



Implementation of ELD Standards in Math Classrooms

Presented by

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www.Corelearn.com

The logo for Core Math, featuring the word "CORE" in red and "MATH" in black, with a small green leaf icon above the "O".

Mental Math

- What is 4×19 ?
- How did you figure it out?

The Ground We Will Cover

- The specific challenges EL students face in math
- Understanding the ELD standards to math
- Gain activities that highlight techniques to assist EL students as well as all learners

English Language Development (ELD) Standards

The CA ELD Standards describe the key knowledge, skills, and abilities that students who are learning English as a new language need in order to access, engage with, and achieve in grade-level academic content.

CA ELD Standards p. 8

ELD Proficiency Levels

- Emerging
- Expanding
- Bridging

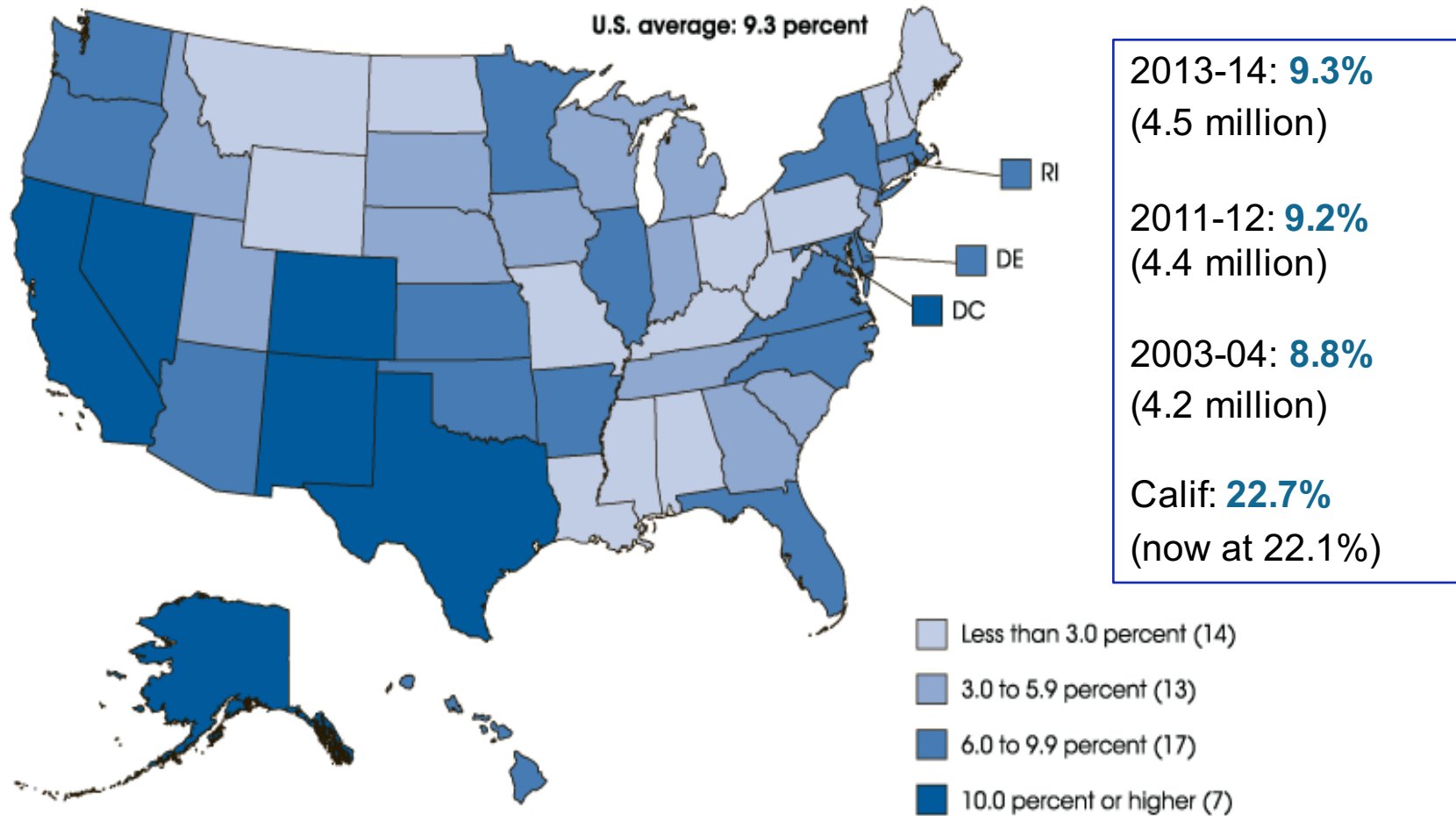
Integrated and Designated ELD

- **Integrated ELD** – Build and support English literacy while learning content. The content is the focus.
- **Designated ELD** – Protected time for EL students with focus on language instruction, utilizing core content material and the CA ELD Standards.

Check this out: YouTube: *Three Minute Thriller on Integrated and Designated ELD*

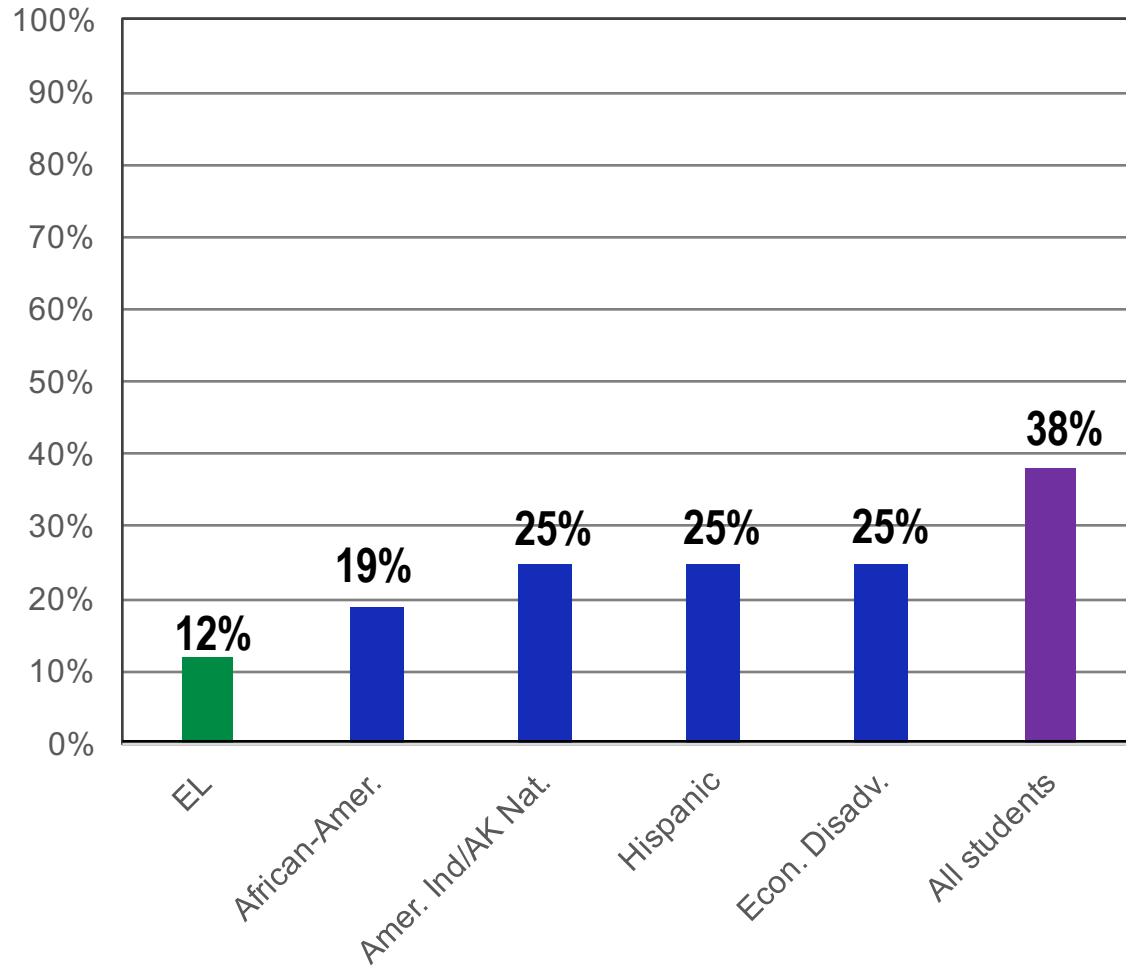
<https://www.youtube.com/watch?v=ozGB4ItMHHE>

EL Student Population Data – USA



From NCES (National Center for Educational Statistics)

CA SBAC 2017 by Subgroups
Percent Proficient or Above



California Department of Education, <http://caaspp.edsource.org/sbac/statewide>

Challenges for ELs to Overcome

- Limited prior and/or background knowledge
- Cultural differences
- Linguistics
- Polysemous words
- Syntactic features of word problems
- Semantic features

—California Math Framework, Universal Access, 2015

Challenging Semantic Features

- Long dense noun phrases
 - *The volume of a rectangular prism with sides 8, 10, and 12 cm*
- Classifying adjectives that precede the noun
 - ***Prime number, rectangular prism***
- Qualifiers that come after the noun
 - *A number **which can be divided by one and itself***
- Conjunctions:
 - *If, when, therefore, given, assume*

—Schleppegrell, 2007

Challenges with Math Vocabulary

<p>Double Meanings:</p> <table> <tr> <td>table</td> <td>fraction</td> <td>even</td> </tr> <tr> <td>base</td> <td>rational</td> <td>tangent</td> </tr> <tr> <td>side</td> <td>irrational</td> <td>variable</td> </tr> <tr> <td>point</td> <td>operation</td> <td>volume</td> </tr> <tr> <td>mean</td> <td>expression</td> <td>etc.</td> </tr> </table>	table	fraction	even	base	rational	tangent	side	irrational	variable	point	operation	volume	mean	expression	etc.	<p>Homophones:</p> <table> <tr> <td>cent</td> <td>→</td> <td>sent or scent</td> </tr> <tr> <td>plane</td> <td>→</td> <td>plain</td> </tr> <tr> <td>two</td> <td>→</td> <td>to or too</td> </tr> <tr> <td>sum</td> <td>→</td> <td>some</td> </tr> <tr> <td>sine</td> <td>→</td> <td>sign</td> </tr> </table>	cent	→	sent or scent	plane	→	plain	two	→	to or too	sum	→	some	sine	→	sign
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<p>Unique Terms:</p> <p>hypotenuse, parallelogram, coefficient, quadratic</p>	<p>Similar Sounding Words:</p> <table> <tr> <td>tens vs. tenths</td> <td>then vs. than</td> </tr> <tr> <td>sixty vs. sixteen</td> <td></td> </tr> </table>	tens vs. tenths	then vs. than	sixty vs. sixteen																											
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Density of Text

Mathematics is the most difficult content area material to read because there are more concepts per word, per sentence, and per paragraph than in any other subject; the mixture of words, numerals, letters, symbols, and graphics requires the reader to shift from one type of vocabulary to another.

—Braselton & Decker, 1994

Integrating the CA ELD Standards into K–12 Mathematics and Science Teaching and Learning (CA ELD in Math document)

<http://www.cde.ca.gov/sp/el/er/eldstandards.asp>

Developed by WestEd

Highlight ways in which the CA ELD Standards, when used in combination with the CA CCSSM and/or the CA NGSS, can be applied to mathematics and science language and content learning. (p. 14)

CA ELD in Math document - Description

- Describes how each of 19 ELD standards can be addressed in math.
 - Specific examples within each of four grade bands (K-2, 3-5, 6-8, and 9-12).
 - Color coded tables for each grade band

CA ELD in Math document - Techniques

- Discourse
- Visual Aids
- Grouping Strategies
- Organizing Lessons
- EL Specific Strategies

CA ELD in Math document - Explore

- See grades 3-5, Part II, B, 5
- Review samples from CA ELD Math document
- Check-off techniques illustrated in the sample(s) you review.
 - Use column A to check-off techniques on the ***Common Techniques*** chart

Let's Try Division

6-8: Examine the four division problems shown below.

Without calculating the quotients, which quotient is closest to 1? Explain and/or show your reasoning.

A.

$$\frac{19}{20} \div \frac{1}{18}$$

B.

$$\frac{1}{20} \div \frac{1}{18}$$


C.

$$\frac{1}{4} \div 4$$

D.

$$4 \div \frac{1}{4}$$

CORE Word Knowledge Chart (Frayer type)

Word	
<i>Fraction</i>	
Meaning (in own words) <i>Part of a whole.</i> <i>Write it as one number over the other number.</i> <i>One number divided by another number.</i>	Visualization or Drawing $\frac{2}{5}$ 
Examples $\frac{2}{5}$ $\frac{7}{4}$	Other Characteristics or related words <i>Numerator</i> <i>Denominator</i> <i>Improper fraction</i>

Sorting & Matching Activities

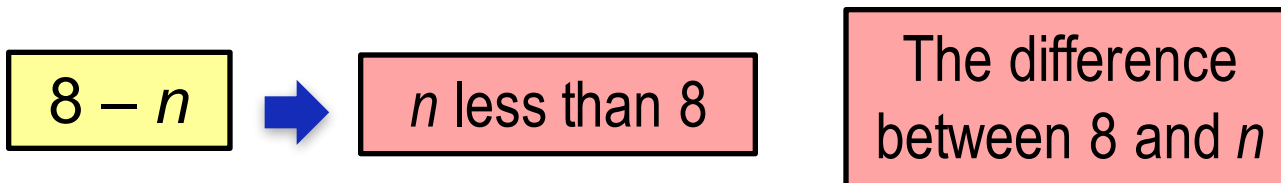
- Sort cards or objects into groups based on common properties or characteristics.
- Students identify the rationale for how cards/concepts are sorted or matched.
- Each student keeps his/her own record.

Symbol and Cue Card Matching

Match Symbol cards with Cue cards (salmon)

- In groups of 2-4, use envelopes provide.
- One person is the “judge” to check the answers.
- Other people take turns matching a Cue card to a Symbol until all Cue cards are used up.
- Record correct answers. **Put back if incorrect.**

NOTE: More than one correct match usually possible.



Best Deal

One store is having a 50% off sale. Another store has a 40% discount, with an additional 15% off of the sale price. Which sale should you take advantage of if you want the best reduction on a sweater that costs \$68.79?

- **Individually:** Guess which is the better deal. Record.
- **Pair-share:** Share guess and reasoning.
- **Individually:** Solve the problem. Show your work.
- **Pair-share:**
 - Explain what you would have to pay in each sale.
 - Compare similarities/differences between the two sales.
 - Share your solution and justification.

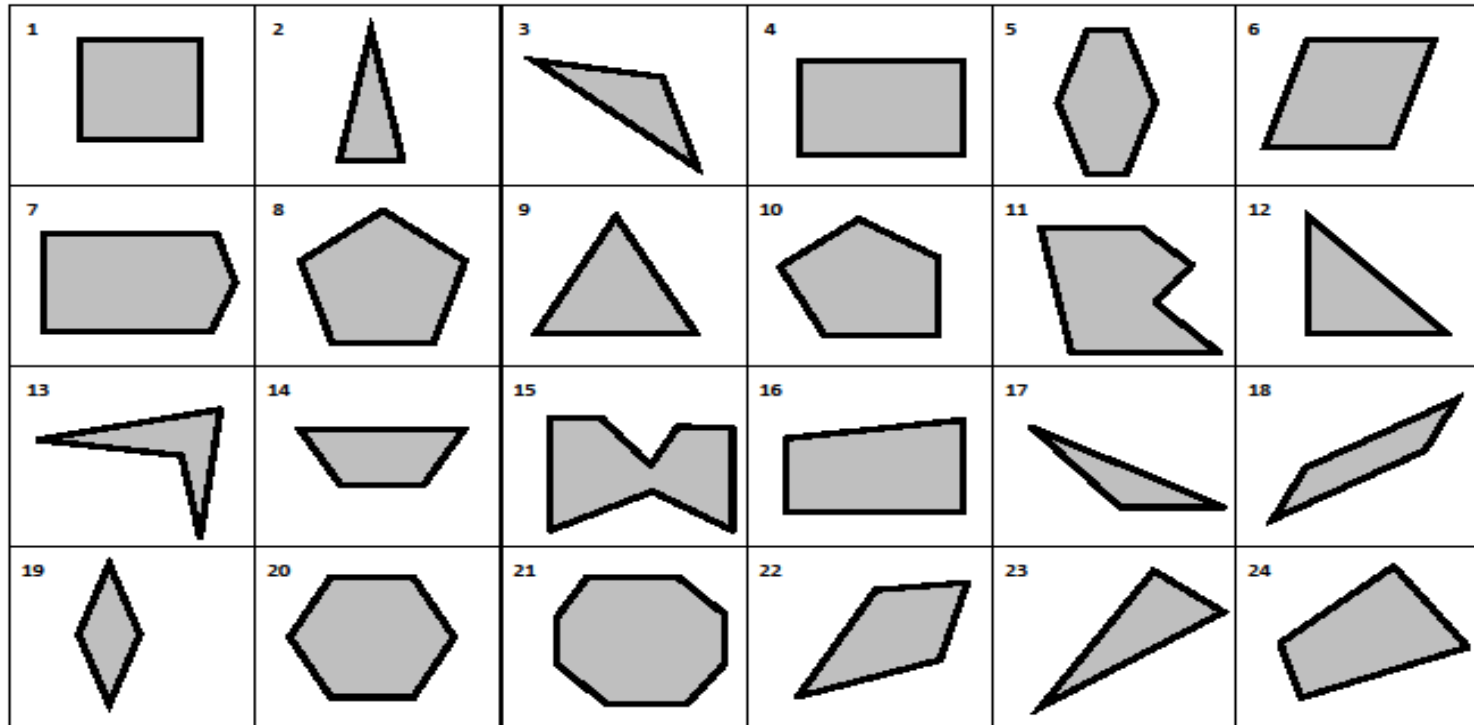
Turn and Talk with Sentence Frame

- I think the 50% discount is _____ than the 40% plus an added 15% discount off of the sale price because _____.
- Turn to a partner and share your statement.

Sentence Stems and Frames

- Specific sentence frames:
 - A. The store with the best reduction is _____ because _____.
 - B. The sales at the two stores are similar because they both _____.
 - C. The sales at the two stores are different because _____.
 - D. Comparing the sales at the two stores is tricky because _____.

Guess My Polygon Activity



Questions

- Yes/No questions only
- Must be related to shape characteristics

Modify Lesson as Needed

- Choose either the 1st grade Lesson 3 or the 6th grade Lesson 5. (EngageNY/Eureka Math)
- Read and modify a lesson to highlight and/or plan in scaffolds to support EL students.

Wrap Up - What techniques were used to address language challenges?

- On your chart of Techniques, identify those you have seen or discussed today.

Let's Connect!

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Consortium on Reaching Excellence in Education



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CORE provides site-based job-embedded professional learning services for K-12 math and ELA.

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