



Science Community of Practice Shared Resources for Writing Explanations

Please share resources that you have created/used/accessed that support students with sensemaking and writing explanations. Resources such as writing organizers, rubrics, supports for multilingual learners or differently abled students, etc. To help others see the context of how the resource is used, please provide a short description and intended grade level(s).

Type of resource	Description of use & grade(s)	Link to resource
Graphic organizer	Used with high school students to explain the cause of an effect that is NOT in doubt. Ss should start by writing the effect, then describe the mechanism and the cause of it.	www.bozemanscience.com/s/Cause-Effect.pdf
Noticing Sensemaking Modeling CCC Framework	Used for all grades to integrate the crosscutting concepts in sensemaking discussions as well as writing.	https://findsciencetalent.files.wordpress.com/2020/12/noticing-sensemaking-modeling-framework-1.jpg
CER templates and more MLL	This website provides resources from scaffolds for talk to scaffolds for writing. These scaffolds support all students including MLL and differently abled.	https://ambitioussciencelearning.org/tools-scaffolding/
Organizers Must Haves for assessment	Considerations for assessing three-dimensional performance: science and engineering practices, such as constructing explanations.	https://www.nextgenscience.org/sites/default/files/TAPS%20SEPs.pdf
Article from NSTA	In this article, we examine the sixth and seventh practices concerning explanation and argumentation, respectively. The two practices depend on each other: For students to practice explanation construction, they must also engage in argumentation.	https://static.nsta.org/ngss/resources/201204_Framework-ReiserBerlandKenyon.pdf
Book for K-5	What's your evidence? Engaging K-5 students in Constructing Explanations in Science.	http://www.amazon.com/Whats-Your-Evidence-Constructing-Explanations/dp/0132117266/ref=sr_1_3?ie=UTF8&qid=1321998661&sr=8-3
Book for 5-8	Supporting Grade 5-8 Students in Constructing Explanations in Science: The Claim, Evidence and Reasoning Framework for Talk and Writing.	http://www.amazon.com/Supporting-Students-Constructing-Explanations-Science/dp/0137043457/ref=sr_1_1?s=gateway&ie=UTF8&qid=1285635537&sr=8-1
List of Instructional Strategies	Provides 12 ideas for strategies to use with students to think through their ideas and form explanations.	https://htmlsimulations.s3.us-west-1.amazonaws.com/Handout-Instructional-Strategies-for-Writing-and-Drawing.pdf

Website	Collection of resources for teaching students the practice of scientific argumentation	http://www.argumentationtoolkit.org/
Guided See-Think-Wonder	See-Think-Wonder with sentence starters to provide support for 9th graders in biology to formulate a written argument.	Evolutionary relationships see-think-wonder
CER graphic organizer macromolecules	To prepare students for a phenomena driven summative assessment (link here Credit for question: HHMI lactose intolerance storyline, NGSS life science macromolecules) I created a scaffolded CER graphic organizer to have students practice using evidence to explain their reasoning when identifying macromolecules. Reasoning was used for students to explain why they did not select another answer.	CER graphic organizer macromolecules
KWI problem solving tool	To help students develop a problem solving toolkit I use a KWI graphic organizer for students to correct quiz/test answers. Students write down the information that is given in the question (what do you KNOW?), re-write the question in their own answer (What do you WANT to know?), then they write down key vocabulary, concepts, examples (What INFORMATION do you have). Then I have students re-write their answer. The requirement is to include everything they listed in the KWI chart.	KWI problem solving tool
CER sample rubric	This is a middle school rubric I have used and modified as needed.	CER rubric
Teacher Pedagogy	Tool to help teachers engage students K-5 in communicating verbally and transfer to writing	Communication Session
Student Resource	Sentence framed used for student communication verbally and in writing K-8	Science Sentence Stems
Input-Output model (variation on cause and effect graphic organizer) Pg 2	Graphic organizer similar to cause and effect relationships.	Input-Output model (variation on cause and effect graphic organizer) Pg 2
Writing in Science Grades 6-8 Teacher Tool	Strategic Pedagogy for teacher instruction on writing in science grade 6-8	Writing in Science Grades 6-8 Teacher Tool
Graphic Organizer	CER organizer from Colorin Colorado	CER Graphic Organizer for MLLs

Sample CER Organizer:

CER Student Graphic Organizer

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graph TD; Q[Question] --> C[Claim]; C --> R1[Reasoning]; C --> R2[Reasoning]; C --> R3[Reasoning]; R1 --> E1[Evidence]; R2 --> E2[Evidence]; R3 --> E3[Evidence];
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Question:

Claim: What is your answer to the question? It should be more than a "yes" or "no".

Reasoning: How does evidence support your claim? What is the science principle that explains why evidence is linked to the claim?

Evidence: What is a specific observation or data from the lab that supports your claim?

Sample CER sentence stems:

