

Rigorous and Relevant Literacy

PART I



**International Center for
Leadership in Education**


**With Lin Kuzmich
Senior Consultant, ICLE
Port Huron School District
September 2011**

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International Center for Leadership in Education

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International Center for Leadership in Education

21st Century Literacy and Learning Part I

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Welcome!

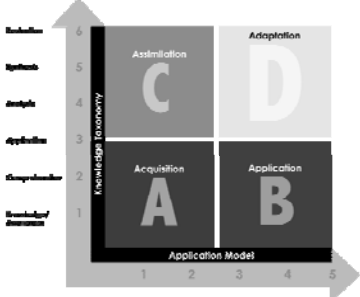
- ▶ Suffering is Optional
- ▶ Participation is Most Appreciated
- ▶ Electronics on vibrate
- ▶ Getting Your Questions Answered
- ▶ Participation Appreciated
- ▶ Computer use for note taking is fine, however please check your email only during breaks or lunch
- ▶ Listen with the Intent to Understand



Kuzmich, 2011

Rigor/Relevance Framework®

All Learning Starts with Great Relationships



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Kuzmich, 2011

Assess the Needs of Today's Students. What actions do you need to take as a result?

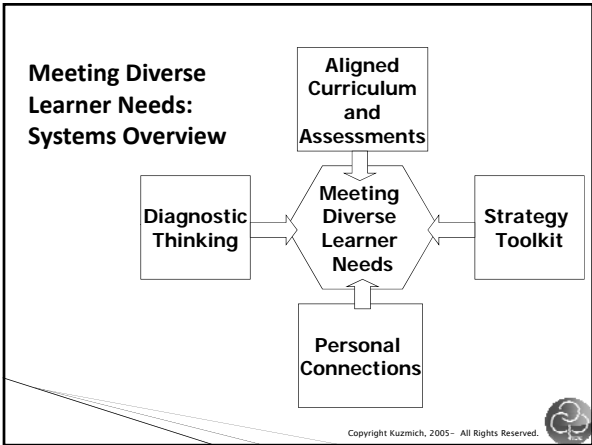
How are they different?

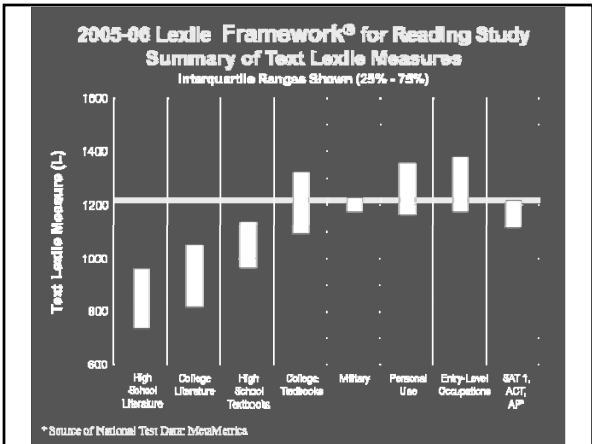
What do you need to provide these students to succeed?

Agenda

- I. Introduction
- II. Learning and the Brain: Teaching Thinking Takes a Few Key Moves Each Day
- III. Vocabulary is the Gateway to Rigorous Content Based Thinking and Performance
- IV. Next Steps

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Increased Text Complexity Grade Bands and Associated Lexile Ranges

Text Complexity Grade Band in the Standards	Old Lexile Ranges	Lexile Ranges Aligned to College and Career Expectations
K-1	N/A	N/A
2-3	450-725	450-790
4-5	645-845	770-980
6-8	860-1010	955-1155
9-10	960-1115	1080-1305
11-College and Career Readiness	1070-1220	1215-1355

Earning Potential as it Relates to Lexile Levels

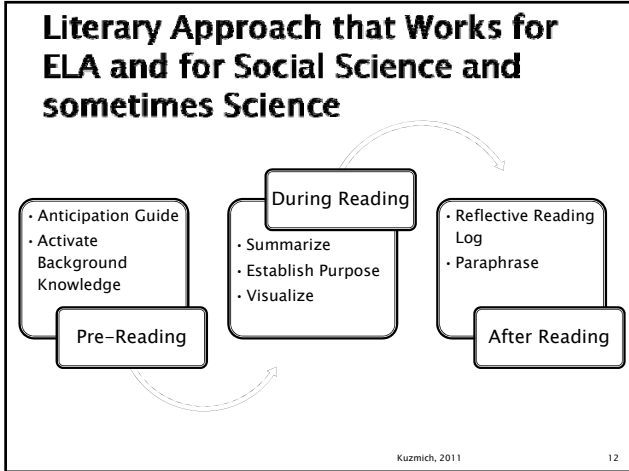
- › Between 1000 and 1300L, each additional 150 of reading ability **doubles** the income expectations of the worker.
- › Proficiency should not be based upon perceptions of what children can or cannot do, but upon the reading and communication proficiencies demanded by the workplace.
- › Students below a Lexile Level of 1000 will not succeed in the workplace let alone be college or technical school ready.

10

Challenges to Reading and Information Gathering in the Content Areas That Must be Addressed for Success on the CCSS

- › **Concept Density** - more ideas and skills in less time
- › **Specialized Vocabulary** - unique and multiple meanings
- › **Readability** - higher than student skill levels
- › **Length** - longer and more comprehensive
- › **Graphs/Charts/Maps** - complex information
- › **Non-Print Sources** - online information

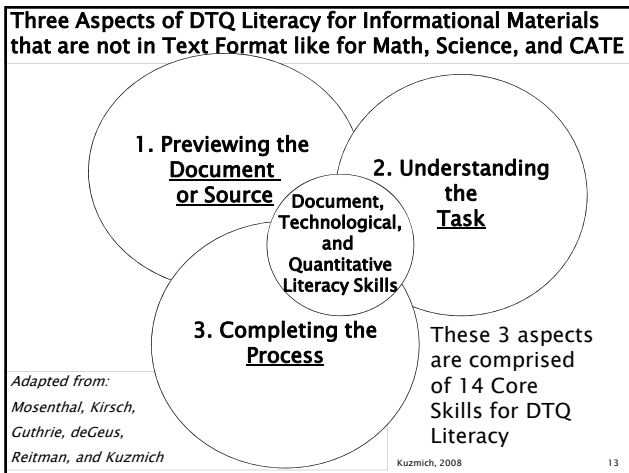
11



High Payoff Literacy Strategies are in these Categories: The Big 8

1. Vocabulary
2. Student Dialogue and Grouping
3. Write to Learn
4. Graphic Organizers and Note Takers
5. Teacher and Student Questioning
6. Document, Technological, and Quantitative Literacy Strategies
7. Leveled Materials and Digital, Multi-Media Resources
8. Text and Media Complexity Access

Kuzmich, 2005, rev. 2011 All Rights Reserved.



What happens when you focus on the literacy of your content?

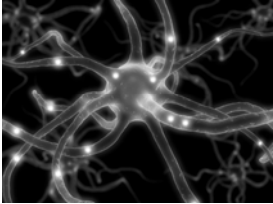
- ▶ Results increase for even struggling students
- ▶ You re-teach less often
- ▶ Students retain more
- ▶ Critical thinking is easier to scaffold in your content area

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II. Learning and the Brain

What is learning?

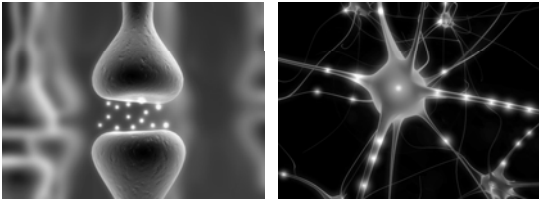
How can we use this knowledge to improve critical thinking and literacy for diverse learners?



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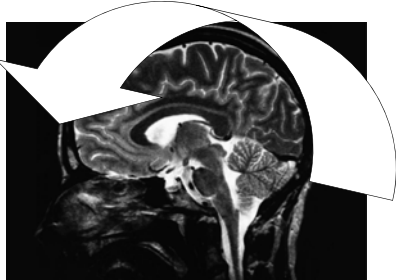
Learning Is...

New Connections New Dendrites



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New Learning that Moves to the Frontal Cortex Increases Memory and Critical Thinking in Any Content Area



21

Path of Initial Learning

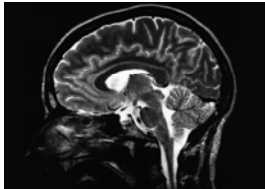
Path of Initial learning that results in short and long term memory	Notes on teaching and learning implications
We take everything in through our senses.	
We have a survival and emotional response.	
We associate what we are hearing, seeing, or experiencing.	
We make new connections and are able to think in a more complex way about what we are learning.	

III. Vocabulary is the Gateway to Rigorous Content Based Thinking and Performance

- A. Brain Essentials for Vocabulary**
- B. What Not to Do for Vocabulary Instruction**
- C. Brain and Content based Key Vocabulary Strategies**



A. Brain Essentials

- ▶ Use More of the Brain
- ▶ Making Meaning
- ▶ Attributes of Great Instruction
- ▶ The Duality Principle
- ▶ The CNN Effect



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The Big 8: High Payoff Rapid Results Focus Areas for Your Literacy and Your Learning Toolkit

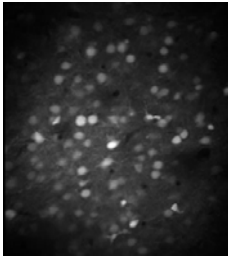


1. Vocabulary
2. Student Dialogue and Grouping
3. Write to Learn
4. Graphic Organizers and Note Takers
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6. Document, Technological, and Quantitative Literacy Strategies
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8. Text and Media Complexity Access

25

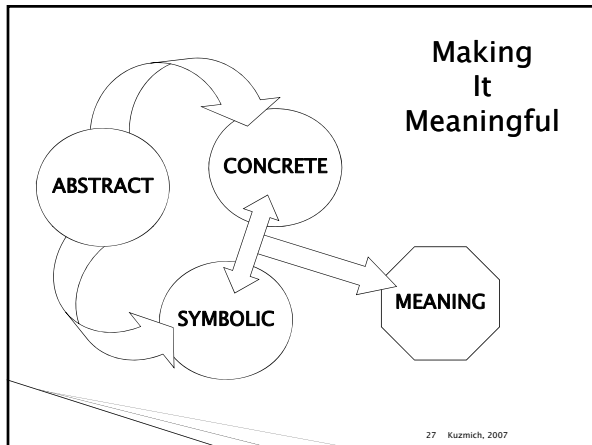
Activating Learning and Memory with Relevance and Purpose

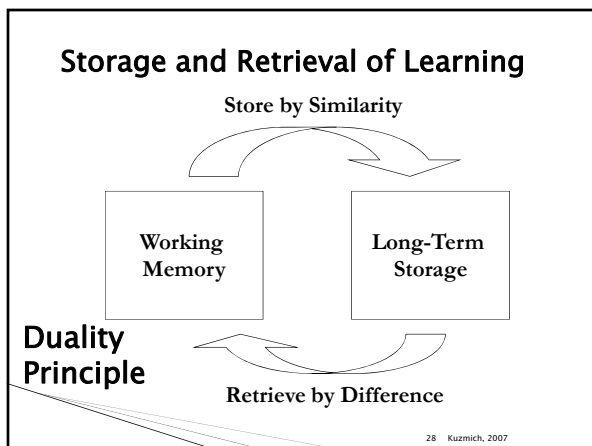
- ▶ Learning takes place when multiple neurons fire from numerous places in the brain, and these new memories can be retrieved over a period of time.
- ▶ Learning must be connected and relevant to be remembered.
- ▶ We only remember things that have meaning for us.



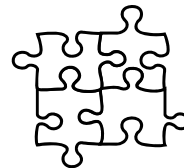
The Brain Responding to Visual Stimuli
Image courtesy of R. Clay Reid

26





Protocol for Making Vocabulary and Concept Development Sticky and Memorable Especially with Tough Content or Struggling Learners



- 1. First Teach and have Students Experience:**
 - A. Category, pictures, models, and examples (real world where possible)
 - B. Similar and dissimilar concepts
 - C. Attributes, characteristics, functions
- 2. Then create definition of a concept already attained (where possible in your own words)**
- 3. Finally, create one of these:**
 - A. A sentence using the vocabulary
 - B. An explanation or justification of relevance

OR

 - C. An example that requires use of the word(s).

Adapted by Lin Kuzmich (2011) originally from Marzano and Arrendondao (1986) based on the work of L. King, R. King, B. Bledsoe, J. Owens, E. Brooks and legions of psycholinguists since the 1950's.

B. What Not to Do with Vocabulary Instruction

- › Many Studies
- › Age specific strategies matter
- › Content specific strategies matter
- › Avoid the usual with this generation, the new highly visual, media drenched students learn differently, especially those at risk
- › What worked for you because does not mean it will work for students today

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Vocabulary is the Gateway to Thinking

Most of us learned to teach vocabulary by having students:

- Write the word several times
- Find the definition
- Write it in a sentence

Meta-research from William Nagy, Teaching Vocabulary to Improve Comprehension, ERIC, 2000 reports that...

These are the three least effective methods of initially teaching vocabulary and cause regression in assessment results!

31



C. Additional Vocabulary Strategies

- › Content examples
- › Promotes memory
- › Promotes Rigorous thinking about content
- › Supports the brain's need for analysis with words
- › 7 High payoff strategies
 1. Verbal Rehearsal
 2. Visual Clueing or Imprinting
 3. Analogies
 4. Combining Clues-Games
 5. Graphic Organizers for Vocabulary
 6. Carding Strategies
 7. Latin and Greek Origins or Word Families

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1. Verbal Rehearsal

- ▶ Connect with prior learning.
- ▶ Association method (what does this remind you of or how does this compare to...?)
- ▶ Think-Pair-Share
- ▶ Require accurate use of content vocabulary in presentations and class discussions.



33 Kuzmich, 2005

Content Area Modifications

Math and Science	ELA and Social Studies
<ul style="list-style-type: none"> ▶ Use verbal rehearsal to practice content words in describing process, rules or patterns, procedures, strategies, data analysis, error analysis ▶ In science, the verbal formulation of hypothesis is helpful using correct content language and in the above conditions for math 	<ul style="list-style-type: none"> ▶ Use verbal rehearsal to practice content language to reflect on purpose, intent of author, character, or in light the times or era, place or events notes patterns of behavior, or influences ▶ Use verbal rehearsal to use content words to describe life lessons and the impact of actions or conditions

34 Kuzmich, 2009

2. Visual Clueing or Imprinting

- ▶ Key words in your classroom associate with a picture or visual example to tie the visual with the linguistic
- ▶ Color code or place with pictures, clip art, in presentations or on student work
- ▶ Can use words with appropriate symbols if a single picture or visual example will not work.
- ▶ Write/draw on homework or assignments
- ▶ Also called, "Environmental Imprinting"
- ▶ Create visual associations especially with the most important words of a unit or lesson

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Content Specifics for Visual Clueing

Math and Science

Math – use with examples, relevance of the math or context in the real world, use symbols for root words, prefixes or suffixes

Science – use with exact pictures of noun based words or complex pictures of processes, use symbols with root words, prefixes or suffixes

Greek and Latin word parts

ELA and Social Studies

▶ ELA – use pictorial metaphors, similes, and analogies with literary terms, use more exact pictures with setting, use symbols or metaphorical pictures with character or characterization

▶ Social Studies – use more complex pictures that represent several words as with "isms", use symbols with roots or realistic symbols with geographic, real pictures of nouns, complex with verbs or eras

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36

Word Walls and the Secondary Level

- ▶ Not all words are equal, so teach the underlying concepts through bold print, color, webs.
- ▶ Use feature analysis.
- ▶ Establish parts to whole relationships.
- ▶ Create an array with concepts in different degrees. Organization in a web, tree map, flow chart, or other relational array works best.



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37

Environmental Imprinting

- ▶ Word Walls
 - Follow the Secondary rules, not the elementary rules, for sight words
- ▶ Visual Cueing
 - Support Current Unit
 - Use of student work with highlight vocabulary
 - Posted Student Work
- ▶ Technology Use
 - Interactive activities with students
 - Web 2.0 Tools



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38

Myths and Truths: Word Walls at the Secondary Level

Myths

- ▶ Random placement of words up in the classroom increases memory
- ▶ Alphabetic placement increases word usage in class assignments
- ▶ Word walls work only in classes with numerous ELL and SPED students
- ▶ Teachers are responsible for word walls

Truths

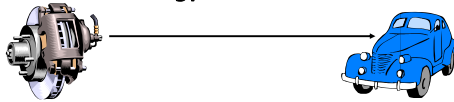
- ▶ Words on walls should always be categorized
- ▶ Connections between words should be shown with lines, arrows, or choice of array
- ▶ At least the category title should be illustrated
- ▶ Color coding works
- ▶ Word walls specific to the current unit increase memory when properly organized
- ▶ Students should interact or even help create word walls
- ▶ Personal word walls can be created by the student

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39

3. Analogies

- ▶ Connect to prior knowledge
- ▶ Use opposites or parts
- ▶ Use as prompt, questions for discussion
- ▶ Use verbal, visual, or written analogies
- ▶ Analogies are one of the pre-requisites for inference
- ▶ See Marzano, Pickering and Pollack: Metaphors and Similes (45% gain) are forms of analogy



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Analogy Reasoning

What is it?

Identifying how one set of concepts has similar relationships to those found in another set of concepts

Process:

1. Identify relationships between the two elements in the first set.
2. Identify which element in the first set is most closely related to the single element in the second set.
3. Identify an element that would make the second set of elements have the same relationship as the first set.
(Marzano and Arrendando, 1986)

46

Nine Analogical Relationships

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Synonyms or similar relationships (pretty-cute) 2. Antonyms or dissimilar relationships (hot-cold) 3. Concepts within the same class (independent variables and dependent variables) 4. Category name and member (cells-plant cells) whole to part 5. One concept turns into another (tadpole-frog) | <ol style="list-style-type: none"> 6. One concept performs a function on another (territory dispute-war) 7. Time or sequence relationship (morning-noon) 8. Quantity, size, or physical dimension relationship (tall-Empire State Building) 9. Part to whole (hero is to fantasy or x-axis is to coordinate plane) |
|--|--|

Why are these important?
Which ones are most?
What are some examples in your content area?

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Specific Sentence Stems Often Work Best for Comparisons

When comparing two shapes...

Partner A: Ask your partner to make comparisons.

1. How are _____ and _____ alike?
2. What other similarities do _____ and _____ have?
3. What is the most significant similarity between _____ and _____?
4. Is there anything else that makes _____ and _____ similar?

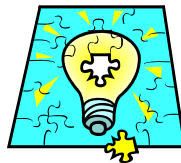
Specific Sentence Stems Often Work Best For Comparisons

Partner B: Answer your partner's questions, using the sentence stems below.

1. Both _____ and _____ are alike because _____.
2. Like _____, _____ has _____.
3. The most significant similarity between _____ and _____ is _____.
4. _____ and _____ are/have _____.

4. Combining Clues to Utilize the Definition - Games

- ▶ Give clues leading to a definition.
- ▶ Develop characteristics or map patterns.
- ▶ Develop relationships to prior knowledge - web the features before the center of the web.
- ▶ Have students guess the word with clues and give a use.
- ▶ Also known as "constructivist vocabulary development"
- ▶ Use games such as Jeopardy, Wheel of Fortune, 20 Questions, Who Wants to be a Millionaire, etc.



Kuzmich, 2005

50

Content Modifications

<p>Math and Science</p> <ul style="list-style-type: none"> ▶ Math – Use print examples as well as verbal for the clues since math is so symbolic, use as a review strategy ▶ Science – Use motions, visuals as well as verbal since science is such a visual subject, use as a review strategy 	<p>ELA and Social Studies</p> <ul style="list-style-type: none"> ▶ ELA – use pieces of text, stanzas, quotes to help with clues as well as a charades type approach ▶ Social Studies – use visuals, film clips, quotes, maps as well as verbal clues since social studies is a mix of learning styles in the brain
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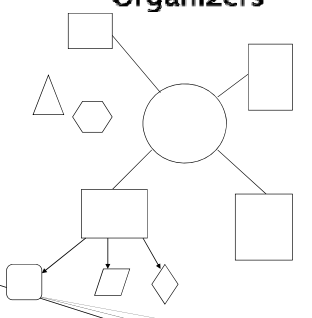
Kuzmich, 2009 51

5. Graphic Organizers: Magic Six to Start

- ▶ Highly researched for use with vocabulary instruction
- ▶ Help meet the criteria for great vocabulary instruction
- ▶ Require the student to do more work than the teacher
- ▶ Increase memory through visual connections, content associations, and array based learning

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Creating Patterns and Graphic Organizers



- ▶ Use linear or hierarchical arrays or other graphic organizers to clearly show relationships.
- ▶ Make certain students can explain not only the words and concepts, but also the relationships and connections

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Getting Started with Graphic Organizers

- ▶ Meet the research criteria
- ▶ Brain friendly
- ▶ Multi-purpose
- ▶ Cross content application with little modification
- ▶ The brain craves patterns
- ▶ Motivating to reluctant writers – small spaces
- ▶ Supports concept development
 - Meant for frequent use in initial learning, repetition, and deepening thinking throughout the unit or lesson
 - Not meant for use as a summative assessment
 - Can be used for formative assessment when coupled with a Quadrant C or D (rigorous) question

54 Kuzmich, 2007

Flow Charts: Sequence or Time Sequence

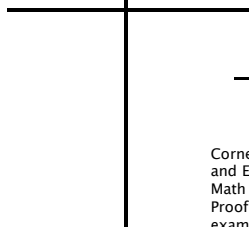
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Relational Array: Web or Tree Map or Brace Map

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Note Takers: T-Charts

DATA or IDEA
T-Chart



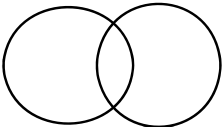
IDEA T-Chart

Cornell Notes for Social Studies and ELA, ELA Dialectic Journals, Math and Science use for Inference Proof Notes or add a column for examples

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Similarities and Differences:

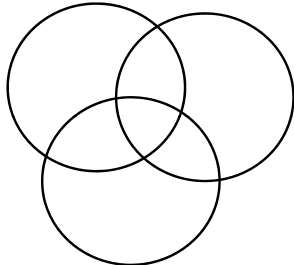
Venn Diagram



EXAMPLES – ANALYSIS OF MULTIPLES:

- Elements
- Parts
- Causes
- Conditions
- Functions
- Attributes
- Characteristics

Triple Venn




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Attribute Methods: Adapted Frayer Method

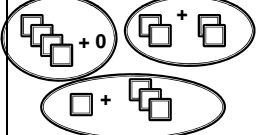
Examples	Non-examples, Characteristics or Features
Non-linguistic Representation	Use or Application – put in context
<div style="border: 1px solid black; border-radius: 50%; width: 40px; height: 40px; margin: 0 auto; display: flex; align-items: center; justify-content: center;"> Concept: </div>	
Now write your own definition	

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Frayer Method: Social Studies

<p>Examples:</p> <ul style="list-style-type: none"> •Roosevelt •Hitler •Chamberlain •Mussolini •Stalin •Hidelki Tojo 	<p>Types of Leaders:</p> <ul style="list-style-type: none"> Democratic Totalitarian Dictator Military Monarchy Fascist
<p>Concept: Leadership in WWII</p>	
<p>Non-linguistic Representation:</p> 	<p>Use or Application – put in context:</p> <ul style="list-style-type: none"> •Roosevelt's radio speeches •Hitler's triad's •Chamberlain's compromises
<p>Now write your own definition: The ability of one person to use influence to get the support of others in the accomplishment of a common goal.</p>	

Frayer Method for Quantitative Courses like Math, Physics, Chemistry, Economics and some CTE Courses

<p>Examples:</p> <p>4, 6, 8, 10, 12, 14, 15, 16,</p>	<p>Non-examples:</p> <p>0, 1, 2, 3, 5, 11, 13, 17</p>
<p>Composite Numbers</p>	
<p>Non-linguistic Representation: 4</p> 	<p>Identify Rules, Uses, or Patterns:</p> <ul style="list-style-type: none"> 4 is the lowest composite 0 and 1 are not composites Square numbers have an odd number of factors 2 is the only even number that is not a composite Prime numbers are not composites
<p>Now write your own definition: A whole number with more than two factors</p>	

Vocabulary or Semantic Feature Note Taker

- ▶ Usually in a table format on a whole sheet of paper or chart paper
- ▶ Columns can include (check the vocabulary protocol for help on columns):
 - the words connected to a topic or category
 - pictures or examples,
 - Characteristics, parts, rules, attributes
 - A definition in own or accurate words or a relevant application, creation of own example
- ▶ Students can work alone or with a partner, include dialogue on at least part of the activity
- ▶ Students use this organizer for further work or informal assessments and later for review


Semantic Feature Analysis

	Attributes, Characteristics, or Functions			
What types or cases are compared				

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63



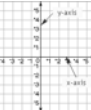

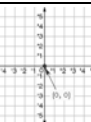
Semantic Feature Analysis: ES = 1.69 Note Taking Grid for Quadrilaterals

Geometric Shapes	Parts, Characteristics, or Attributes	Draw One	Your Own Accurate Definition
Parallelogram	<ul style="list-style-type: none"> •Quadrilateral •2 pairs of parallel sides •facing sides of a parallelogram are of equal length •opposite angles of a parallelogram are of equal measure •a direct consequence of the Euclidean Parallel Postulate 		A quadrilateral with both pairs of opposite sides parallel.
Rhombus			
Scalene Quadrilateral			
Trapezoid			
Rectangle			

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64

Coordinate Plan Semantic Feature Note-Taker

Word	Image or Example	Definition – text code this definition	Real Word
origin		The point where the x and y-axis intersect is called the origin.	Real World Uses for coordinate planes <ul style="list-style-type: none"> •Address in space •City or street map •Plotting shortest routes or path •Finding landmarks and the distance between them •Wildlife migration or movement graphs •Superman’s flight •Air traffic controllers use •Ocean or mountain rescuers use
coordinate plane		A coordinate plane is a plane formed by two intersecting and perpendicular number lines.	
Y-axis X-axis		The two number lines that intersect to form the coordinate plane are called the x-axis and y-axis. The x-axis is the horizontal number line. The y-axis is the vertical number line	
quadrant		A coordinate plane is divided into four quadrants. On the next few pages, we will look at points in the 1st quadrant.	
ordered pair		An ordered pair is a set of numbers that describe the location of a specific point on the coordinate plane. The origin is located at (0,0).	

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Semantic Feature Analysis: Science

Biomes: Aquatic or Terrestrial?	Climate and System Characteristics	Vegetation and Animal Life	Resources	Importance to the Planet
Alpine				
Chaparral				
Freshwater				
Desert				
Coral Reef				

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Semantic Analysis as Concept-Based Whole Page Note Taking Tool

Comparison of Wars

Criteria Compare these	Year	Causes	Allies	Result
WWI				
WWII				
Korea				
Viet Nam				

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67

Semantic Feature Analysis: Note Taking Grid for Literary Devices

Add a Symbol or Picture	Characteristics or Attributes	Quote that illustrates Device	Your Own Definition	Your Own Example
Foreshadowing	<ul style="list-style-type: none"> •Hints •Prediction 			
Hyperbole			An obvious and intentional exaggeration	
Metaphor	<ul style="list-style-type: none"> •Comparison without comparison words •Likeness 	"The cat's eyes were jewels, gleaming in the darkness."	A comparison in which one thing is said to be another.	The opening scene was a chilling dunk in ice water.
Simile		"She floated like a cloud."		
Personification			Giving human qualities to animals or objects.	

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68

Examples of Completed Semantic Feature Note-Taker			
Comparing Multiple Sources	Attributes or Characteristics	Function or Purpose	Actions that you could take
EBSCO Website	Searchable along more than one factor Very Current Multiple Sources	Research Find articles	Find articles related to my science project
Coordinate Plane	2 axis Positive and Negative numbers Can plot data	Plot data points and sets of points Note change in data	Plot slope of roof Plot change in acceleration
Historical Map	Key Time Scale Symbols Color coding	Capture actions, events, or other data that occur over a geographical area	Find where an event started Note resources on both sides during a war Relate to map today

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6. Carding Strategies

- › Works well and puts students to work
- › Great for review later on
- › Builds memory strategies
- › Helps students see connections



Kuzmich, 2011 70

Combining Vocabulary Strategies with Carding Methods

- › Carding methods are a way to combine examples, visuals, cues, etc. in a single activity
- › Use note cards and store in a “sealable plastic bag” in class for study
- › Create in Inspiration or Word/Publisher/PowerPoint for a higher tech method
- › Combine with online image sources like Google Pics and Tag Galaxy
- › See handout for ideas

Carding–Use both sides to:

- List the Word or concept
- Information about the word
- Picture, symbol, or example
- A definition in the student's own words
- Other as desired

Kuzmich, 2009 adapted from J. Allen 71

7. Teach Latin and Greek Word Parts Across Content Areas or at least Word Families

- › Remember: Always teach new words in context. For students, there is nothing worse than endless lists of definitions to memorize, prefixes and suffixes to stuff into the brain. Students learn not by rote memory, but through memorable examples.
- › So give examples to remember, and watch your lessons come alive.
- › The study of root words is the one truly interdisciplinary subject area. Just explore these pages to experience this truth for yourself.
- › Words learned in the study of geometry can be applied to the study of literature. Words learned in the study of history can be applied to the study of music.
- › All subject areas – from math and science, to poetry and the arts – are connected by Latin and Greek derivatives. Vocabulary grows exponentially when it is studied in this dynamic, interdisciplinary way.

<http://www.vocabulary-lesson-plans.com/> 72

Create Vocabulary Clusters with Similar Root Meanings

Vocabulary Clusters	All Words Relate to....
Biology, biosphere, biodome, bionic, antibiotic, biodegradable	"life"
Geology, paleontology, mammology	principles of" or "studies of" something
Cent, centennial, centimeter	"100"
Oxidation, peroxide, carbon dioxide	"oxygen"

Kuzmich, 2010 73

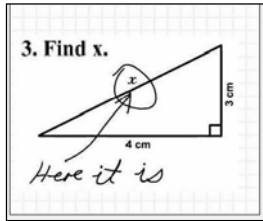
Word Families

Noun	Verb	Adjective
dependence	depend	dependable
reliance	rely	reliable
enjoyment	enjoy	enjoyable

Word Families

Noun	Verb
factor	factor
addition	add
division	divide

Not Quite What We Have in Mind...



All Thinking Starts with Concept Attainment and Development – the Heart of Great Vocabulary Instruction

Choose Brain Friendly Strategies to Improve Student Achievement

- ▶ Choose a variety that make sense for your content area.
- ▶ Meaning and connections matter.
- ▶ Rehearsal and review make a difference.



Kuzmich, 2007

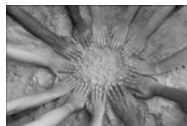
77

5. Next Steps

Your possible “to do” list:

- Implement what you learned today about the brain and learning all during the coming school year.
- Select two strategies to get you started with brain based learning and vocabulary instruction

Students who can read, write, speak, and listen with rigor and relevance can do anything given a caring environment!



Kuzmich, 2011

78

May Your Moments be Many!



“Educators are addicted to the moment when a student’s eyes light up, when the teaching becomes learning. May your days be filled with such moments.”

Philip Patrick Horenstein

Kuzmich, 2011

79



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Kuzmich, 2011

80

Vocabulary and Concept Card Activities

What follows is a list of strategies to teach words, ideas, concepts and processes. These all involve the use of notecards that students create, usually with the word and information, pictures, definitions in their own words or attributes and functions. Create the words as students' are introduced to the learning and add to the cards as students learn more. Store the cards in envelopes or zipped plastic storage bags. You can also create an electronic set of cards, but you would need to adjust the strategies below. The physical manipulation of the notecards and the act of creating them improves memory and helps students handle a large volume of new content learning. Making real world connections on the cards also adds to the memory potential. Try these strategies one at a time or combine them as you wish. Rotate the strategies to keep the approach fresh for your students who like novelty. You can also have students create electronic versions of these notecards and/or develop their own strategies to aid with memory and learning. These strategies are adapted from the work of many authors and wonderful teachers some of whom include: Authors Janet Allen, Lin Kuzmich, and some terrific teachers and consultants like Brenda Neel and JoAnn Groh.

DEFINE IT – Use “In Your Own Words” strategy. Translate the dictionary, glossary or given definition into your own words. Also add other related terms, thoughts, personal experiences that cue an association with the work. The notecard becomes a study guide and mental map of the work. Students can also create a “Fray Model” for the more abstract terms.

FLASH DOWN – Students create notecards as the teacher introduces new content words with the word on one side and a definition in their own words on the other side. Store cards in envelope or small zipped plastic bag. Each student works independently studying his or her notecards and practices the meaning. Each time the student studies the work, he or she forms the word with their mouth and says it silently, guesses the definition, and then checks for accuracy on the back of the card. Check for growth each class period as the student repeats the practice, he or she separates the cards into two piles – know it and not sure. Students can also practice together with cumulative set of vocabulary flashcards, working in pairs during the opening, transitions or closing of the lesson. For final review, teams can compete in Vocabulary Bee for a quick opening or closing activity.

VISUALIZE IT – Visuals, graphics, and non-linguistic representations are key concept and vocabulary strategies. Cut photos from magazines, draw pictures or graphics, find clipart for your vocabulary notecards. On the notecard explain the relevance of the picture or image to the word, concept, era, process, etc. In math, chemistry and physics use the word, a related problem and the visual can be a real world application of this type of mathematics. In Social Studies and ELA the student selects visuals that will help them remember events, elements, and other critical information. Visuals make vocabulary and facts more memorable for all learners, especially those learning the language, those with special needs, delayed literacy or where there is just a large quantity of vocabulary and concepts to learn.

WALK ABOUT – Use Google Images to find pictures that imply or represent words, concepts, eras, processes, etc. Hang these around the room and match your notecards to the numbered pictures. Justify why the words fit with the images. Work in pairs if desired. This activity

results in good discussion if the words are abstract concepts and require inferential thinking to match the photos.

SEQUENCING – In math and science especially, sequence of operations and processes is key. If the terms on the notecards represent the steps in the sequence, then one performance can be to order and explain the sequence. This activity works well with pairs or triads. In a large group review, give each student a card and have them stand and arrange themselves in the appropriate sequence. This also works in history, geological history, and sometimes in literature. A great way to increase the critical thinking is to take something out of the sequence or re-order it and ask a great “What if” question. Some sequences work in more than one way, and then see if students can discover more than one way to order a process, series of events, or other order/time oriented learning.

WORD SORT – This physical manipulation of the notecards on the desk can be done in many ways. Have each student sort words into categories that make sense to him or her, and then discuss that organization with a partner. Each student must do first sort alone to build their own memory capacity. Students can then help each other add labels or titles to each pile that describe the reason for the words to be in that pile.

PHYSICAL ARRAY WEB – Each student organizes their vocabulary notecards on their desk by association. They can add other terms to further association understanding, arrows or direction indicators can be added on sticky notes. Organize cards in a web or flow chart by their relationship to each other or cause and effect factors. Students explain their rationale for the arrangement to a partner. Teacher walks around to monitor for any errors or where students cannot rationalize the arrangement logically. To increase the critical thinking have pairs of students come up with one other correct way to arrange the words to show a second relationship.

CONNECT 4 - Use the teacher’s deck of notecards. Hand out one card to each student. At the signal, each student finds a partner. They read their words and make a connection or association in one or two sentences. At the next signal, each person finds the next partner and repeats the connection exercise, writing the connections and words down on a graphic organizer or note paper. Repeat until students have made 4 connections or associations. The Teacher walks around the room noting connections, giving feedback, asking questions and celebrating and “WOW” type connections. As a whole group wrap up ask students to share their “best” connection with the class. Use non-volunteering method of student response.

ROLE PLAY – Draw terms from a container or the card deck. Act out the word either individually or in small groups. Others guess the terms as with Charades. In math have students come up with a problem in pairs and post in on a white board or come up and post it. Students in the class must guess all the math terms possible associated with that problem until the right one is selected.

LIGHTS, ACTION, CAMERA – After learning the word, students close their eyes and visualize a scene in which this word or concept comes to life – much like creating a movie in the mind. Describe the “movie clip” to a partner. Some of these could be shared with the class.

Teacher should model first. Use this with larger more abstract words like democracy, probability, stem cell research, heroism, etc.

CREATE A STORY – There are multiple ways to have students use their notecards to create stories to help them remember the vocabulary, concepts, facts, etc. The teacher can pick 4 to 6 terms to be used in either a non-fiction paragraph or a creative story. Key is having the words used in an appropriate context. This context can be related to the words, nonfiction or a creative take to personify or use humor to remember terms in a metaphorical context. For example, using the vocabulary of linear equations and making up a story of a family following a sequential routine in the morning. The family’s names could be the math words. Students who struggle in math may benefit from this type of memory strategy. In history or ELA the story can be from the perspective of an unusual person, say a baker in Gettysburg during the Civil War or from the point of view of a minor character rather than the major ones in fiction.

STANDING SEMANTIC MAP – Each student has his or her cumulative notecard pack. The cards can be open on the desk. One student volunteer chooses a word, moves to the center of the room, and announces the word and what it means. Another student then chooses a word, joins the first student, and shares the word, meaning and the association with the first word. Students can continue coming up and stating word, meaning and association until the physical web is complete. If the center word needs to change, two students must justify the change. Another way to do this is to select 6 to 8 students who each select a word and then agree on a web arrangement, then explain the associations to the rest of the class. If each group has a different set of words this becomes another simple way to jigsaw learning and increase memory.

ELECTRONIC SEMANTIC MAP – Use the same strategy for the standing map, but have small groups of students create the web electronically using webbing or other software and then present their electronic web to the class including the word, definition in their own words and associate, making certain each student takes a turn present a word and an association.

CHALK TALK – Using their notecards, students move silently to large poster sheets that the teacher has created with questions for the current unit of study. Students must respond to the questions, writing on the chart paper or writing on sticky notes and hanging them on the charts, using one or more of the vocabulary terms in response. They can also respond to each others’ comments.

PICTIONARY – USE with three players in a group. Each group gets the same word from the Teacher set of cards. Student draws representation of the word. Others guess it. The visualization will help with memory.

20 QUESTIONS – One student holds a word they can’t see up to their forehead. Others in a group of 3 or 4 offer clues until the student guess the word or concept. This old game is a great memory strategy.

SCATTEGORIES – Teacher creates “play lists” – set of descriptors that relate to the vocabulary in the notecards. The play list can be displayed electronically or offered to each small group on small separate cards. Students play in teams to guess the best vocabulary word that fits

the descriptor. Roll the Scattergories dice to determine the initial letter for this round. Students should refer to notecards as needed, depending on when you use the game within the unit of study. While this strategy is a simple form of matching, you can add twists by having students find the descriptors that meet criteria and then find the word. For example, find all the descriptors that have to do with World War II or linear equations. The criteria further help students deepen understanding of content clues and increase memory.

Progressive Quizzing – Students use the notecards on daily checks for understanding or informal assessments such as “Quick Writes” as you proceed through the unit. Remember that the goal is for students to learn the words – not tallying. Building in supports early builds success. Gradually remove the use of the notecards for example on Day 1 use the whole pack as an aid, on Day 3 the student can select the 3 to 5 cards they still need to remember and use. And at the end of the unit go without the cards. This gradual scaffolding away from the notecards with the student determining what they still need help on supports memory and builds independent capacity for learning.

WORD WALL WORK – Use the Teacher or student set of larger notecards (with visuals and examples) to create a class wall that shows the relationship between and among words, facts and concepts. Word walls in content areas that are alphabetical don’t tend to assist memory well. Creating a relational array such as a web, sequence, flow chart or categories arrangement works much better to promote memory and learning. Engaging students in creating the word wall is a good study strategy, and then the teacher can use it for follow up, inviting students to come up and add to the wall, show new visuals or examples or show new relationships.

Review of “isms”

Directions: Match the Picture with the word. Place the number of the correct picture next to the right “ism” and then list things in the picture, evidence to support your selection. If you and your partner disagree, you may have a different match up for some of the words. Just be certain to site the observable evidence along with your background knowledge.

Term	Number of Correct Picture	Evidence for your conclusion in the visual and from your background knowledge
Fascism		
Imperialism		
Capitalism		
Nationalism		
Communism		
Industrialism		
Expansionism		
Socialism		

Did you and your partner agree? Why or why not?

Name _____

Date _____

Directions: Pick a scientific phenomenon, model, system or energy concept. Describe it and write words that are best associated with it. Describe characterizes and give real life examples.

Scientific Topic or Area: _____

Describe a scientific phenomenon, model, system, or energy concept:

What is it like and what are the characteristics or rules associated with this:

Science words associated with this process and meanings.

Picture or Diagram:

Real World Examples of this scientific information or the Importance of the Information:

Your study tips for remembering this information:

Name:

Date:

Math Class:

Notes for: (Type of Math or Math Skill Set)

Problem and How to Do it: Label problem with proper math vocabulary.	Rules or steps for this type of problem:
Problem and How to Do it: Label problem with proper math vocabulary.	Rules or steps for this type of problem:

COMMON LATIN AND GREEK ROOTS

Many English words and word parts can be traced back to Latin and Greek. The following table lists some common Latin roots.

Latin root	Basic meaning	Example words
-dict-	to say	contradict, dictate, diction, edict, predict
-duc-	to lead, bring, take	deduce, produce, reduce
-gress-	to walk	digress, progress, transgress
-ject-	to throw	eject, inject, interject, project, reject, subject
-pel-	to drive	compel, dispel, impel, repel
-pend-	to hang	append, depend, impend, pendant, pendulum
-port-	to carry	comport, deport, export, import, report, support
-scrib-, -script-	to write	describe, description, prescribe, prescription, subscribe, subscription, transcribe, transcription
-tract-	to pull, drag, draw	attract, contract, detract, extract, protract, retract, traction
-vert-	to turn	convert, divert, invert, revert

From the example words in the above table, it is easy to see how roots combine with prefixes to form new words. For example, the root *-tract-*, meaning “to pull,” can combine with a number of prefixes, including *de-* and *re-*. *Detract* means literally “to pull away” (*de-*, “away, off”) and *retract* means literally “to pull back” (*re-*, “again, back”). The following table gives a list of Latin prefixes and their basic meanings.

Latin prefix	Basic meaning	Example words
co-	together	coauthor, coedit, coheir
de-	away, off; generally indicates reversal or removal in English	deactivate, debone, defrost, decompress, deplane
dis-	not, not any	disbelief, discomfort, discredit, disrepair, disrespect
inter-	between, among	international, interfaith, intertwine, intercellular, interject
non-	not	nonessential, nonmetallic, nonresident, nonviolence, nonskid, nonstop
post-	after	postdate, postwar, postnasal, postnatal
pre-	before	preconceive, preexist, premeditate,

		predispose, prepossess, prepay
re-	again; back, backward	rearrange, rebuild, recall, remake, rerun, rewrite
sub-	under	submarine, subsoil, subway, subhuman, substandard
trans-	across, beyond, through	transatlantic, transpolar

Words and word roots may also combine with suffixes. Here are examples of some important English suffixes that come from Latin:

Latin suffix	Basic meaning	Example words
-able, -ible	forms adjectives and means “capable or worthy of”	likable, flexible
-ation	forms nouns from verbs	creation, civilization, automation, speculation, information
-fy, -ify	forms verbs and means “to make or cause to become”	purify, acidify, humidify
-ment	forms nouns from verbs	entertainment, amazement, statement, banishment
-ty, -ity	forms nouns from adjectives	subtlety, certainty, cruelty, frailty, loyalty, royalty; eccentricity, electricity, peculiarity, similarity, technicality

Greek Roots, Prefixes, and Suffixes

The following table lists some common Greek roots.

Greek root	Basic meaning	Example words
-anthrop-	human	misanthrope, philanthropy, anthropomorphic
-chron-	time	anachronism, chronic, chronicle, synchronize, chronometer
-dem-	people	democracy, demography, demagogue, endemic, pandemic
-morph-	form	amorphous, metamorphic, morphology
-path-	feeling, suffering	empathy, sympathy, apathy, apathetic, psychopathic
-pedo-, -ped-	child, children	pediatrician, pedagogue
-philo-, -phil-	having a strong affinity or love for	philanthropy, philharmonic, philosophy

-phon-	sound	polyphonic, cacophony, phonetics
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The following table gives a list of Greek prefixes and their basic meanings.

Greek prefix	Basic meaning	Example words
a-, an-	without	achromatic, amoral, atypical, anaerobic
anti-, ant-	opposite; opposing	anticrime, antipollution, antacid
auto-	self, same	autobiography, automatic, autopilot
bio-, bi-	life, living organism	biology, biophysics, biotechnology, biopsy
geo-	Earth; geography	geography, geomagnetism, geophysics, geopolitics
hyper-	excessive, excessively	hyperactive, hypercritical, hypersensitive
micro-	small	microcosm, micronucleus, microscope
mono-	one, single, alone	monochrome, monosyllable, monoxide
neo-	new, recent	neonatal, neophyte, neoconservatism, neofascism, neodymium
pan-	all	panorama, panchromatic, pandemic, pantheism
thermo-, therm-	heat	thermal, thermometer, thermostat

Words and word roots may also combine with suffixes. Here are examples of some important English suffixes that come from Greek:

Greek suffix	Basic meaning	Example words
-ism	forms nouns and means “the act, state, or theory of”	criticism, optimism, capitalism
-ist	forms agent nouns from verbs ending in -ize or nouns ending in -ism and is used like -er	conformist, copyist, cyclist
-ize	forms verbs from nouns and adjectives	formalize, jeopardize, legalize, modernize, emphasize, hospitalize, industrialize, computerize
-gram	something written or drawn, a record	cardiogram, telegram
-graph	something written or drawn; an instrument for writing, drawing, or recording	monograph, phonograph, seismograph
-logue, -log	speech, discourse; to speak	monologue, dialogue, travelogue

-logy	discourse, expression; science, theory, study	phraseology, biology, dermatology
-meter, -metry	measuring device; measure	spectrometer, geometry, kilometer, parameter, perimeter
-oid	forms adjectives and nouns and means “like, resembling” or “shape, form”	humanoid, spheroid, trapezoid
-phile	one that loves or has a strong affinity for; loving	audiophile, Francophile
-phobe, -phobia	one that fears a specified thing; an intense fear of a specified thing	agoraphobe, agoraphobia, xenophobe, xenophobia
-phone	sound; device that receives or emits sound; speaker of a language	homophone, geophone, telephone, Francophone

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Revised Bloom's Taxonomy

	Remember	Understand	Apply	Analyze	Evaluate	Create
Verbs	Choose Describe Define Find Identify Label List Locate Match Memorize Name Omit recall Recite Recognize Reproduce Sequence- simple Select State Tell	Calculate Classify Demonstrate Distinguish Explain Extend Give example Illustrate Indicate Interrelate Interpret Infer Judge Match Paraphrase Represent Restate Rewrite Show Summarize	Apply Chose Dramatize Explain Generalize Judge Organize Paint Prepare Problem- calculation Produce Select Sequence- complex Show Sketch Solve Use	Analyze Categorize Cause/Effect Classify Compare Complex-Infer Contrast Deduce Differentiate Distinguish Identify Point out Organize Select Subdivide Survey	Appraise Argue Estimate Evaluate Determine- bias Judge Criticize Critique Debate Defend Justify Prioritize Pros and Cons Rate Value Verify Weigh	Add to Combine Compose Construct Create Design Develop Devise Forecast Formulate Predict Solution Formulate Hypothesize Invent Originate
Instructional Strategies	Highlighting Rehearsal Memorizing Mnemonics Make a list of the main events Make a timeline of events Make a facts chart Write a list of any pieces of information you can remember List all the .. in the text or video	Key examples Emphasize connections Elaborate concepts Summarize - written Paraphrase – oral Students explain Students state the rule Why does this example...? Visual representations Concept maps Outlines- verbal Flow chars Graphic Organizers	Students modeling Sequencing Real World application opportunities Case studies Simulations Algorithms in problem form Construct a model, diorama, scrapbook, to explain ideas or information in context Organize a collection to make a point Make up a game Write an outline	Analogies Models of thinking Challenging assumptions Retrospective analysis Reflection through journaling Collaborative learning like jigsaws Design a questionnaire to gather information Construct a data chart Write a commercial to sell something Conduct an investigation to support a point of view or hypothesis	Challenging assumptions Evaluative journaling Debates Collaboration to evaluate point or view, worth or other specific aspect Decision-making Solution development Problem based learning Prepare a list of criteria to judge... Self evaluate and then correct your work Prioritize and rationale Justification in writing or verbally Critique art or music or theater – any art form	Design activities Inventions Creation of a model of a solution to a complex problem Devise a new way to solve a complex problem Compose music Create original art
Model Questions	Who? Where? Which one? What? How? What is the best one? Why? How much? When? What does it mean?	State in your own words Which are facts? What does this mean? Is this the same as... Give an example Condense this paragraph or paraphrase it Explain what is happening What are they saying? What seems to be...? What seems likely? What is the main idea?	Predict what would happen if... Choose the best statements that apply What would result Tell what would happen Tell how, when, where and why Tell how much change there would be Identify the results of... What is the function of...?	Is this fact or opinion and why? What are the assumptions behind...? What is the relevance? What is the motive? What are the conclusions based upon? What does the author believe or assume? Make a distinction State the point of view, rule or pattern What is the relationship between..?	Is it valid that? Judge the effects What fallacies, consistencies, inconsistencies appear or exist? Which is more important, moral, better, logical, valid, or appropriate? Find the errors Defend your point of view or this viewpoint or answer Justify your answer or response or point of view Is bias, fairness, or ethics at issue?	How would you test...? Propose an alternative. Develop a creative solution for... Invent a new process, system, procedure or product that addresses...

Source: Bloom (1954) revised by Anderson and Krathwohl (2001)

ABOUT LIN KUZMICH

Lin Kuzmich is an educational consultant and bestselling author from Loveland, Colorado. She served Thompson School District in several roles as the Deputy Superintendent, Executive Director of Secondary and Elementary Instruction, Director of Professional Development and she was a building principal for nine years. Lin's school was named a 2000 winner of the John R. Irwin Award for Academic Excellence and Improvement. In addition, for the past decade she was involved in staff development through several universities and the Tointon Institute for Educational Change. Lin served as an Adjunct Professor and Instructor at Colorado State University and University of Northern Colorado in the Principal Preparation Programs. She is a Senior Consultant for the International Center for Leadership in Education. Lin also provides training and consulting to school districts around the country and presents at numerous national and international conferences. Lin Kuzmich can be reached at 970-669-2290 (home/office) 970-203-4176 (cell) or kuzenergy@gmail.com and her website is www.KuzmichConsulting.com

Lin's additional experience includes: Assistant Director of Special Education (1988-1991); Vision Specialist and Reading Teacher for Thompson School District (1979-1988). She also taught high school reading, high school and middle school English/Language Arts, K-12 special education and 4th - 6th grades for Denver Public Schools (1974-79). Lin earned the *Teacher of the Year Award* for Denver Public Schools in 1979 and was *Northern Colorado Principal of the Year in 2000* for Colorado Association of School Executives.

Lin currently works with schools and districts across the country that are struggling to meet the needs of diverse learners, the requirements of AYP and the changing educational practices needed for the future success of our students. Lin's work with schools improves achievement results for students and increases the capacity of staff. Lin is passionate about helping educators prepare today's students for a successful future.

Lin's Publications:

- Stretch Learning Handbook- With Units and Strategies Aligned to Common Core State Standards (2011) International Center for Leadership in Education
- "Manage the Molehill Before It Becomes a Mountain: Keeping Parent Interactions Productive for Students" in Leadership for Family and Community Involvement Edited by Cole, Blankstein and Houston for the Soul of Leadership Series (2010) Corwin Press
- Stretch Learning: Rigor and Relevance for an Unpredictable World (2010) International Center for Leadership in Education. (Multi-Media Kit)
- Student Team That Get Results: Teaching Tools for the Differentiated Classroom (2010) Corwin Press, co-author Gayle Gregory.
- "Test Preparation Strategies that Have High and Quick Payoff," (March 2010) Successful Practices Network Monthly Online Publication
- "Ensuring Access through Differentiated Instruction" in The Special EDge, Vol. 21, Num. 3 Summer 2008, co-authored with Dr. Willard Daggett
- Redefining Literacy in Grades 7-12: Strategies for Document, Technological and Quantitative Literacy (May 2007) International Center for Leadership in Education. (Multi-Media Kit)
- Teacher Teams that Get Results: 61 Strategies for Sustaining and renewing Professional Learning Communities (January 2007) Corwin Press, co-author Gayle Gregory. (Bestseller)
- "Redefining Literacy for the 21st Century," (2006a) Successful Practices Network Monthly Online Publication
- "Tips for Credit Recovery Programs," (December 2006b) Successful Practices Network Monthly Online Publication
- Differentiated Literacy Strategies for Student Growth Grades 7-12, (2005b), Corwin Press, co-author Gayle Gregory. (Bestseller)
- Differentiated Literacy Strategies for Student Growth Grades K-6, (2005a) Corwin Press, co-author Gayle Gregory. (Bestseller)
- Data Driven Differentiation in the Standards Based Classroom, (2004) Corwin Press, co-author Gayle Gregory. (Bestseller)
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