


Taking Writing Deeper



With Lin Kuzmich
Port Huron Area School District
Science HS
April 2013

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Taking Writing Deeper

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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



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Our Session Agenda






1. Introduction
2. Tiered Vocabulary
3. Spelling Tips*
4. Ideas for Building Sentences* and Paragraphs
5. Analytic Writing Tips
6. Scaffolding Argumentation
7. Next Steps

* For ELA

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1. Introduction

- ▶ Why is writing a skill and not a subject?
- ▶ What successes are your students having with writing?
- ▶ What successes would you like to see by next year?






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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, L. (2011) *Stretch Learning Handbook* Rexford, NY: ICLE.

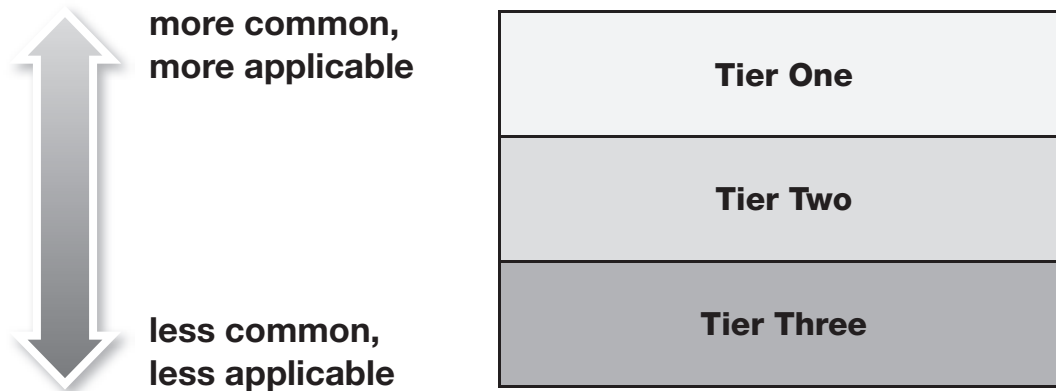
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Understanding Academic Vocabulary

Learning and using academic words strengthen understanding of complex texts and increase content-area knowledge.

Three Tiers of Vocabulary

The Common Core State Standards categorize vocabulary using a three-tiered system. Tier One words are common words used in everyday speech. Tier Two words are general academic words used across a broad range of disciplines. Tier Three words might represent precise language for Tier One words, such as *chaos* and *sympathetic* instead of *mess* and *nice*. Tier Three words are less common academic words that apply to specific topics and content areas.



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	Tier One Words	Tier Two Words	Tier Three Words
Definition	<ul style="list-style-type: none"> • Words of everyday speech • Used in a variety of topics and contexts • Rarely require instruction 	<ul style="list-style-type: none"> • General academic words • Portable, high-frequency words used across content areas • Represent mature language use • Often require instruction 	<ul style="list-style-type: none"> • Domain-specific academic words • Low-frequency words used in specific content areas • Represent specialized content knowledge • Always require instruction
Examples	rule, parts, clock, baby, happy, walk	policy, components, coincidence, evaluate, manual, specific	legislation, indices, juxtaposition, personification, irony

Explicit Vocabulary Instruction at the Secondary Level Includes...

Introduce and Practice

1. Pronounce the word for students.
2. Students repeat word verbally more than once.
3. Discuss relevant examples using context.
4. Explain its meaning in various (or at least one) contexts.
5. Students visualize and describe or create a visual or example where possible.
6. Deepen understanding with prompts for student conversation and collaboration that require the use of taught vocabulary.

Reinforce and Practice

7. Students use vocabulary in written responses.
8. Where possible students put the definition in their own words such as in ELA and Social Studies or remember the precise definition such as in Science and Math.

Review and Practice

9. Review with CLOZE sentences, completion thinking frames, or identify further meaning(s) and use(s) in text passages, or in visual contexts.

Assess

10. Assess only after using most strategies above.

Brain Tip: It takes more than one day to practice words enough to remember them long term. You need sleep cycles to reinforce learning and create memory.

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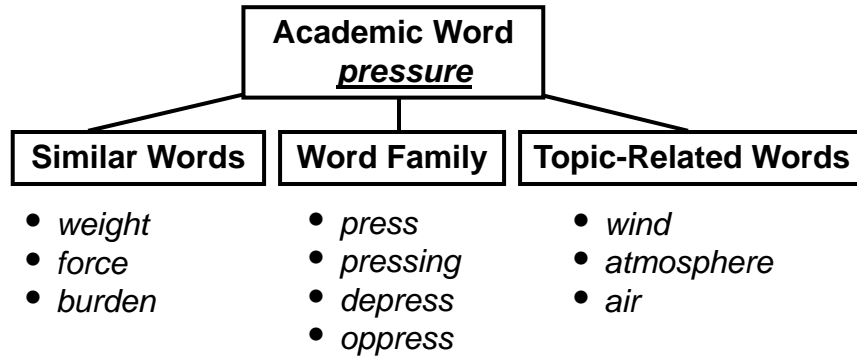
Key Vocabulary and Concept Strategies with Very High Payoff

- Root words, prefixes and suffixes
- Games
- Completion sentence frames
- Semantic Note Taker and other graphic organizers
- Semantic Feature Analysis
- Concept Maps
- Creating visual representations
- Introduce with video clips
- Develop patterns, attributes, connections, examples, characteristics and functions
- Use or create analogies, similes, or metaphors
- Use in writing
- Use in student to student dialog
- Create categorized and connected word walls or create a personal word web, tree or category map in notes

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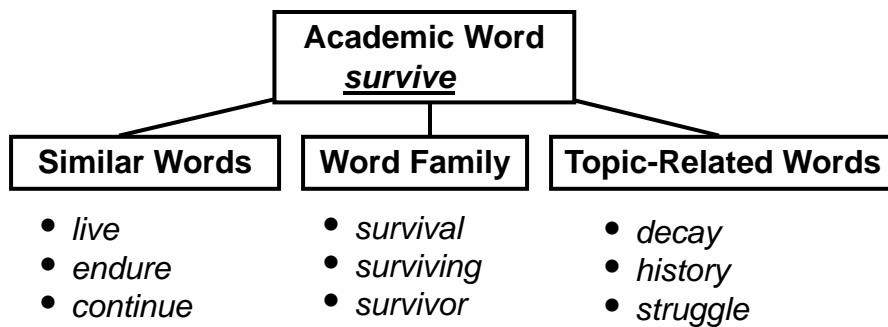
Classifying Words: MS



Examples from Scholastic, Inc. 22012

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Building Word Clusters: 9-12

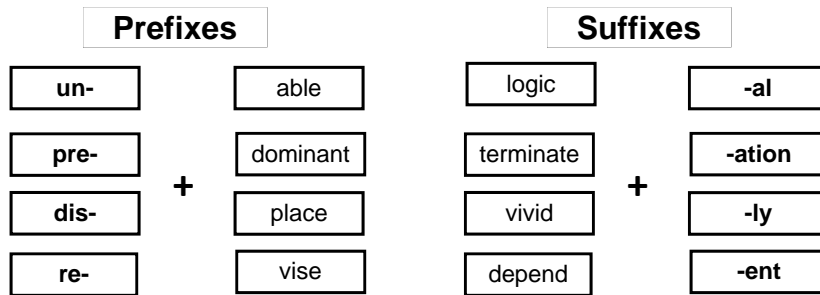


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Examples from Scholastic, Inc.
22012

Using Morphemes to Make Meaning

Morpheme: the smallest meaningful unit in a language; a word part that can be added to a root word (*un-*, *pre-*, *dis-*, *-al*, *-sion*, *-ation*, *-ly*)



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Strategies that Work with ELL/SPED

1. **Recognition of the word in context:** As I point to the endoplasmic reticulum picture I say, "Is this an endoplasmic reticulum?" The students say in unison, "Yes." As I point to a picture of a ribosome I say, "Is this a vacuole?" Hopefully they respond, "No." As a total physical response (TPR) methodology, I can ask them to stand next to or point to the mitochondria, chloroplasts, etc.
2. **Reproduction of the words in context:** After going through all the words, I ask them to say the words aloud, as I point to such things as the nucleus. After I am satisfied they can say the words, then I check their understanding, "Which organelle of the cell processes energy for the nucleus?" (Mitochondria/chloroplasts). "Which parts of the cell are necessary to create proteins?" (Endoplasmic Reticulum, nucleus, Golgi apparatus, and ribosomes).

Strategies that Work with ELL/SPED

3. **Written words in context:** I then start bringing out the written-word strips and ask the students to match them with the pictures. Then, and only then will I let the students start reading the chapters, or workbooks, because, not only are they now familiar with the concepts, but they have muscle memory of the words in their mouths and know how to say them and thus remember them. This method is more enjoyable and more effective for students than writing the words ten times each in sentences, an all too-typical vocabulary development technique.

Ben Johnson In [Edutopia](#), 2012

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Selecting Words for Learning

- Does the word derive organically from text?
- Is the word essential to understanding the text?
- Is the word precise and useful in a wide variety of contexts?
- Does the word lend itself to rich, varied, and engaging instruction?
- Can the word be explained in student friendly language or the precise language or content?
- Does the word reveal something about the author's choice of language in the Humanities, CTE or Research?

Adapted from CCSS and Scholastic by Kuzmich, 2012

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5. Analytic Writing

There are Three
Types of Analytic
Writing

- ▶ Rhetorical
- ▶ Process
- ▶ Causal
- *compare and contrast



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Rhetorical Analysis

Definition: To analyze the rhetoric of a text is to figure out how it persuades its readers. Rhetorical analysis is not directly concerned with whether the text's assertions are correct, just how the author of a text goes about the persuasion or argument.

Tools Used in
Rhetorical Analysis:

- ▶ Linguistics - use of words
- ▶ Citing of references or other sources
- ▶ **Prerequisite writing Skill: Writing a Summary**
- ▶ Teach the Four Step Rhetorical Précis

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Questions to Answer in Rhetorical Analysis – Initial Questions

- ▶ What is the thesis of the selection?
- ▶ What reasons does the author give for me to believe this thesis?
- ▶ What other points of view does the author acknowledge or explore?
- ▶ Who is the intended audience and why?
- ▶ Is the author a credible, charismatic, or other type of source? How do you know?
- ▶ Where was this text published and when?

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Questions to Answer in Rhetorical Analysis – In Depth Questions

- ▶ Does the context, times or conditions in which the author wrote the text influence the argument?
- ▶ By what means does the text seek to persuade its readers of the thesis? By appealing to their emotions, their fears, by citing authorities, by recounting personal experience, observation or research and the use of empirical data like statistics, tables and graphs? (Ethos, Logos, Pathos)
- ▶ Does the author call for any action on the readers part? (¡Andale!)
- ▶ How does the author build his/her own credibility?
- ▶ How does the author's word choice impact the argument? What do the choices reveal about the thesis, the context or the author?
- ▶ How do the citations or references impact the thesis?
- ▶ Does the text welcome or exclude the audience? Why? How does tone play a role in this?
- ▶ Who is the intended audience and why?
- ▶ Is the author a credible, charismatic, or other type of source? How do you know?
- ▶ Where was this text published and when?
- ▶ Does the text assume that you the reader feel the evidence is sufficient for the author to support his/her thesis?
- ▶ To what extent does the text consider counter evidence or alternative points of view? Are these given serious consideration or are they "hot down" without a trial?
- ▶ What does the text learn out?
- ▶ How is the text organized and does this contribute to the argument?
- ▶ What stance does the author take toward the audience, father, teacher, authority, etc.?
- ▶ To what extent does the text acknowledge the complexity of the issue or does it make the issue seem simple with one right answer?

Drew University Student Writing Tips, 2013

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Reader's Summary

In “seven Secrets to a Great Nap,” a Newsweek Web exclusive, Sarah Kliff reports that naps are good ways for adults to be more productive and alert on the job. She presents an upbeat list of seven tips for good naps, based on the findings from sleep researchers and on an interview with a sleep expert, Helene Emsellem. The first step is having a cup of coffee before a 20 to 30 minute nap. The caffeine takes about 20 minutes to kick in and so it wakes you up. The next three tips suggest the best scheduling for a nap, the best timing and the best location. The last three tips suggest ways to avoid problems, with naps. Kliff suggests setting an alarm, working naps into a consistent overall sleep pattern, and making sure you get enough sleep at night. She says that anyone who regularly gets eight hours of sleep but still regularly needs a nap might have a sleep disorder or health problem that needs checking.

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Rhetorical Précis

In her online article “Seven Secrets of a Great Nap” (2007), Sarah Kliff reports that midafternoon naps are good for adults and lists several tips from researchers for getting the most out of a nap. Kliff supports her claim by analyzing advice from sleep researchers on the benefits of drinking coffee just before a nap, on the best ways to schedule a nap, and on ways to avoid problems with naps. Her intended audience seems to be busy young professionals who surf the Web (this is an online article) and who must be hooked into a quick read through causal vocabulary such as “sleep doc” and “cup of joe” and upbeat advice. Kliff’s purpose is to inform readers that naps are beneficial from a scientific perspective and to offer surprising, helpful, and positive information about naps in an upbeat, easy to digest way in order to encourage her readers to try napping.

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Rhetorical Précis

A rhetorical précis differs from a summary in that it is a less neutral, more analytical condensation of both the content and method used in the original text. You might want to think of a précis as a brief representation of what the text both says and does. Writing a précis shows you understand how the text works rhetorically, including the author's point of view or claim, evidence or arguments, intended audience and action needed or emotion the author wants from the reader.

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Rhetorical Analysis of an Author's Argument: Rhetorical Précis

Who is this author and why should we believe him/her?

What is the argument?

Who is the intended audience?

What does the author want us to care about or do?

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Rhetorical Stance – Use in ELA or Social Science

Rhetorical Stance is a form of writing or speaking in which the student pretends they are an author, director, character, person from another time or famous person currently. The pretense in the writing is that this person makes a claim and it is supported with attention to audience. This is a very difficult and complex form of Rhetorical Analysis however is useful in developing deep comprehension, empathy or changes in beliefs or behavior. It is a form of a role play in written form or a congruent speaking format with the individual being imitated.

Tips for writing or performing a Rhetorical Stance:

- ▶ Before writing make a list of devices, unique tone words, rhetorical verbs, and dialog methods that make the author's, director's or character's voice unique.
- ▶ Select a method of communication: letter, role play, political speech, additional stanza, scene or section of text, a message sent via media of some type such as video or a Public Service Announcement.
- ▶ Plan out the message making certain the claim or thesis is maintained and the voice or tone replicate the person you are intending to imitate, play attention to the intended audience, use evidence or descriptors to support your claim, evoke emotional or create a call to action.

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Process Analysis

Definition: offers the steps by whereby an effect is achieved. Demonstration of comprehension about how the end result or product occurs. There are multiple types of process analysis:

1. Read a process that explains how to create an effect such as a recipe, supply and demand, or the election process in the United States.
2. Follow the steps of a process such as a mathematical problem or steps in negotiating a treaty.
3. Replicate a process toward an effect such as a science experiment or deployment of troops in a conflict.
4. In addition, students should be able to write analyzing structure, patterns, rules or cycles.

Tools Used in Rhetorical Analysis:

- ▶ Linguistics – use of words
- ▶ Sequential language
- ▶ Sequential organization
- ▶ Comprehension of how something works
- ▶ Understand how the end product occurs
- ▶ Procedural comprehension
- ▶ Authentication of Sources for process analysis
- ▶ **Prerequisite writing skill: Write an explanation**

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Questions to Answer in Process Analysis – Initial Questions

- ▶ What is the order of the steps?
- ▶ What is a description of each of the steps?
- ▶ What is a description of the structure or cycle?
- ▶ Can you summarize a process in an introduction?
- ▶ What is the significance or importance of the process?
- ▶ What is the intended impact, effect or result?
- ▶ Why is the impact, effect or result important or significant?
- ▶ Are there alternative ways to do this process or achieve this effect or is there counter evidence for this process?
- ▶ What patterns do you see or understand?

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Questions to Answer in Process Analysis – In Depth Questions

- ▶ What thesis does your process analysis support?
- ▶ Do the steps follow a strict chronological order or could you vary the order? Why or under what circumstances?
- ▶ Can you use a comparison and contrast or narrative to set up the process analysis? How will you know if this strategy is successful?
- ▶ What type of results, creation, comprehension, or behavior modification does the process analysis need to have as an objective? What cues in your writing will lead you to that answer?
- ▶ What language, tone and style choices must you make for this process analysis to be effective?
- ▶ To what extent does will reader's of your process analysis be able to deeply comprehend the intended result of the process?
- ▶ Who is the intended audience for this process analysis? What will you need to do in your writing to reach this audience?

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Explaining Your Work

A. What are you explaining or describing?

B. Step One

B. Step Two

B. Step Three

C. Add a tip or suggestion to conclude

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Causal Analysis

Definition: focuses on why an event happens, detailed analysis of the causes for a given effect. Sometimes use of the “why” to predict future effects is part of causal analysis. Key in analytic skill across content areas.

Tools Used in Rhetorical Analysis:

- ▶ Linguistics – use of words
- ▶ Cause and Effect Analysis
- ▶ **Prerequisite Writing Skill: Descriptive Writing**
- ▶ Process analysis
- ▶ Use of evidence and counter evidence
- ▶ Source Authenticity

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Questions to Answer in Causal Analysis – Initial Questions

- ▶ Why does this effect or impact occur?
- ▶ What is the major cause?
- ▶ What are the major causes?
- ▶ What are the contributing factors for a given effect or result?
- ▶ What data supports this result or effect? Why?
- ▶ What are other factors that contribute to the thesis or result? What are alternative interpretations?

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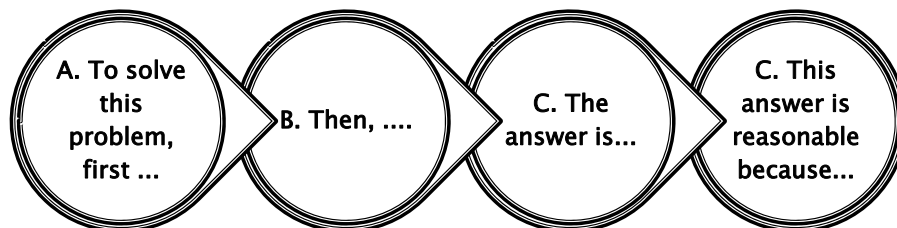
Questions to Answer in Causal Analysis – In Depth Questions

- ▶ In your introduction what is the thesis (effect) and what causal factor(s) contributed to the thesis? Why is it useful to identify the causes of this effect?
- ▶ What is a plausible explanation for the phenomena? Why is it plausible?
- ▶ What makes the causal factors complex? The number, impact, the enormity of the result, the context, the human toll, etc. could be used in explaining the complexity.
- ▶ Is the number of factors contributing to the effect expected or unique? Why?
- ▶ How did the central tendencies or the effect occur? What impacted the visual or quantitative distribution of the data? Why? (especially useful in science, math, economics, technical courses and social science including cultural geography)
- ▶ What other possible causes might an intelligent, well-informed person offer? Why don't you subscribe to those explanations?
- ▶ What are the mediating causes or mitigating factors? What causes the causes?
- ▶ What are your recommendations (conclusions) appropriate to the task or prompt?
- ▶ What mode of writing best helps you with your thesis or the cause analysis of an effect? Some modes, depending on prompt or task, might include: Narration, explanation or description, classification, comparison, contrast, or argumentation.

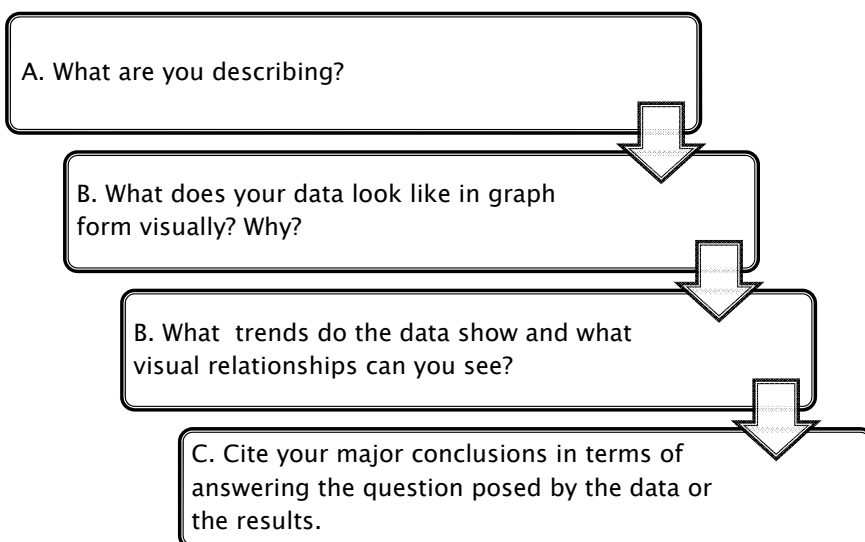
Drew University Student Writing Tips, 2013

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Causal Analysis for Math: Problem Justification Example



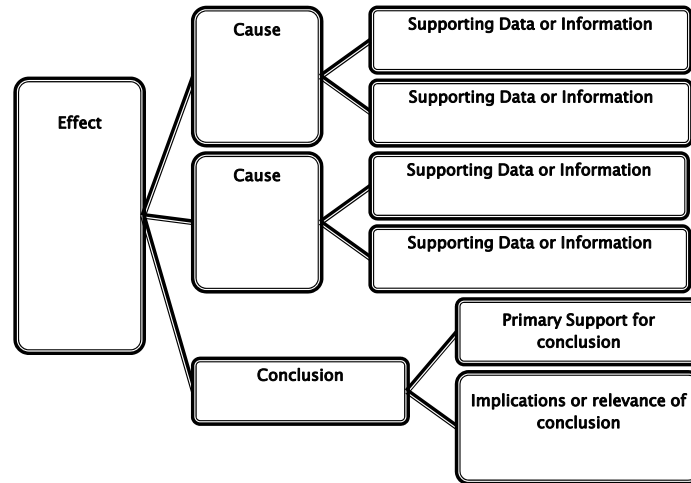
Causal Analysis of Data in a Graph, Chart, or Table



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Causal Analysis Writing



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Online Resources and Books

Online sites:

- ▶ OWL – Purdue
- ▶ Drew University– user’s guide for writing
- ▶ Digital History of the US
- ▶ NeoK12
- ▶ Teaching Channel

Books:

Reading Rhetorically

Writing Rhetorically

Voice Lessons for Writing (books for each grade level for ELA)

Sentence Composing for Middle School (There is also an elementary version for lower performing students at middle level or for use at the elementary level.)

Sentence Composing for High School

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6. Scaffolding Argumentation

Developmental Steps:

1. Opinion (Toddler–PreK)
2. Opinion with speculative or social/experiential justification (PreK–K)
3. Opinion with supported justification or proof from text or sources of information (K–2)
4. Persuasion (2–5)
5. Bridged Argumentation (5–8)
6. Argumentation (9–12)



7. Planning Next Steps

Where will you start given the needs of your students?

Please number these in order of priority for your students. #1 is the highest priority

- Vocabulary
- Paragraphs
- Analytic Writing
- Argumentation Writing

► Write Your Plan Here:

Identifying Academic Words

Linguist Averil Coxhead developed this list of Tier One and Two words most frequently found in complex texts across content areas. The list, which contains “headwords,” or the main words in each family of academic words, applies to Grades 2–12.

A	area	clause	constitute	demonstrate
abandon	aspect	code	constrain	denote
abstract	assemble	coherent	construct	deny
academy	assess	coincide	consult	depress
access	assign	collapse	consume	derive
accommodate	assist	colleague	contact	design
accompany	assume	commence	contemporary	despite
accumulate	assure	comment	context	detect
accurate	attach	commission	contract	deviate
achieve	attain	commit	contradict	device
acknowledge	attitude	commodity	contrary	devote
acquire	attribute	communicate	contrast	differentiate
adapt	author	community	contribute	dimension
adequate	authority	compatible	controversy	diminish
adjacent	automate	compensate	convene	discrete
adjust	available	compile	converse	discriminate
administration	aware	complement	convert	displace
adult	B	complex	convince	display
advocate	behalf	component	cooperate	dispose
affect	benefit	compound	coordinate	distinct
aggregate	bias	comprehensive	core	distort
aid	bond	comprise	corporate	distribute
albeit	brief	compute	correspond	diverse
allocate	bulk	conceive	couple	document
alter	C	concentrate	create	domain
alternative	capable	concept	credit	domestic
ambiguous	capacity	conclude	criteria	dominate
amend	category	concurrent	crucial	draft
analogy	cease	conduct	culture	drama
analyze	challenge	confer	currency	duration
annual	channel	confine	cycle	dynamic
anticipate	chapter	confirm	D	E
apparent	chart	conflict	data	economy
append	chemical	conform	debate	edit
appreciate	circumstance	consent	decade	element
approach	cite	consequent	decline	eliminate
appropriate	civil	considerable	deduce	emerge
approximate	clarify	consist	define	emphasis
arbitrary	classic	constant	definite	empirical



enable	final	implicate	invest	military
encounter	finance	implicit	investigate	minimal
energy	finite	imply	invoke	minimize
enforce	flexible	impose	involve	minimum
enhance	fluctuate	incentive	isolate	ministry
enormous	focus	incidence	issue	minor
ensure	format	incline	item	mode
entity	formula	income	J	modify
environment	forthcoming	incorporate	job	monitor
equate	found	index	journal	motive
equip	foundation	indicate	justify	mutual
equivalent	framework	individual	L	N
erode	function	induce	label	negate
error	fund	inevitable	labor	network
establish	fundamental	infer	layer	neutral
estate	furthermore	infrastructure	lecture	nevertheless
estimate	G	inherent	legal	nonetheless
ethic	gender	inhibit	legislate	norm
ethnic	generate	initial	levy	normal
evaluate	generation	initiate	liberal	notion
eventual	globe	injure	license	notwithstanding
evident	goal	innovate	likewise	nuclear
evolve	grade	input	link	O
exceed	grant	insert	locate	objective
exclude	guarantee	insight	logic	obtain
exhibit	guideline	inspect	M	obvious
expand	H	instance	maintain	occupy
expert	hence	institute	major	occur
explicit	hierarchy	instruct	manipulate	odd
exploit	highlight	integral	manual	offset
export	hypothesis	integrate	margin	ongoing
expose	I	integrity	mature	option
external	identical	intelligent	maximize	orient
extract	identify	intense	mechanism	outcome
F	ideology	interact	media	output
facilitate	ignorant	intermediate	mediate	overall
factor	illustrate	internal	medical	overlap
feature	image	interpret	medium	overseas
federal	immigrate	interval	mental	P
fee	impact	intervene	method	panel
file	implement	intrinsic	migrate	paradigm

Identifying Academic Words *(continued)*

paragraph	project	respond	statistic	trace
parallel	promote	restore	status	tradition
parameter	proportion	restrain	straightforward	transfer
participate	prospect	restrict	strategy	transform
partner	protocol	retain	stress	transit
passive	psychology	reveal	structure	transmit
perceive	publication	revenue	style	transport
percent	publish	reverse	submit	trend
period	purchase	revise	subordinate	trigger
persist	pursue	revolution	subsequent	U
perspective	Q	rigid	subsidy	ultimate
phase	qualitative	role	substitute	undergo
phenomenon	quote	route	successor	underlie
philosophy	R	S	sufficient	undertake
physical	radical	scenario	sum	uniform
plus	random	schedule	summary	unify
policy	range	scheme	supplement	unique
portion	ratio	scope	survey	utilize
pose	rational	section	survive	V
positive	react	sector	suspend	valid
potential	recover	secure	sustain	vary
practitioner	refine	seek	symbol	vehicle
precede	regime	select	T	version
precise	region	sequence	tape	via
predict	register	series	target	violate
predominant	regulate	sex	task	virtual
preliminary	reinforce	shift	team	visible
presume	reject	significant	technical	vision
previous	relax	similar	technique	visual
primary	release	simulate	technology	volume
prime	relevant	site	temporary	voluntary
principal	reluctance	so-called	tense	W
principle	rely	sole	terminate	welfare
prior	remove	source	text	whereas
proceed	require	somewhat	theme	whereby
priority	research	specific	theory	widespread
process	reside	specify	thereby	
professional	resolve	sphere	thesis	
prohibit	resource	stable	topic	

Science Essential Academic High School Vocabulary

Biology

allele
 analogous
 ATP
 behavior (innate, learned)
 biogeochemical cycle
 biomolecules
 carrying capacity
 cellular respiration
 DNA (replication, sequence, molecule)
 enzyme
 evolution
 genes (encoding, expression, mutation)
 genotype
 heterozygous
 homologous
 homozygous
 levels of organization (cell, tissue, organs, organ system, organism)
 limiting factors
 multicellular
 mutation
 nucleotide
 pedigree
 permeable
 phenotype
 phospholipids
 population density
 recessive trait
 RNA
 sex-linked trait
 stimulus
 symbiosis (mutualism, commensalism)
 transport (active, passive)
 tropism

Chemistry

atom (electron, proton, neutron)
 atomic mass
 atomic number
 atomic theory
 Avogadro's Number
 balanced equations (mass conservation)
 bonding (ionic, polar covalent, nonpolar)
 catalyst
 chemical equations
 chemical formulas
 electron configuration
 electronegativity
 elements
 endothermic
 entropy
 equilibrium
 exothermic
 gas laws
 intermolecular forces
 inversely proportional
 ion (cation, anion)
 Kinetic Theory
 molar mass
 molarity
 mole
 neutralization
 oxidation
 periodic table (families, periods)
 proportional (directly, indirectly)
 pure substance
 reactant
 reduction
 solubility
 stoichiometry
 valence

Physics

acceleration
 buoyancy
 electromagnetic
 fluid
 force
 gas laws
 gravitation
 inversely proportional
 kinetic energy
 magnitude
 momentum
 Ohm's law (voltage, current, resistance)
 potential energy
 power
 proportional
 scalar
 specific heat
 thermodynamics
 vectors
 velocity
 viscosity
 work

<p><i>Physical Science</i> atom (electron, proton, neutron) atomic mass atomic number catalyst chemical formulas compound conduction conservation (mass, energy, momentum) convection currents dilution elements equilibrium fossil record gas laws geologic time scale heterogeneous homogeneous ion isotopes kinetic energy mixture (heterogeneous, homogeneous, suspension, colloid) nuclear fusion periodic table (families, periods) potential energy pure substance radiation solute solvent star life cycle tectonic cycle thermal energy velocity waves (electromagnetic, seismic, sound)</p>		
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Source: <http://ok.gov/sde/building-academic-vocabulary#English> aligning with CCSS

Expository Short Constructed Responses

Quality Indicators for Grading

Standard Paragraph Form	Explain or Describe	Summarize	Analyze	Persuade or Defend	Evaluate or Justify
<p>A = Address the Prompt Use the verb and/or key noun (or a synonym) from the prompt in you topic sentence or thesis statement.</p>	<p>Student states what they were explaining or describing.</p>	<p>Student states the main idea or topic.</p>	<p>Student conveys what is being compared or can identify the causes and effects or state what the analysis will include.</p>	<p>Students state the issue or what was controversial with clarity in the thesis.</p>	<p>Students state what the justification or evaluation topic is about with clarity.</p>
<p>B = Back it Up Cite evidence, use data, use quotes use big ideas and details, use research, or examples.</p>	<ul style="list-style-type: none"> • Student includes the important steps or details. • Students convey enough explanation or description so that an audience could understand or be able to picture what was explained or described. 	<p>Student includes the most important information or supporting details about this topic.</p>	<p>Students describe important evidence, facts, comparisons, data, research, causes or effects.</p>	<ul style="list-style-type: none"> • Students express a viewpoint and support the evidence presented with quotes, research, data, or other sources. • In defense based SCRs (not persuasive) students also state why the other point of view is wrong using evidence. 	<ul style="list-style-type: none"> • Students state examples to show clear thinking. • Students describe where they got their thinking to show accuracy of assumptions. • Students thinking match the prompt and criteria are relevant to the issue or topic. • Students show logical connections a clear sequence or the parts and big idea match.
<p>C = Conclude your Thinking Restate your premise or conclusion and indicate importance or impact, report what you proved, end with what the author said last, a question you are left with or a possible solution to a problem.</p>	<p>Students convey the purpose, a tip or final observation, or importance of the explanation or description.</p>	<p>Students conclude using one of the following:</p> <ul style="list-style-type: none"> • Connect the main idea and supporting details • Restate the authors' conclusion in their own words • End with a great quote from the author and why the quote is important • Add an important idea to the topic stated in the first sentence. 	<p>Students draw an evidence-based conclusion.</p>	<p>Students use the evidence to convince the intended audience that his/her viewpoint was valid.</p>	<p>Students draw a valid, reasonable and/or logical conclusion for the justification or point of view in the evaluation or justification.</p>

Complex Analysis of Scientific, Mathematical, or Other Numerical Data – Secondary Level Graphic Organizer

What are you describing?

What does your data look like in graph form visually?

What measures of central tendency such as mean, median or mode are relevant or present?

What measures of discrepancy such as range, variance or standard deviation do you note?

Cite your major conclusions in terms of answering the question posed by the data or the hypothesis.

Now write your completed analysis from the answers to the questions above. Use the first question as your introduction and the last as your conclusion.

Analysis of Scientific, Mathematical, or Other Numerical Data

What are you describing?

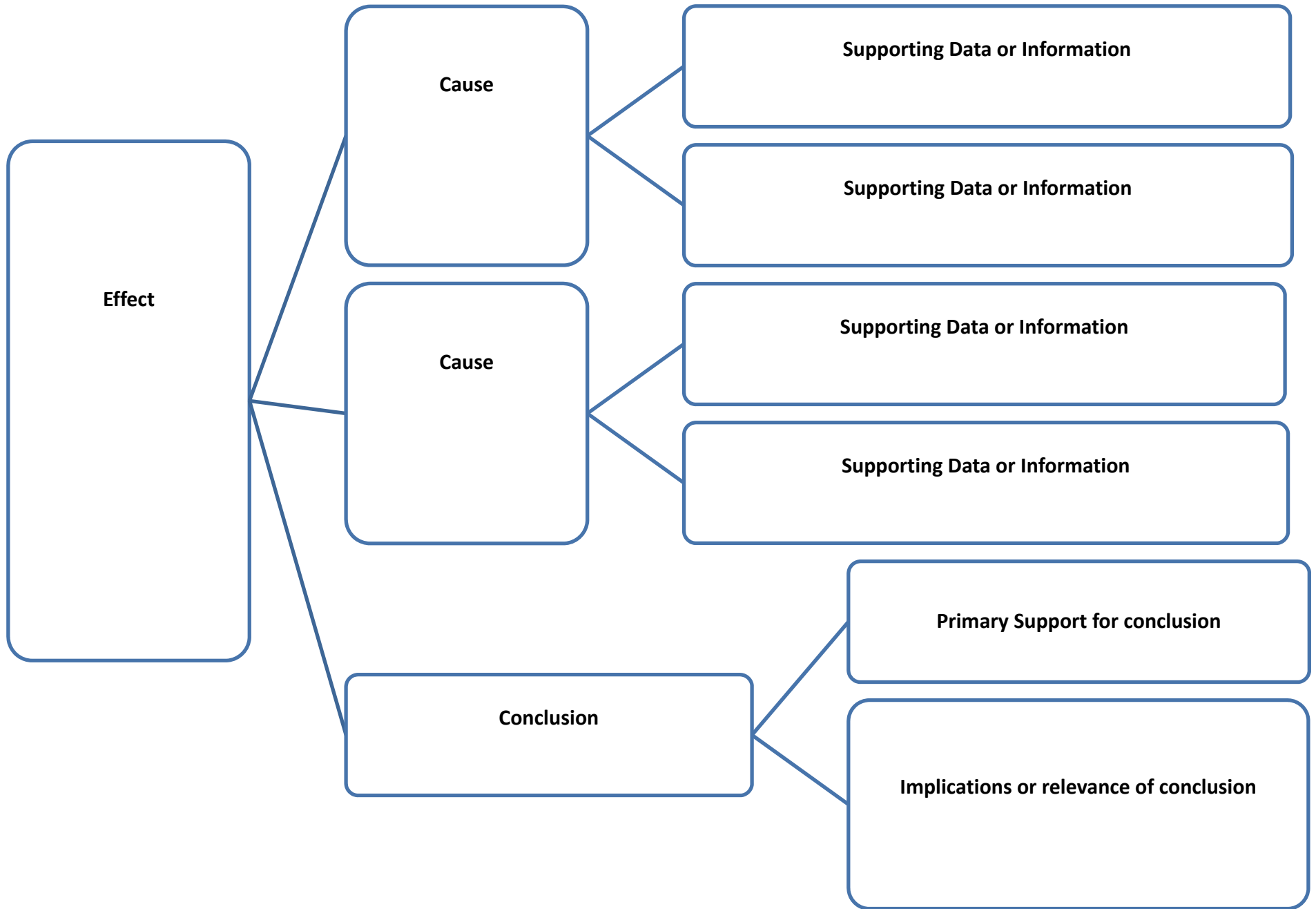
What does your data look like in graph form visually?

What trends do the data show and what visual relationships can you see?

Cite your major conclusions in terms of answering the question posed by the data or the results.

Now write your completed analysis from the answers to the questions above. Use the first question as your introduction and the last as your conclusion.

Cause and Effect Writing



Protein Synthesis**READ RETRIEVE CONNECT & USE****Next Generation Sunshine State Standard**

SC.912.L.16.5: Explain the basic processes of transcription and translation, and how they result in the expression of genes.

Common Core Scientific Literacy Standard

Analyze the structure of the relationships among the concepts in a text, including the relationship among key terms.

Lift Weights, Eat Mustard, Build Muscles?

ScienceDaily (Sep. 29, 2011) — If you are looking to lean out, add muscle mass, and get ripped, a new research report published in *The FASEB Journal* suggests that you might want to look to your garden for a little help. That's because scientists have found that when a specific plant steroid was given orally to rats, it triggered a response similar to anabolic steroids, with minimal side effects. In addition, the research found that the stimulatory effect of homobrassinolide (a type of brassinosteroid found in plants such as mustards) on protein synthesis in muscle cells led to increases in lean body mass, muscle mass and physical performance.

"We hope that one day brassinosteroids may provide an effective, natural, and safe alternative for age- and disease-associated muscle loss, or be used to improve endurance and physical performance," said Slavko Komarnytsky, Ph.D., a researcher involved in the work from the Plants for Human Health Institute, FBNS at North Carolina State University in Kannapolis, N.C. "Because some plants we eat contain these compounds, like mustards, in the future we may be able to breed or engineer these plants for higher brassinosteroid content, thus producing functional foods that can treat or prevent diseases and increase physical performance."

To make this discovery, Komarnytsky and colleagues exposed rat skeletal muscle cells to different amounts of homobrassinolide and measured protein synthesis in cell culture. The result was increased protein synthesis and decreased protein degradation in these cells. Healthy rats then received oral administration of homobrassinolide daily for 24 days. Changes in body weight, food consumption, and body composition were measured. Rats receiving homobrassinolide gained more weight and slightly increased their food intake. Body composition was measured using dual-emission X-ray absorptiometry analysis and showed increased lean body mass in treated animals over those who were not treated. This study was repeated in rats fed high protein diet and similar results were observed. Additionally, researchers used surgically castrated peri-pubertal rat models to examine the ability of homobrassinolide to restore androgen-dependent tissues after androgen deprivation following castration. Results showed increased grip strength and an increase in the number and size of muscle fibers crucial for increased physical performance.

"The temptation is to see this discovery as another quick fix to help you go from fat to fit," said Gerald Weissmann, M.D., Editor-in-Chief of *The FASEB Journal*, "and to a very small degree, this may be true. In reality, however, this study identifies an important drug target for a wide range of conditions that cause muscle wasting."

D. Esposito, S. Komarnytsky, S. Shapses, I. Raskin. **Anabolic effect of plant brassinosteroid.** *The FASEB Journal*, 2011; 25 (10): 3708
DOI: [10.1096/fj.11-181271](https://doi.org/10.1096/fj.11-181271)

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NAME: _____ DATE: _____ PER: _____

BIOLOGY

1. Read the article, "Lift weights, eat mustard, build muscles?" After reading the article (5-10 minutes), write down everything you can remember in the box below. The process of recalling the information is important, so do not return to the article at this point.

2. Return to the article if necessary and answer the following questions. You may also need to draw from your knowledge of biology and you should feel free to use your text or other resource.

a) What are the two main steps of protein synthesis and where in the cell do they take place?

b) What is the role of amino acids in translation?

c) Explain the relationship of transcription and translation to gene expression.

d) Based on the article, what were the independent and dependent variables in the study?

Lin Kuzmich is an educational consultant, university instructor, 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 as a building principal for nine years. Her school was named a 2000 winner of the John R. Irwin Award for Academic Excellence and Improvement. In addition, for the past decade, Lin was involved in staff development through several universities and the Tointon Institute for Educational Change. She served as an Instructor at Colorado State University in the Principal Preparation Program and as Senior Consultant for the International Center for Leadership in Education. Lin also provides training and coaching to school districts around the country and presents at numerous national and international conferences.

Lin's additional experience includes Assistant Director of Special Education (1988-1991); Vision Specialist and Reading Teacher for Thompson School District (1979-1988); 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. She has worked extensively with districts trying to understand the new Common Core State Standards, update curriculum, and create appropriate assessment and instruction to address the increased rigor. Her latest publication specifically addresses methods of planning and instruction with the new standards. Lin's work with schools improves achievement results for students and increases the capacity of staff, and she is passionate about helping educators prepare today's students for a successful future.

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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
- "Instructional Leadership and Results-based Supervision" in SPN Network Monthly (2010) Successful Practices Network, NY.
- 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)
- Applied Differentiation: Making It work in the Classroom (2006) School Improvement Network, Linton Productions, Inc. co-authored with Gayle Gregory and Cindy Strickland (Multi-Media Kit and PD Package)
- "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)
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- Data Driven Differentiation in the Standards Based Classroom, (2004) Corwin Press, co-author Gayle Gregory. (Bestseller)
- "Taking Professional Care of New Teachers," CSDC Network News, October 2001.
- Data Driven Instruction, (1998) Colorado: CBOCES.
- Facilitating Teacher Evaluation in a Standards-Based Classroom, (1996) Colorado: CBOCES, Co-authored with R. Zila, L. Gleckler and P. Denzin.
- "Neurophysiological Development: A Review for Educators," The Journal of Professional Studies, Vol. 5 No. 1, Feb. 1980.