmente.

Antes de terminar la clase, la maestra nos da una rúbrica para el proyecto final. Para la siguiente clase tenemos que traer una lista de profesiones y oficios de personas que conozcamos. El proyecto final será una investigación más a fondo de las profesiones/oficios más populares en nuestra comunidad. ¡Suena muy interesante!

3:10-4:00 PM - After School

Today I don’t have the after-school Mariachi program, but I am going to be part of the tryouts for soccer. I hope I make the team!

—continued from page 13—


Dual Language Education of New Mexico Has a New Executive Director!

After 25 years, DLeNM’s founding Executive Director, David Rogers, has chosen to move into a support position within the organization to make room for the next generation of transformative leadership. With that goal in mind, the Board of Directors is proud to announce that Michael A. Rodríguez will take over as DLeNM’s Executive Director on July 1, 2022.

Michael began his collaboration with DLeNM in 2003 as the Assistant Principal of Agua Fria Elementary School in Santa Fe, and again in 2009 as Director of Cien Aguas International School in Albuquerque. In the spring of 2016, he officially joined DLeNM’s leadership as Director of Operations, a position he has held until now. As a 25-year educator and native New Mexican, Michael knows first-hand the importance of honoring students’ cultures and languages and has developed his passion and expertise for dual language education through his experiences as a parent, teacher, administrator, and program development specialist. Michael is exceptionally well prepared to lead DLeNM in realizing its mission to develop, support, and advocate for high-quality dual language education in New Mexico and beyond.

Congratulations, Michael! The DLeNM Board of Directors is excited for the organization’s future and looks forward to many productive and exciting years of collaboration with you as our next Executive Director.

¡Seguimos con la cosecha!
Next, during this teacher’s English Language Arts time, we retold the classic story of Goldilocks and the 3 Bears using a Narrative Input Chart with story cards, speech bubbles, and vocabulary words. The Narrative Input Chart fed into a Story Map, which could be extended into an individual or team writing task, depending on student ability and teacher preference.

In a 5th grade class, I used a “Here There” Chant, which fed into an SPC and a student extension of the chant. While I was in that classroom, we completed only these two strategies. The student extension of the chant was ready to be completed the next day.

For high school juniors, my colleague María Chávez Ceja and I helped the English teacher make a novel about WWII soldiers from the Laguna Pueblo more comprehensible for students. We used a Narrative Input Chart to retell the novel, and then a Learning Log to connect the subject matter back to the students. The main character in the story experienced bicultural ambivalence, which provided the prompt for the text-to-self portion of the learning log. Powerful!

GLAD® doesn’t have to be an all or nothing approach. You can take the strategies chunk by chunk and make them work for you. Don’t allow yourself to be intimidated by the scope, sequence, and number of strategies that are listed in the Project GLAD® Learning Guide. That guide is meant to be a resource that fine-tunes your teaching practice, takes student learning to the next level, and provides scaffolds for students to develop both language and core content. Every time you employ a GLAD® strategy in your instruction you are making language and content more comprehensible. It’s time to move to the next level and hook those reading and writing strategies in. You’ll soon find that you are able to assess student progress and provide more targeted re-teaching and refinement.

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FEATURED SPEAKERS INCLUDE:

Ester J. de Jong
Dr. Alma Flor Ada
US Secretary Deb Haaland
Dr. José Medina
F. Isabel Campoy

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Early Registration Deadline
July 15, 2022
Schedule-at-a-Glance
Wednesday, November 2nd
6:30 a.m. – 2:30 p.m. School Visits*
8:30 a.m. – 3:00 p.m. Pre-Conference Institutes*
12:00 p.m. – 5:00 p.m. Early Check-In
1:00 p.m. – 5:00 p.m. Exhibits Open
5:30 p.m. – 7:00 p.m. Opening Session (Live Stream)
7:00 p.m. – 8:30 p.m. Opening Reception & Night at the Exhibits

Thursday, November 3rd
7:30 a.m. – 3:30 p.m. Check-In
7:00 a.m. – 5:00 p.m. Exhibits & Career Fair
9:10 a.m. – 2:50 p.m. Concurrent Sessions
12: 15 p.m. – 1:15 p.m. Networking Luncheon
3:15 p.m. – 4:30 p.m. Plenary Session (Live Stream)
7:30 p.m. – 10:30 p.m. Conference Dance/Fundraiser*

Friday, November 4th
7:30 a.m. – 11:30 a.m. Check-In
8:00 a.m. – 5:00 p.m. Exhibits & Career Fair
9:10 a.m. – 2:50 p.m. Concurrent Sessions
12: 15 p.m. – 1:15 p.m. Networking Luncheon
3:15 p.m. – 4:30 p.m. Plenary Session (Live Stream)
8:30 a.m. – 3:00 p.m. Student Leadership Institute & Family and Community Institute

Saturday, November 5th
7:45 a.m. – 9:00 a.m. Breakfast with an Expert
9:10 a.m. – 12:15 p.m. Concurrent Sessions
11:30 a.m. – 12:00 p.m. Closing & Pow Wow

*Indicates ticketed event.

Special Events!
Student Leadership Institute & Family and Community Institute

Fundraiser/Dance

Pow Wow

Register Today!

Dr. Kim Potowski
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Dr. Joan Lachance
Barbara Kennedy
Edward Tabet-Cubero

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DLleNM
what they wrote). This unit made the sociocultural competency goal of DLE real because students were able to connect with the main characters (many of them have relatives living in another country) and they really began to understand that we are all different, and that is okay!

4th Grade Unit
Activistas y agentes de cambio
Sr. Toby Rose

Learning Targets:
• Language Arts content - I can determine the main idea of a text and how it is supported by key details. I can refer to details in a text when drawing inferences from the text.
• Language focus - I can use the language of inference to analyze text.
• Sociocultural Competency and Social Studies content - I can make connections between activists’ life stories and my own personal experiences (identity development). I can explain how activists change the world (critical consciousness).

Sr. Toby started the unit with Observation Charts and an Inquiry Chart (¿Qué sabes sobre el activismo? ¿Qué quieres saber sobre el activismo?). Next, he read a Teacher-Created Big Book aloud. The cover and table of contents are shown below.

He then presented a Pictorial Input Chart about Dolores Huerta with images and bulleted information in color-coded categories: Identidad, Eventos importantes de su vida como activista, and Los cambios que provocó.

The Pictorial Input Chart led Sr. Toby to facilitate small Expert Groups. Each Expert Group read and discussed a text about a different activist that included the same categories of information found in the Pictorial Input Chart. Each Expert Group text introduced the students to César Chávez, Alexandria Ocasio-Cortez, Sonia Sotomayor, and Rigoberta Menchú Tum. Each member of the expert team then returned to their home team and taught their teammates about the activist that they had become an expert on. An example of one category of one of the expert group texts used is shown on page 19.
The class then summarized the information learned about each of the activists studied by using the Process Grid strategy.

For the culminating task, each group of students developed a Google slide with information on the activist they thought was the most influential. In the example shown here, a student group chose to write about Dolores Huerta.

The Process Grid allows students to access all the information learned in a unit of study. The categories at the top of the grid are the same as the categories of the Pictorial Input Chart and the Expert Group texts.

In his reflection on the implementation of this unit with the integrated GLAD® strategies, Sr. Tobías noticed that the information was more accessible for all students regardless of their language abilities. The activities were dynamic and interactive and enjoyable for the whole class! This unit made the 3rd goal of dual language education real because many students identified with activists based on their own identity and values, and thus were inspired to talk to family and community about advocating for their values!

The process the bilingual teachers at Briarcrest Elementary followed to develop GLAD® units that led the students to demonstrate sociocultural competency provided embedded professional learning for everyone involved! The teachers engaged in authentic, organic conversations that provided the foundation for these powerful units; something that would not have been possible if the school had been using published curricula. Honoring and investing in DL educators in this kind of work is critical for successful, sustainable dual language programming!

References
Achievement Inspired Mathematics for Scaffolding Student Success (AIMS4S™)—Virtual Institute: June 1-2, 2022.
Designed to deepen your mathematical understanding and support you in addressing students’ mathematical gaps.
For more information and to register, visit www.dlenmsummerinstitutes.org.

OCDE Project GLAD®—Virtual Foundations Certification Training for Schools and Districts:
Part 1: Virtual Research and Theory Workshop: June 1-2 OR June 15-16, 2022
Part 2: 4-Day Virtual Classroom Demonstration:
Elementary level: June 13-16 OR June 20-23, 2022
Secondary level: June 20-23, 2022
For more information and to register, please visit www.dlenm.org/upcoming-project-glad-foundations-tier-1-certification-trainings

Dual Language Education of New Mexico—2022 Hybrid Summer Institute: June 7-8, 2022.
In-person and virtual sessions will support you in building your understanding of both the AIMS4S™ and OCDE Project GLAD® frameworks.
For more information and to register, visit www.dlenmsummerinstitute.org.

UNM College of Education with NM public education dept—Spanish Summer Immersion Institute for Bilingual Teachers: June 1-24, 2022 in a virtual format.
For more information, please contact Dr. Leila Flores-Dueñas at lflores@unm.edu.

UNM College of Education—ESL Endorsement Summer Institute: June 6-July 14, 2022 in a virtual format.
For more information, contact Dr. Carlos LópezLeiva at callopez@unm.edu.

Association for Two-Way & Dual Language Education (ATDLE)—Annual 2022 National 2-Way Bilingual Conference: June 27-29, 2022 at the Riverside Convention Center, Riverside, CA.
For more information, please visit https://atdle.org.

Dual Language Education of New Mexico—27th Annual La Cosecha Dual Language Hybrid Conference: November 2-5, 2022 in Santa Fe, NM with in-person and virtual attendance options.
The website is live for La Cosecha 2022 registration and the most up-to-date information.
Visit www.lacosechaconference.org and make your conference plans now!