



Think of a number  
between  
0 and 20.  
Add 32 to it.  
Multiply by 2.  
Subtract 1.  
Now close  
your eyes.  
It's dark Isn't it



# EL Tool Kit Chapter 4 (ELs and CCRS – Math)

Regular and active participation in the classroom – not only reading and listening but also discussing, explaining, writing, representing, and presenting – is critical to the success of ELs in mathematics

- X ELs should understand the text of word problems before they attempt to solve them [Ex.: Utilizing a consistent method for approaching and solving](#)
- X There should be a focus on “mathematical discourse” and “academic language” [Ex.: Participating in a Mathematical Discourse Community](#)
- X Vocabulary instruction, alone, is not sufficient for supporting mathematical communication [Ex.: Visual Vocabulary for Math is best practice](#)

# ESEA as amended by Every Student Succeeds Act (ESSA) 2015

- High academic standards for all students
- ELs language proficiency and academic achievement are more fully integrated into accountability and assessment



# Basic Interpersonal Communication Skills (BICS) Social Language 1-2 years

(Cummins, 1979)



- Playground language
- Conversations with family, friends and neighbors
- Greetings that you exchange with others on the street or in the elevator

# Cognitive Academic Language Proficiency (CALP)

## Academic Language

### 5-7 Years

(Cummins, 1979)

Language necessary  
for academic success

- Listening
- Speaking
- Reading
- Writing



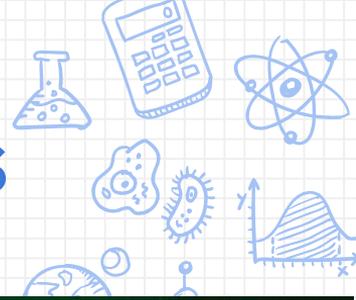
# The Myth of Math

In the past, Math has been viewed as less linguistically challenging.

Today, there is a new focus on the language demands of Math for ALL students, particularly English Learners, as teachers realize proficiency is not only related to numeric computation, but demonstrating the ability to “speak math.”

Cummins-Early 2015

# Mathematics Discourse Communities

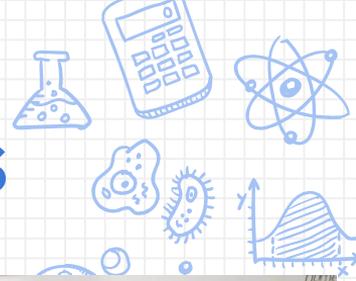


## What Teachers DO:

- Engage Students in purposeful sharing
- Select and Sequence student approaches and solutions strategies
- Facilitate discourse among
- Ensure progress toward mathematical goals



# Mathematics Discourse Communities



## What Students DO:

- Present and explain ideas, reasoning, and representations
- Participate in active listening to respond to the reasoning of peers
- Seek to understand the approaches used by peers
- Identify how different approaches to solving a task are similar or different



## Multiplication Word Problems

### CCRS Standards

- [4-OA2] Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.
- [5-OA2] Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.
- [6-NS3] Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
- [7-NS3] Solve real-world and mathematical problems involving the four operations with rational numbers.

### WIDA Standard

- ELD **Standard 1** – English language learners communicate **for Social and Instructional purposes** within the school setting.
- ELD **Standard 2** - English language learners communicate information, ideas and concepts necessary for academic success in the content area of **Language Arts**.
- ELD **Standard 3** - English language learners communicate information, ideas and concepts necessary for academic success in the content area of Mathematics.

# COINS

Word Problem Strategy

- C** - Comprehend the question (What is it asking?)
- O** - Observe the data (Underline the given information and #s)
- I** - Illustrate (Draw a picture)
- N** - Number (Write a number sentence)
- S** - Solve (Solve the equation)

# RISE

**R**eread Circle important words + #s

**I**llustrate draw a picture

**S**olve Write a # sentence

**E**xplain explain your thinking

# CUBES

A problem solving strategy

**C** - circle the #s

**U** - underline the ques.

**B** - box the words that are keywords

**E** - eliminate info not needed

**S** - Solve by showing your work

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Read the question carefully



Make sure you understand the question

Remember to use



Read Understand Choose Solve Answer Check

when calculating mathematical problems

# What is a Language Objective?

## Content Objective/Learning Target

- Students will **identify** the key parts of a word problem to **develop** an equation and **solve** using multiplication, **documenting** their reasoning in a **double entry journal**.

## Language Objective/Target

- Students use oral language to **discuss** key information in the word problem in **small groups** using a **graphic organizer, sentence/paragraph frames, anchor charts, and visual vocabulary**.
- Students **note** and **explain** their reasoning in **small groups** using a **graphic organizer, sentence/paragraph frames, anchor charts, and visual vocabulary**.

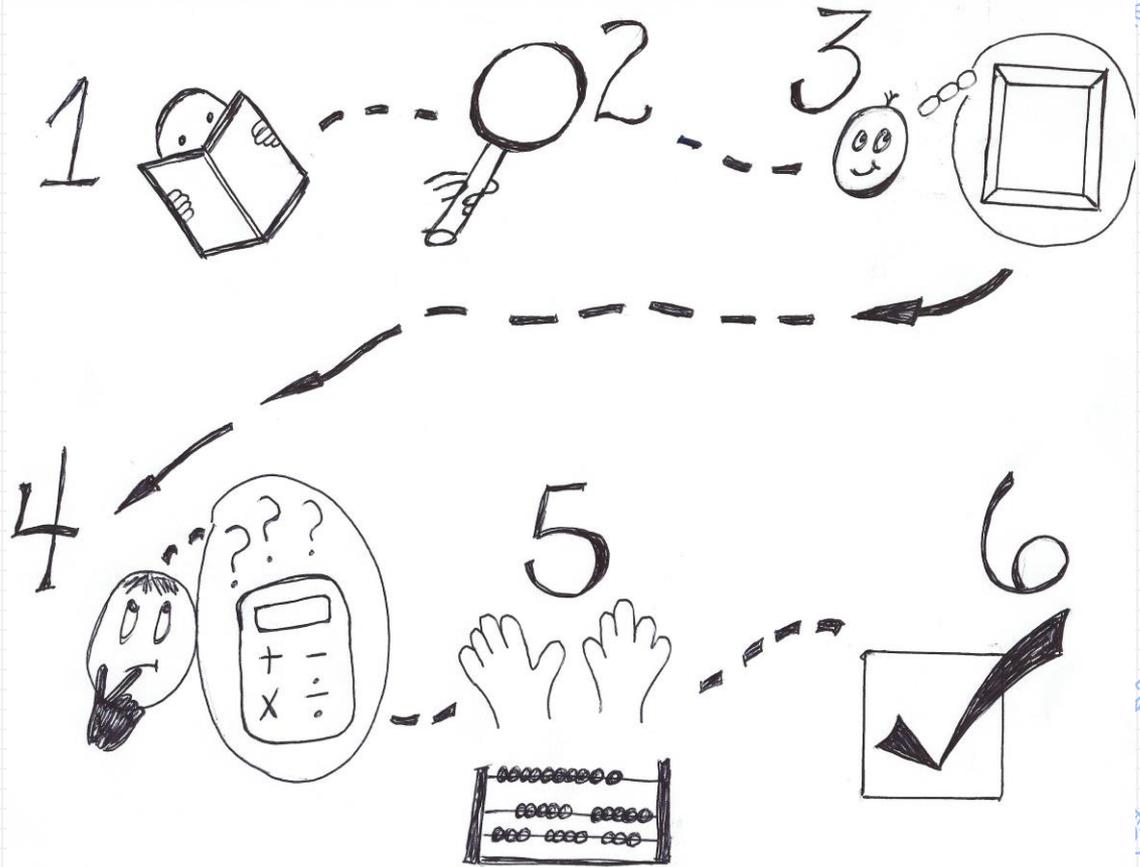
**NO SCAFFOLDING**



**NO WORRIES**

# Graphic Organizers

1 Reading the question	2 Finding and marking the clue words
3 Getting a picture of the problem in my head	4 Thinking, what calculations do I need to do?
5 Estimating and Calculating	6 Checking, is the answer sensible?







선셋 초등학교의 학생수가  
1548명입니다. 교장 선생님이  
학기 시작 전에 학생당 다섯  
자루의 연필을 주려합니다. 교장  
선생님은 모든 학생을 위해  
몇자루의 연필을 사야될까요?

# Visual Vocabulary

Pictures and Words-Words and Pictures!

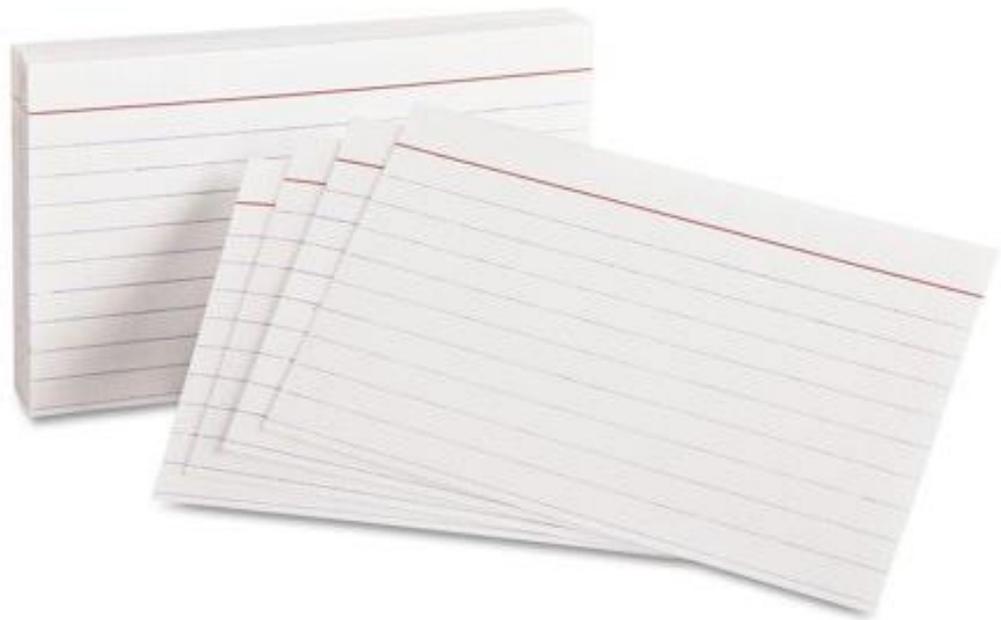
## Visual Vocabulary Korean



# How to GOOGLE Great Pictures:

- Go to Google and type the word in the search box.
- Click on “Images”
- Click on “Tools”
- Click on “Size” and designate “Large” –this will give you the pixel density you need to produce pictures the students can see well-and the pictures will look great in PPT!
- Choose your pic and **PRINT in color!!!!**

# Vocabulary Cards



## Level 1

Students demonstrate solving word problems using multiplication strategies by reading the problem in L1 and/or using pictures, drawings and selected words in L2, in a small group, documenting mathematics strategies.

Supports:  
Visual Vocabulary,  
Vocabulary Cards,  
Graphic Organizer  
All Levels: Anchor  
Charts and Double  
Entry Journal

## Level 2

Supports:

## Level 3

Supports:

## Level 4

Supports:

# Sentence Frames



There are 1548

students

in the

school

**Level 1**

Students demonstrate solving word problems using multiplication strategies by reading the problem in L1 and/or using pictures, drawings and selected words in L2, in a small group, documenting mathematical reasoning.

Supports:  
Visual Vocabulary,  
Vocabulary Cards,  
Graphic Organizer  
All Levels: Anchor Charts and Double Entry Journal

**Level 2**

Students demonstrate solving word problems using multiplication strategies by reading the problem in L1 and/ or using pictures, simple phrases/sentences in L2, in small group, documenting mathematical reasoning.

Supports:  
Visual Vocabulary,  
Vocabulary Cards,  
Graphic Organizer,  
Sentence Frames  
All Levels: Anchor Charts and Double Entry Journal

**Level 3**

Supports:

**Level 4**

Supports:

# Paragraph Frames



There are 1548

students

in the



school.



The

principal

needs 5



pencils

for each



student.



How many

pencils

will the

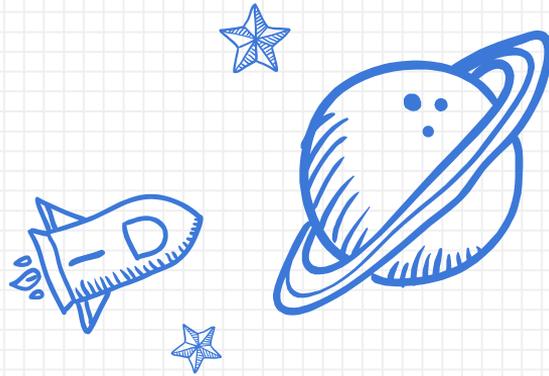


principal

buy?

Level 1	Level 2	Level 3	Level 4
<p>Students demonstrate solving word problems using multiplication strategies by reading the problem in L1 and/or using pictures, drawings and selected words in L2, in a small group, documenting mathematical reasoning.</p>	<p>Students demonstrate solving word problems using multiplication strategies by reading the problem in L1 and/ or using pictures, simple phrases/sentences in L2, in small group, documenting mathematical reasoning.</p>	<p>Students demonstrate solving word problems using multiplication strategies by reading the word problem including key technical vocabulary in simple paragraphs, in small groups, documenting their mathematical thinking.</p>	
<p>Supports: Visual Vocabulary, Vocabulary Cards All Levels: Graphic Organizer, Anchor Charts, and Double Entry Journal</p>	<p>Supports: Visual Vocabulary, Vocabulary Cards, Sentence Frames All Levels: Graphic Organizer, Anchor Charts and Double Entry Journal</p>	<p>Supports: Visual Vocabulary, Vocabulary Cards, Paragraph Frame All Levels: Graphic Organizer, Anchor Charts and Double Entry Journal</p>	<p>Supports:</p>

Level 1	Level 2	Level 3	Level 4
<p>Students demonstrate solving word problems using multiplication strategies by reading the problem in L1 and/or using pictures, drawings and selected words in L2, in a small group, documenting mathematical reasoning.</p>	<p>Students demonstrate solving word problems using multiplication strategies by reading the problem in L1 and/ or using pictures, simple phrases/sentences in L2, in small group, documenting mathematical reasoning.</p>	<p>Students demonstrate solving word problems using multiplication strategies by reading the word problem including key technical vocabulary in simple paragraphs, in small groups, documenting their mathematical thinking.</p>	<p>Students demonstrate solving word problems using multiplication strategies by reading the word problem including key technical vocabulary in expanded sentence form, in small groups, documenting their mathematical thinking.</p>
<p>Supports: Visual Vocabulary, Vocabulary Cards All Levels: Graphic Organizer, Anchor Charts, and Double Entry Journal</p>	<p>Supports: Visual Vocabulary, Vocabulary Cards, Sentence Frames All Levels: Graphic Organizer, Anchor Charts and Double Entry Journal</p>	<p>Supports: Visual Vocabulary, Vocabulary Cards, Paragraph Frame All Levels: Graphic Organizer, Anchor Charts and Double Entry Journal</p>	<p>Supports: Visual Vocabulary, Vocabulary Cards, All Levels: Graphic Organizer, Anchor Charts and Double Entry Journal</p>



# It's YOUR turn

Please listen and follow instructions!



Home work is only helpful when there is someone at home to help!!!

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