

Contents

Claims, Evidence, Reasoning, Rebuttal.	2
Learning Outcomes:	2
CER in Science Instruction	3
Learning Outcomes:	3
Claim, Evidence Reasoning – Where does it begin?	3
Next Generation Science Standards.	3
Three Dimensions of Learning	4
Science and Engineering Processes.	4
The 5E Lesson Framework	5
Deep Dive Into CER.	7
Learning Outcomes:	7
Landscape of Learning	7
Planning for CER	11
Learning Outcomes:	11
Battle of the Rebuttals	11
Closing.	13
Learning Outcomes:	13
2-2-2 Plan	13



Use this Participant Guide to process your learning and thinking as you dive deeper into *Student-Centered Science*. We thank you for your dedication to students and making the classroom an even more positive, productive, and motivating place to learn.

Build a CER - Example

I think the claim is _____ because _____.
_____ (data/evidence) supports the claim because _____.
I don't think that _____ because _____.
_____ (data) and _____ (part of the claim) are part of the
reasoning because _____

CER Sentence Stems:

I think the claim is _____ because _____.
_____ (data/evidence) supports the claim because _____.
I don't think that _____ because _____.
_____ (data) and _____ (part of the claim) are part of the
reasoning because _____

Claim Sentence Stem:

I kept my original claim statement because _____.
I revised my claim statement to _____ because _____.

Reasoning Sentence Stem:

The reasoning for my claim is _____. It's connected to the scientific
principle(s) of _____.

Rebuttal

Rebuttal for CER

Science and Engineering Processes

Asking Questions and Defining Problems

Developing and Using Models

Planning and Carrying Out Investigations

Analyzing and Interpreting Data

Using Mathematics and Computational Thinking

Constructing Explanations and Designing Solutions

Engaging in Argument from Evidence

Obtaining, Evaluating, and Communicating
Information

Standards for Mathematical Practices

Overarching Habits of Mind

1 Make sense of problems and persevere in solving them.

6 Attend to precision.

Reasoning and Explaining

- 2 Reason abstractly and quantitatively.
- 3 Construct viable arguments and critique the reasoning of others.

Modeling and Using Tools

- 4 Model with mathematics.
- 5 Use appropriate tools strategically.

Seeing Structure and Generalizing

- 7 Look for and make use of structure.
- 8 Look for and express regularity in repeated reasoning.

English / Language Arts Strands

Reading

Key ideas and details
Craft and structure
Integration of
knowledge and ideas
Range of reading and
level of text complexity

Speaking and Listening

Comprehension and
collaboration
Presentation of
knowledge and ideas

Writing

Text types and purpose
Production and distribution of
writing
Research to build and present
knowledge
Range of writing

Language

Conventions of standard English
Knowledge of language
Vocabulary acquisition and
use

CER in Science, Math and ELA

