Science Language Functions Resource

A. Scientists ask questions about objects, organisms, systems, and events in the natural world.		
Language Function	Form and Structure	Sentence Frame
Ask • Inquire	Solicit information (*yes or no questions; who, what, where, why and how; statements used as questions*)	I wonder why _____. What happens when _____? What if _____? What does _____? What can _____? What would happen if ____? How does _____ affect ____? How can I find out if _____? Which ____?
B. Scientists plan and conduct investigations.		
Language Function	Form and Structure	Sentence Frame
Predict	Express an idea or notion about a future action or event based on available information. Adverbials such as *maybe, perhaps, obviously, evidently, generally, typically.*	I think _____ will happen because _____. I predict _____ will _____. If _____, then _____ because _____. When I change _____ I think _____ will happen because ___
Plan • Design • Sequence • Organize • Strategize • Estimate	Plan controlled experiments with multiple trials. (*independent variable, dependent variable)* Describe the sequence of events and the materials used to conduct an investigation or event. Adverbials such as *first, second, next, then, finally.*	I will change _____. I will not change _____. I will measure _____. I will observe _____. I will record the data ____. I will _____ to learn more about _____. First I will _____ and then I will _____. I will need _____ to _____.
Conduct • Explore • Investigate		I used the new materials to _. I will find out _____ by _____. I will ____ to learn more about. I wonder what would happen if _____. I am curious about _____. It surprised me that _____, because _____.

H2b

C. Scientists use tools and techniques to record data and extend the senses.

Language Function	Form and Structure	Sentence Frame
Observe • Describe • Draw • Measure • Record • Estimate • Sequence	Words, phrases, sentences, drawings, or symbols used to describe the attributes or properties of an object or phenomena using the senses.	I observe _____. I notice _____. I see _____. I feel _____. I hear _____. I taste _____. The _____ has _____. The _____ feels _____. When I _____, it _____. At first _____. After _____. It reminds me of _____, because_____. The _____ is _____ cm long. The _____ weighs _____. Looking at _____, I think there are _____. My best guess is _____. First I saw _____, then _____, and finally _____.
Compare	Express similarities and/or differences, or to distinguish between two or more objects, actions, events, or ideas. Coordinating conjunctions *(and, but, yet, or)* and adverbials *(similarly, likewise, in contrast, instead, however, whereas, despite this.)*	This _____ is the same as _____ because _____. This _____ is different than _____ because _____. _____ and _____ are similar because. _____ and _____ are different because.
Classify • Identify • Label • Enumerate	Assign/associate an object, action, event, or idea to the category or type to which it belongs.	All of these are _____ because _____. This _____ is _____ because _____. _____, _____, and _____ all have/are _____. There are _____ types of _____.

H2c

D. Scientists organize observations (data) using numbers, words, images, and graphics.

Language Function	Form and Structure	Sentence Frame
Organize • List • Illustrate	Express relationships between/among objects, actions, events, or ideas, or the structure or arrangement of information. Coordinating conjunctions such as *and, but, yet, or* and adverbials such as *first, next, then, finally.*	I organized the data by _____. All of the _____ are in this group because _____. All of these are _____. We put _____, _____, _____, and ____ in _____.
	Use of graphic organizers such as T-charts, Venn Diagrams, charts, tables, concept maps, lists, labeled diagrams, schematic drawings, etc.	The label says _____. This graph/table/picture shows _____.

E. Scientists use data, analysis, and logic to construct and communicate reasonable explanations.

Language Function	Form and Structure	Sentence Frame and other Scaffolds
Define	Express the meaning of a given word, phrase, or expression.	In science, the word _____ means _____.
Analyze	Indicate parts of a whole and/or the relationship between/among parts of an action, event, idea, or process. Relationship verbs such as *contain, entail, consist of.* Data is expressed in **qualitative** terms such as *more/fewer; higher/lower nearer/farther; longer/shorter increase/decrease*; and **quantitatively** in actual numbers or percentages.	As _____, then _____. When I changed _____, then _____ happened. The more/less _____, the _____.
Summarize	Express important facts or ideas and relevant details about one or more objects, actions, events, ideas, or	The main idea is _____. The most important parts are _____.

	processes. Structures include beginning with an introductory sentence that specifies purpose or topic.	H2d
Infer • Conclude • Interpret • Explain	Express understanding of implied/implicit meaning based on available information. Inferential logical connectors such as *although, while, thus, therefore.*	Since _____, I think _____. I figured out _____ based on _____. I claim _____. My evidence is _____. I know that _____; I know this because _____. My evidence supports my prediction because _____. In conclusion, _____.
Interpret	Phrases, sentences, or symbols to express understanding of the intended or alternative meaning of information.	I think _____ happened because _____. I think _____ means that _____ because _____. I learned that _____.
Explain	Express rationale, reasons, causes, or relationships related to one or more action, events, ideas, or process. Coordinating conjunctions *so, for* and adverbials such as *therefore, as a result, for that reason.*	When I _____, I found out _____. The _____ is _____ because _____. I think _____ happened because _____.
Generalize	Express an opinion, principle, trend, or conclusion that is based on data and/or to extend that opinion to other relevant situations or contexts.	My data shows _____; therefore, I think _____.
F. Scientists discuss and justify the merits of explanations.		
Argue	Present a point of view with the intent of communicating or supporting a particular position or conviction. Expressions such as *in my opinion, it seems to me,* and adverbials such as *since, because, although, however.*	I think _____ because_____. I agree/disagree with _____ because_____.

		H2e
Persuade • suggest	Present ideas, opinions, and/or principles with the intent of creating agreement around or convincing others of a position or conviction. Expressions such as *in my opinion, it seems to me* and adverbials such as *since, because, although, however.*	I think you should try _____. What worked for me is _____.
Negotiate • Discuss	Engage in a discussion with the purpose of creating mutual agreement from two or more different points of view.	Tell me what you observed. What you are saying is _____. What do you think about _____? I agree with _____ that _____. What if _____? Have you thought about _____?
Synthesize	Express, describe, or explain relationships among two or more ideas.	
Critique • Reflect	Express a focused review or analysis of an object, action, event, idea, or text.	I have changed my thinking about _____. I used to think _____, but now I think _____. I still have questions about _____. I was reminded of _____. I'm confused about _____. I wonder if _____.
Evaluate	Express a judgment about the meaning, importance, or significance of an action, event, idea, or text.	This information could be important because _____.

References:

Dobb, F. 2004. *Essential Elements of Effective Science Instruction for English Learners*. 2nd ed. Los Angeles: California Science Project.

Fulwiler, B. 2007. *Writing in Science: How to Scaffold Instruction to Support Learning*. Portsmouth, NH: Heinemann.

Klentschy, M. 2008a. *Science Notebook Component Chart*

WestEd. 2008. *Language Demands-Academic English Language Functions.*