Crafting Creative Math Lessons for the Transitioning ELL Student

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Agenda

Time	Duration	Activity
3:00	10 minutes	Importance of ELL Instruction Assessment in Foreign Language
3:10	8 minutes	Vocabulary Strategies --- Fan and Pick
3:18	12 minutes	Three Reads Strategy
3:30	20 minutes	Collaborative Structures --- Showdown --- Sage and Scribe
3:50	10 minutes	Information Gap
4:00	5 minutes	Wrap Up Activities ---- Questions ---- Sharing of Ideas

The Five Dimensions of Powerful Classrooms				
The Content	**Cognitive Demand**	**Equitable Access to Content**	**Agency, Authority and Identity**	**Uses of Assessment**
The extent to which classroom activity structures provide opportunities for students to become knowledgeable, flexible, and resourceful disciplinary thinkers. Discussions are focused and coherent, providing opportunities to learn disciplinary ideas, techniques, and perspectives, make connections, and develop productive disciplinary habits of mind.	*The extent to which students have opportunities to grapple with and make sense of important disciplinary ideas and their use. Students learn best when they are challenged in ways that provide room and support for growth, with task difficulty ranging from moderate to demanding. The level of challenge should be conducive to what has been called "productive struggle."*	*The extent to which classroom activity structures invite and support the active engagement of all of the students in the classroom with the core disciplinary content being addressed by the class. Classrooms in which a small number of students get most of the "air time" are not equitable, no matter how rich the content: all students need to be involved in meaningful ways.*	*The extent to which students are provided opportunities to "walk the walk and talk the talk" – to contribute to conversations about disciplinary ideas, to build on others' ideas and have others build on theirs – in ways that contribute to their development of agency (the willingness to engage), their ownership over the content, and the development of positive identities as thinkers and learners.*	*The extent to which classroom activities elicit student thinking and subsequent interactions respond to those ideas, building on productive beginnings and addressing emerging misunderstanding. Powerful instruction "meets students where they are" and gives them opportunities to deepen their understandings.*

FLASH CARDS—Kagan Structure

Description: The Flashcard Game facilitates mastery of English words, phrases, and rules. Students need flashcards to play. If no flashcards exist for the content, students can easily make their own. The flashcards can take many different forms, depending on the content to be learned. For vocabulary words, one side of the flashcard has a picture and the answer is on the back. For grammar, the card can have future tense on one side and past tense on the other side. Once the cards are made up, students proceed through three rounds in pairs to memorize the content. In Round 1, the "Tutor" shows and reads the front and back of the flashcard. Then, the "Tutor" shows the front of the card and the "Tutee" gives the answer for the back. If the "Tutee" answers correctly, the "Tutor" offers a praise and gives the "Tutee" the card. If the "Tutee" answers incorrectly, he or she does not win the flashcard. The "Tutor" offers a hint or shows the answer again. When they have gone through all the cards, the pair switches roles and goes through the cards again.

For Round 2, fewer cues are given. The "Tutor" shows the front of the card and the "Tutee" tries to win back the card by giving a correct answer. When both students win back all their cards, they move on to Round 3. In Round 3, fewer cues are given yet. The "Tutor" says what's on the front, this time without showing the card. The "Tutee" tries to win back the cards with the correct answer.

The Flashcard Game is done in rounds to improve the likelihood of success at each round. Students are the "Tutor" and "Tutee" and get repeated practice and immediate feedback.

The Three Reads Protocol*

The Three Reads Protocol is one way to do a close read of a complex math word problem or task. This strategy includes reading a math scenario three times with a different goal each time. The first read is to understand the context. The second read is to understand the mathematics. The third read is to elicit inquiry questions based on the scenario.

Why would I use this strategy?

The Three Read Protocol is designed to engage students in sense-making of language-rich math problems or tasks. It deepens student understanding by surfacing linguistic as well as mathematical clues. It focuses attention on the importance of understanding problems rather than rapidly trying to solve them. It allows for the use of authentic, instead of overly simplified, text. This strategy also allows for natural differentiation within a class of diverse learners.

When do I use this strategy?

This strategy can be used for math tasks that include complex language structures or language that lends itself to a variety of interpretations. While this is a particularly useful strategy for English Language Learners, all students can benefit from the deeper understanding of word problem structures and open-ended questioning.

How do I use this strategy?

The Three Reads Protocol uses the "problem stem" of a word problem. This is essentially the word problem without the question at the end. The purpose of presenting the problem stem alone is to have students focus on the contextual and mathematical information before dealing with any question that is involved. This gives students the freedom to create their own questions for a given scenario, which is an excellent skill to develop both in math and in reading in general. It is important that the teacher choose the problem carefully and anticipate potential linguistic and mathematical roadblocks the students may encounter.

1. First Read: Teacher reads the problem stem orally.

The teacher may have visuals to accompany the oral read of the problem stem. Students listen to the story with the goal of turning to a partner and sharing what they remember of it. Memorizing it is not necessary. Students may act out the problem if that helps them grasp the context.

Key Question: What is this situation about?

After the Turn-and-Talk, the teacher asks students to volunteer information they remember from the story. Teachers and students ask clarifying questions about the vocabulary as needed.

2. Second Read: Class does choral read or partner read of the problem stem.

The teacher projects the problem stem so the whole class can see it. The teacher leads the class either in a choral read of the problem or has partners read the problem orally to each other. Choral read is preferable because it allows all students to participate without excessive pressure, but a partner read can work fine if that is a better fit to the classroom culture or age of students. The teacher explains that math stories usually have information about quantities (numbers) and the units that are being counted.

Key Question: What are the quantities in the situation?

An example is 25 cats, where "25" is the quantity and "cat" is the unit. Sometimes the quantities are implied. For example, "some cats" implies a quantity but we do not know what it is. There can also be implied units. An example is "I have one at home." The implied unit in this case depends on the context of the story. Bottom line: The discussion of quantities and units can be important for focusing student attention, but how deeply the teacher delves into the explicit and implicit information depends on the math and language objectives.

3. Third Read: Partner or choral read the problem stem orally one more time.

The teacher asks students to do one more read of the "story" and asks them to think, "What is missing to make this a good math problem?" Students volunteer their answers to that question. Responses will likely vary because many students

assume there is a question without actually reading one. Without correcting student responses, the teacher probes until the class decides that a question is missing. The teacher asks, "Is there only one question that we can ask of this story?" Students' responses may vary, but there are usually many different questions that can be asked of almost any scenario.

Key Question: What mathematical questions can we ask about the situation?

The teacher asks partners to determine at least two questions that can be asked using the problem stem. Students share their questions. The teacher writes a couple of the questions and clarifies language as appropriate. After each question, the teacher asks the class, "Can this question be answered with the information from this story?" and the class discusses why or why not.

4. Students work in collaborative groups on the problem.

Students work in groups to solve a question based on the problem stem. The teacher may assign a specific question for all groups to answer, or groups may choose a question from the list asked by the class. If groups are asked to choose their own questions, it is important that the teacher circulate and clarify expectations for the work. This can be an opportunity to differentiate the math work because the range of possible questions to a problem stem is broad.

* Document courtesy of Chicago Public Schools

THREE READ PROBLEMS

Sasha runs at a constant speed of 3.8 meters per second for $\frac{1}{2}$ hour. Then she walks at a constant rate of 1.5 meters per second for $\frac{1}{2}$ hour.

How far did Sasha run and walk in 60 minutes?

Let a = any rational number. Is the absolute value of a different if a is a positive number or a negative number? Explain.

(Source: envisionmath2.0, 6th grade, 2017)

SAGE and SCRIBE

Step 1

Divide the class into pairs. Designate one student from each pair to be the scribe and the other as the sage, or allow students to choose their first roles.

Step 2

Provide a problem or task to each sage, which he will explain to his scribe. Instruct the sage to describe the task or problem to the scribe so that the sage can reach the correct solution.

Step 3

Allow students to discuss the problem and to ask questions for clarification. Sages cannot help scribes write the solutions, and scribes can only write what sages say.

Step 4

Have the two students in each pair switch positions. Have the scribe become the sage and vice verse for the second task. Repeat the procedure so each student has a chance to fulfill both roles at least once.

Step 5

Repeat the rotation as time allows. Have students turn in papers in pairs, so you can see the both the desired outcome and the actual results.

SHOWDOWN - Kagan Structure

Steps for the Strategy

1. Question cards are stacked in center of the team table.

2. Teacher selects one student on each team to be the Showdown Captain for the first round. Showdown Captain draws the top card and reads the question.

3. Working solo, all students write their answers.

4. When finished, teammates signal they're ready.

5. The Showdown captain calls "show down."

6. Teammates show answers; Showdown Captain leads check.

7. If correct, the team celebrates; if not, teammates reteach then celebrate.

8. The person on left of the Showdown Captain becomes the new Showdown Captain for the next round (repeat from Step 2).

Alternative Use of the Strategy

1. Students could write their own question cards to review for the exam.

2. This is a good strategy to review material that you covered during the last class period that you will be building on during the current course.

Cooperation - Not Competition!

Have you noticed that I don't refer to Showdown as a game? That's because students are cooperating with each other, and there's no competition at all. No one scores points for correct answers and no one is penalized for incorrect answers. Students are not allowed to talk while they are working in Step 3, but after the answer is revealed, they are encouraged to help anyone who had difficulty with the problem.

INFORMATION GAP*

Purpose: Information Gaps are designed to ensure that all students can play an active role in collaborative group activities. These activities support students in reading, speaking, and listening because each student's contribution is essential to the success of the entire group. Information Gaps provide structure for group activities so that teachers can spend more time observing student thinking and discourse. This allows teachers to identify potential strategies or misconceptions that may need to be discussed further.

Description: Information Gap activities are designed for groups of 2 or more students. A task is posed to the group and each individual is provided with a piece or information that is needed for the group to solve to task. Students should not show their information to the rest of the group. Instead, they must read or verbally explain the information they are responsible for. How this Promotes

Access: An activity like this empowers all students to participate in conversations with their peers. Even if students do not understand one of the statements provided, they can work as a group to make sense of the information. Additionally, students are supported in using precise mathematical language in context and for a clear purpose. The small group structure also helps students see how other students are reasoning about the task which supports their flexibility in thinking and their ability to make connections between multiple concepts.

Implementation: Students work in small groups to collaboratively complete a task. Each student receives a piece of information needed to complete the task (often on small cards). Students may not show their information to others. They must read or describe the information for the rest of the group to hear. Students use all of the information shared to come to an agreement on a solution.

* Document courtesy of Chicago Public Schools

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