Persuasive Writing Continuum Grades K-12 – Writing in Science to Support Claims With Evidence
Write to Argue

Please Note: This continuum was developed from the Common Core State Standards. In some places there is a blending of the Common Core Standards with the vision set forth in A Framework for K-12 Science Education. Specifically the language "claims" and "evidence" reflects the integral role of argumentation within the "Practices of Science" explicated in Dimension One of the Framework. The ability to articulate and communicate a scientific "claim" supported with "evidence" is central to the work of the discipline.

K-2	3-5	6-8	9-12
I stated a "claim". I supported my "claim" with "evidence" from my science journal, talks with other scientists in my class, and from the books I read. I used words like (e.g. *because* and *also*) when connecting my claims with evidence. Please note CCSS uses the terms *opinion* and *detail.* "Claim" and "Evidence" were supplemented to represent the thinking process explicated in **The Nature of Science.** With guidance young children can use this language operatively.	I stated a "claim" and supported my "claim" with "evidence". a. I stated my "claim". b. I created an organized way of sharing my "claim" and "evidence" with my reader. c. I provided "evidence" from my data, conversations with other scientists, and my research. d. I linked my ideas together with words. (e.g. *consequently, generally, specifically)* e. I kept my reader interested and used persuasive language in my writing. f. I organized my thinking in a concluding sentence that restates my main idea. Please note CCSS uses the terms *opinion* and *detail.* "Claim" and "Evidence" were supplemented to represent the thinking process explicated in **The Nature of Science.**	I wrote an argument focused on science content. a. I introduced a claim about a topic or issue. b. I distinguished my claim from alternate or opposing claims. c. I organized reasons, data, and evidence logically to support my claim. d. I supported the claim with logical reasoning and detailed, accurate data and evidence. e. I used words and phrases as well as science vocabulary to make clear the relationships among claims, reasons, data, and evidence. f. I used an objective style and tone throughout my writing. g. I concluded my writing with a statement that follows logically from my argument.	I wrote an argument focused on science content. a. I introduced a claim about a topic or issue. b. I distinguished my claim from alternate or opposing claims. c. I organized reasons, data, and evidence logically to support the claim. d. I developed my claim thoroughly supplying the most relevant data and evidence acquired in a scientifically acceptable form. e. I used scientific vocabulary and precise words to clarify the relationships between claims and evidence. f. I maintained an objective style and tone throughout my writing. g. I concluded my writing with a statement that follows logically from my argument.

Expository Writing Continuum Grades K-12 – Writing to Inform in Science (Student Language K-12)

This Continuum is based upon the Common Core Standards for English Language Arts and Literacy in Science & The Technical Subjects

K-2	3-5	6-8	9-12
Write to Inform: I introduced my topic. I used facts and definitions to tell my reader more. I organized my writing under "big ideas". I ended with a sentence that brings my ideas together. I added information to a shared writing project using information from several books and my own experiences.	Write to Inform: a. I stated the topic clearly. b. I grouped related information in paragraphs or sections. c. I told more about the topic using facts, details, quotations and other information. d. I used linking words so my reader could easily understand the information I described. e. My conclusion was clear. It synthesized all of my ideas. Gather Information: • I gathered information from experience, print, and digital resources. • I summarized notes from multiple resources. • I provided basic bibliographic information.	Write to Inform or Explain: a. I provided an interesting introduction to my topic. b. I organized information under categories "big ideas". c. I used relevant facts, data, details and quotations to help my readers under each category/big idea. d. I used connecting vocabulary and clear sentence structure to create text that my reader could easily follow. e. I used scientific vocabulary accurately throughout my writing. f. I wrote objectively in a style that helps a reader seeking information. g. I wrote a conclusion that was clearly connected to the information. My conclusion synthesizes the information for my reader. Gather Information: • I cited information effectively in a digital format. • I used multiple print and digital resources to gather information. • I carefully assessed the credibility and accuracy of each source before I used it. • I made certain that I quoted	Write to Inform or Explain: a. I provided an interesting introduction to a complex topic. b. I organized the information so that each new piece of information built upon the piece that came before it to create a unified whole. c. I used formatting and graphics (e.g. headings, figures, tables, graphs and illustrations) to help my reader comprehend my writing. d. I developed a complex topic that is scientifically significant. e. I used data, quotations, and information from other individuals who have written about this topic. f. I used transitional words and phrases to help my reader understanding how the sections of my writing are connected. g. I used transitional words and phrases to link the different sections in my writing. h. My conclusion brings all the information together. It is a logical synthesis of the information.

		or paraphrased evidence, giving credit to the original source. • I respected the original author by avoiding plagiarism. • I followed an approved format for citation.	Gather Information: • I cited information effectively in a digital format. • I used multiple print and digital resources to gather information. • I carefully assessed the credibility and accuracy of each source before I used it. • I integrated information from a variety of sources. • I avoided depending on one source as my major source of information. • I respected the original author. • I followed an approved format for citation.

Graphing Scientific Data - Continuum Grades K-12

K-2	3-5	6-8	9-12
I put a title on my graph. I labeled the parts of my graph. I put the data in the right place on the graph. I made sure the data on my graph matched our classroom tally. I read my graph. I told what my graph was about. I wrote a caption under my graph that tells the story of my graph.	I gave my graph a title that communicates what the data shows. I labeled all the parts of my graph. I made sure I included scientific units of measure. I put the data in the correct place on my graph. I made sure that the data on my graph matched my data table. I wrote a story/description that provides details about my graph.	I chose the appropriate type of graph to represent my data. The title of my graph clearly relates to the information displayed on the graph. I used a straight edge or compass to create a neat graph. I chose appropriate intervals to number the x and y-axes. I spaced my numbers evenly on the graph. I labeled all parts of my graph correctly: Units of measurement, x and y-axes, columns, rows.	I chose the appropriate type of graph to display the data. The title of my graph clearly identifies the data displayed on the graph. I analyzed the range of data to choose the appropriate intervals and sequencing of numbers for the x and y-axes. The physical intervals on my graph are scaled appropriately and spaced evenly. I labeled all parts of my graph correctly: Units of measurement, x and y-axes, columns, rows.

		I placed the manipulated/independent variable on the x-axis and the responding/dependent variable on the y-axis. I created a key for the graph. I accurately plotted the data set. I determined trends/patterns in the data. I identified outliers in my data. I provided a detailed description and explanation of the data including inferred trends and patterns.	I plotted my data set accurately. I choose the appropriate line or curve to fit the data. I described and explained the meaning of the graph. I labeled the independent variable on the x-axis and the dependent variable on the y-axis. I calculated and interpreted the slope, y and x intercepts.
Data Representations: • Pictures • Tally • Table • Bar graph	Data Representations: • Picture • Tally • Table • Bar graph • Line plot graph • Stem-and-leaf graph	Data Representations: • Table • Bar graph • Histogram • Line plot graph • Stem-and-leaf graph • Circle graph • Frequency distribution	Data Representations: • Table • Bar graph • Histogram • Line plot graph • Stem-and-leaf graph • Circle graph • Frequency distribution • Scatter plots • Box-plots

Narrative Writing Continuum - Grades K-12

This Continuum is based upon the Common Core Standards for English Language Arts and Literacy in History/Social Studies & Science

K-2	3-5	6-8	9-12
I wrote a narrative telling how I did a "fair test". I wrote a narrative telling how I came up with a design, tested it and then made changes.	I wrote a narrative that engages my reader and accurately describes a "fair test" or "technological design" process I completed. a. I engaged my reader by introducing the "fair test" or "design problem" I solved. b. I used narrative techniques to describe my thinking and my actions. c. I used words that help my reader follow the sequence of steps I followed. d. My conclusion sums up the process and asks a new question. (e.g. After discovering….now I'm wondering…..) e. I revised and published my writing based upon the feedback I received from adults and peer editors.	I wrote a narrative that clearly describes the steps I took to carry out a scientific investigation or to solve a technological design problem. a. I engaged my reader by introducing the scientific investigation or design problem I set out to solve. b. I used narrative techniques to tell my reader why this was important to me citing research, observations and previous investigations. c. I used transitional words to help my reader follow the sequence of steps I followed. d. My steps can be easily replicated. e. I described my findings using evidence from the data I collected. f. My conclusion sums up what I found out. I shared the new questions I am thinking about based upon my findings. g. I revised and published my writing based upon the feedback I received from adults and peer editors.	I wrote a narrative that clearly describes the steps I took to carry out a scientific investigation or to solve a technological design process. a. I engaged my reader by introducing the scientific investigation or design problem I set out to solve. b. I used narrative techniques to tell my reader why this was important to me citing research, observations and previous investigations. c. I used transitional words to help my reader follow the sequence of steps I followed. d. I clearly described my steps/process so they can be easily replicated. e. I described my findings in detail citing evidence from the data I collected. f. My conclusion sums up what I found out. I developed and shared the new questions I am thinking about based upon my findings. g. I invited others to look critically at both my writing and my process of

			investigation or design. h. I revised and published my writing based upon the feedback I received from adults and peer editors. <u>Sophisticated Narratives in Science</u> I told a story, from the perspective of a scientist, of a discovery, invention, or a story of persistence without success. My narrative is based upon significant research including primary documents. (e.g. journal entries) My narrative incorporates key conceptual findings of the scientist. I described scientific concepts and used scientific vocabulary correctly throughout my narrative.

Informational Text
Teaching Students to Work Effectively With Informational Text
Background for the Science Teacher

Teacher Note: Challenge students to determine the purpose of the informational text they are reading. Informational text is written with a variety of structures. Author's intent can easily be clarified by identifying core vocabulary words that make the author's intent transparent. Is the author's intent to explicate cause/effect, comparison/contrast, problem/solution/ question/answer, or sequence?

Our challenge, as science teachers, is to support students in recognizing patterns in informational text and to further challenge our students to apply those patterns in their own writing. The core vocabulary words associated with structures of informational text writing will be helpful in scaffolding our teaching process.

TEXT CUES

Cause/Effect	Comparison/Contrast	Problem/Solution	Question/Answer	Sequence
Since	In like manner	One reason for	How	Until
Because	Likewise	that……	When	Before
Accordingly	Similarly	A solution	What	Initially
As a result of	The difference	A problem	Where	After
This lead to	between		Why	Afterward
On account of……	As opposed to		Who	As soon as
Due to	Although		How many	During
May be due to……	As well as		The best estimate	Next
For this reason…..	After all		It could be that	Finally
Consequently	However		One may	Lastly
Is caused by…..	And yet		conclude……	First/last
Leads/lead to	But			Then
If/then	Nevertheless			On (date)
Then, so	Instead of			At (time)

Therefore	Following
Thus	Later
When…..then	Meanwhile
In common	Steps involved
On the other hand	When…then…
Similar to	

Lists from *Strategies That Work* (Harvey & Goudvis, 2000)

Scientific Drawing – Continuum Grades K-12

K-2	3-5	6-8	9-12
I drew what I saw. I labeled all the parts of the drawing. I gave the drawing a title. I made the drawing clear enough to see all the parts. My drawing is neat and easy to follow. I used my science words to label my drawing.	My drawing looks similar to what I observed. I included as many details as possible: color, textures, shapes, measurements, etc., I labeled all the parts of my scientific drawing. My drawing is neat and easy to follow. I wrote a title that tells what my scientific drawing shows. I wrote an explanation of what my scientific drawing is trying to show. I used my science vocabulary in my explanation. My scientific drawing is large enough for details to be recognized.	My drawing is realistic. It depicts the object observed. I have included many details: size (with metric measurements), colors, textures, shapes, and relationships to surroundings. My title is descriptive and accurate. My drawing is neat and can be easily read. I clearly and accurately labeled all the parts of my drawing. I have drawn multiple perspectives to provide the viewer with a complete picture of the object under study. I included a detailed explanation of what the scientific drawing is intended to show. I used scientific vocabulary throughout my explanation. My scientific drawing is of an appropriate size and scale for details	My drawing is detailed and includes both quantitative and qualitative observations. My drawing includes only the features I actually observed and not features I inferred. My title is descriptive and accurate. All parts of my drawing are clearly and accurately drawn and labeled. I drew multiple perspectives to provide the viewer with a complete picture of the object under study. I included a detailed explanation of what the scientific drawing is intended to show. I used scientific vocabulary throughout my explanation. I used a very precise scale and proportions consistently throughout my drawing. I accurately described my metric

		to be recognized, or magnification is indicated.	scale.