CAL Webinar
Beyond Numbers: Math and Language in the Home

Webinar
April 3, 2020
CAL Professional Development Team
solutions@cal.org  
@CAL_linguistics  
#languageapplied
http://cal.org/resource-center/freeresources

Participation in Today’s Webinar
- Please keep your audio on MUTE.
- Enter your questions/chat participation in the Questions box.
- We will respond to as many as possible to make them visible to all.

Chat/questions Handouts-PPT

Last Week’s Webinar/Future Posting
http://cal.org/resource-center/freeresources

Ed Policy One-Takes
http://cal.org/resource-center/freeresources

Introductions
- Students have different ways of communicating their feelings, thoughts, and ideas.
- One really positive way of keeping in mind the good with the bad is to identify one’s bright spots of the week.
- Since we last met, name two bright spots for you and your family.

Annie Duguay
My two bright spots are:
1. Face-timing with my Godson in Connecticut. He just brightens my day.
2. I read 4 books that I really enjoyed in a 1 week period of time.

Marybelle Marrero-Colon
My two bright spots are:
1. Face-timing with my nephews in Las Vegas and my daughter in Georgia.
2. Viewing the penguins roaming the halls at the Shedd Aquarium in Chicago.

Maria Cieslak
My two bright spots are:
1. Silly April Fool’s pranks
2. Getting some solo exercise time

Dr. Kate Moran
My two bright spots are:
1. Face-timing with my nephews in Las Vegas and my daughter in Georgia.
2. Viewing the penguins roaming the halls at the Shedd Aquarium in Chicago.
Introductions

- Since we last met, name two bright spots for you and your family.

Chat

Agenda

- Introductions
- Educator Voices
- Language and Math activities
- Brainstorming session

Goals and Objectives

- Content objectives
  - We will brainstorm resources and activities that promote interactive math language.

- Language objectives
  - We will talk and chat about how to promote math skills and language in the home.

EDUCATOR VOICES

Five Ingredients for English Learners in the Era of Coronavirus

Milagros M. Schwartz
ESOL Teacher | Resiliency Coach #239
Benjamin Franklin High School at Masonville Cove
Brooklyn Park, MD 21225

English Learners

- Structure
- Guidance
- Inclusion
- Flexibility
- Patience
Activities To Do at Home

Cooking with Ingredients

Measuring liquids with a Measuring Cup

Storytelling Using L1 & L2

GLOBE Student TL Engagement
Sandra A. Daniel
Language Coordinator
April 3rd, 2020

Features
- Immersive Reader
- Teacher Feedback
- Student responses

Immersive Reader
Helps students read along, languages can be changed for families that do not speak the TL
Feedback

- Ability to record feedback and help students
- Students peer review

Math Language is just as confusing as English

“The language of math has unique language features. So in English a double negative is bad, but in Math it’s a positive?”

Take into consideration...

- College and career readiness standards require educators to consider that math has unique language features.
- Many math teachers have their students do journaling on the math learning and math use experiences.
- Some math teachers make use of cooperative learning – an environment that encourages students to communicate mathematical ideas.
- Most math assessment instruments require that students explain what it is they are doing as they solve the math problems in the assessment.

Taking this into consideration, what does it mean for ELs learning math in the English speaking classroom?

Math Language

- **prepositions**: add to, subtract from, multiply by, divide by, take away from, decrease by, increase by, etc.
- **formula and equation language**: The value of a equals five less than b. $d = r \times t$.
- **steps of a process**: When solving a word problem, first identify all the important information.
- **signal words for addition**: altogether, combined, in excess, sum, greater, in all, both, total, raise, made larger, added to, increased, plus, more, and, etc.
Math Language, cont.

- signal words for multiplication: times, multiply by, multiplicand, multiplier, percent of, interest on, times as much, product, doubled, tripled, etc.
- signal words for division: divide, ratio, fraction, quotient, average, equal pieces, per group, in each group, goes into, contained in, every, shared, etc.

Identify the Language Challenges

- Have you ever noticed that when people eat at a restaurant, they usually leave a little extra money for the server? This extra money is called a service tip, and in the United States, it usually amounts to about 15 to 20 percent of the total bill. The greater the restaurant bill, the greater the tip will be. To calculate the tip, you multiply the amount of the bill by the percentage tip you want to leave. For example, say you go to a restaurant with a friend and the total bill is $20.00. If you want to leave a 15% tip, here is how you can calculate it:
  - Multiply $20.00 by 0.15. This is the amount of the tip. $20.00 \times 0.15 = $3.00
  - Next, add the tip to the price of the bill. This is the total amount you will pay. $20.00 + $3.00 = $23.00
- Therefore, $23.00 is the total price for the meal, including the service tip.

MATH AND LANGUAGE ACTIVITIES

CAL Connections Flipgrid

K-2
https://flipgrid.com/b37f2410

Gr 3-5
https://flipgrid.com/94c19080

Gr 6-8
https://flipgrid.com/7d451517
I know exactly what to do, let me work as quickly as I can.

I don't understand, I'll never get this.

Forget the Math Question

The Obstacle: Sometimes when we put a problem on the board, students notice the question and got into one of two modes:
- I don’t understand, I’ll never get this.
- I know exactly what to do, let me work as quickly as I can.

The Solution: Use “I Notice, I Wonder” Brainstorm, but include only the mathematical scenario. Leave out the question.
- Only after all students understand the scenario thoroughly, reveal the question
- Ask students, “If this story were the beginning of a math problem, what could the math problem be?”

Adapted from NCTM, Beginning to Problem Solve with “I Notice, I Wonder”

Forget the Question

Grades 9-12

You get your SAT score back. Would you rather be in the 93rd percentile or get a 93%?

Option A or Option B

Break

Conclusion
(I would rather _________ than ___________ because __________.)

Grades 9-12

Word Bank
- percentile
- grouped data
- percentage
- score
- results
- data
- quartile
- estimate
- line graph

Grades 9-12

https://www.mathsisfun.com/data/percentiles.html
https://www.varsitytutors.com/hotmath/hotmath_help/topics/percentile

Poll

- How confident are you in accessing and creating digital resources for the instruction English learners?
  - Beginner
  - Intermediate
  - Advanced
  - Proficient
**Beat the Clock Ball Toss**
- One student becomes the Timekeeper. The timekeeper:
  - Sets the timer, turns the card with number concept (e.g., Counting by 2s up to 30, 6 times tables up to 6 x 12, names of geometric shapes (2D and 3 D), and chooses the first participant by tossing the ball.
  - That student thinks of an association with the concept and then tosses the ball to another student who thinks of another.
  - Repeat until the ball has gone around the group 2x or until all answers are given.
  - Stop the timer and as a group summarize what was covered during the game.
  - The last student holding the ball becomes the new timekeeper for the next go-around.

**Multiplication Dominos**
- Dominos are placed face down on the table.
- Students take and turn two dominos over.
- Students then:
  - Add the pips on each domino $8 + 6 = 14$
  - Multiply the pips
- The student with the greatest/lowest (students decide) number wins.
- Variation: Each domino is taken as a fraction and is added, subtracted, multiplied or divided. For example:
  
  $$\frac{3}{5} + \frac{1}{5} = \frac{4}{5}$$

**Math Battleship**
1. Students are given a math worksheet (i.e. simple algebraic equations) to solve. They compare their answers prior to playing the game.
2. Each equation is then given coordinates to a secret location on their game board (i.e. C3, A5, D1, etc.).
3. Students are given a game board with 2 sections. In section 1 they will fill in their secret locations, section 2 is where they record their hits and misses.
4. Students take turns guessing where their opponents answers are. If they are right, it's a “Hit”. If they are wrong, it’s a “Miss”.
5. The first student to “Hit” all of their opponents answers, wins.

**Race to 27**
- Deal out all of the playing cards to the players. Players put their pile of cards in front of themselves face down.
- 1st player turns over their top card and places it in the center.
- The next player turns over their card placing it on top of the first card. This player adds the value of the two cards.
- The next player does the same adding the value of their card to the previous total.
- Play continues until the total reaches 27 or over. The player who puts down the card that takes the total to 27 takes all of the cards in this pile and shuffles them into their pile.
- Play continues for a set time or until one player has no cards left. The winner is the person with the most cards.
- For a more advanced version you can play Race to 50 or Race to 100

**Mnemonics to Recall & Use**

*Hey diddle diddle, the median’s the middle; You add and divide for the mean. The mode is the one that appears the most, and the range is the difference between.*

www.Proven Results.com
Proven Results is an online company for teachers in the 21st century classroom.
Mean, Median, Mode, & Range Game

- In this activity students use plastic cups, blocks, or other object that can be easily stacked.
- They are given a specific amount of time (i.e. 1 minute, 30 seconds, etc.) to build a tower.
- They then record the number of cups, blocks, or other objects used.
- They do rounds where they do the building various times (trials) and copy down the data.
- From the round data, they figure out the mean, median, mode, and range.
- Let’s see what this looks like…

### Mean, Median, Mode, & Range Game

<table>
<thead>
<tr>
<th>Rounds</th>
<th># of Cups</th>
<th>Rounds</th>
<th># of Cups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Round 1</td>
<td>24</td>
<td>Round 2</td>
<td>21</td>
</tr>
<tr>
<td>Round 2</td>
<td>26</td>
<td>Round 3</td>
<td>20</td>
</tr>
<tr>
<td>Round 3</td>
<td>32</td>
<td>Round 4</td>
<td>22</td>
</tr>
<tr>
<td>Totals</td>
<td>82</td>
<td>Totals</td>
<td>62</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Trials</th>
<th>Mean</th>
<th>Median</th>
<th>Mode</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Round 1</td>
<td>26.5</td>
<td>25</td>
<td>24</td>
<td>8</td>
</tr>
<tr>
<td>Round 2</td>
<td>21</td>
<td>21</td>
<td>21</td>
<td>2</td>
</tr>
</tbody>
</table>

**Backward Building (story problems)**

- Purpose: to help learners link language to operations in story problems
- Start with a full visual equation:
- Begin to build in language first by naming the equation orally: eight times three minus nine equals fifteen
- Add objects: Three bowls with eight marbles in each bowl, take away nine marbles

**Teddy Bear Hunt**

- Many communities are doing “teddy bear hunts”—check with your neighborhood Next Door apps or other community groups.
- Ask students to create and analyze data charts depending on their grade levels.
  - Tally marks, data tables, bar graphs, pie charts
Teddy Bear Hunt Data Table

<table>
<thead>
<tr>
<th></th>
<th>Teddy Bears</th>
<th>Stuffed Animals</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outside</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inside</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Sentence stems (depending on age group):
  - There are _____ teddy bears indoors and _____ teddy bears outdoors.
  - Circle one: there are more stuffed animals indoors or outdoors.
  - The total number of stuffed animals is _____.
  - The total number of stuffed animals, including teddy bears, is _____.
  - Circle one: there are fewer stuffed animals, or teddy bears, or _____.

Your Turn

- Which activities would you like to adapt and use from home?
- What math activities or resources have you been engaging in with your students or kids?

Thank You

- View this webinar and download the handouts on our [CAL Online Learning Resource](http://cal.org/resource-center/freeresources) page.
- Join us for our next webinar, Friday, April 17th, 3-4pm EST
  - Kitchen Chemistry and Backyard Biology: Science and Language in the Home
  - [https://attendee.gotowebinar.com/register/3648395491220675085](https://attendee.gotowebinar.com/register/3648395491220675085)

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