Unit 2 Phet CER: Rubric- 2024

Guiding Questions: What Happens at the Molecular Level When Thermal Energy Is Added to a Substance?

Scientists and engineers must be able to communicate clearly and persuasively the ideas and methods they generate. Critiquing and communicating ideas individually and in groups is a critical professional activity in many arenas. Communicating information, evidence, and ideas can be done in multiple ways, including writing. Today we will answer the guiding question in writing with a C.E.R.

Hallmarks of good scientific writing:

- *Clear and simple: avoids unnecessary words and phrases. Ask yourself, "How does this statement add to the answer of what I am explaining?"*
- *Impartial: avoids making assumptions (Everyone knows that…) and unproven statements (it can never be proven that…)*
- *Logically structured and grammatically correct: proofread your work for typos, mathematical, and grammatical errors.*
- *Accurate: avoids fluffy or vague language such as about, approximately, almost, and actually.*
- *Objective: avoids personal pronouns (I, you, we, and us) and includes statements and ideas that are supported by evidence.*

Points:	**Claim** A statement or conclusion that answers the original question/problem.	**Evidence** Scientific data that supports the claim. The data needs to be appropriate and sufficient to support the claim.	**Reasoning** Reasoning that connects the evidence to the claim. It shows why the data counts as evidence by using appropriate and sufficient scientific principles.
0	Does not make a claim	Does not provide evidence, or only provides inappropriate evidence or vague evidence, e.g. "the data shows me it is true" or "It would be a lot harder to move a piano without a lever"	Does not provide reasoning, or only provides inappropriate reasoning e.g. "levers are used in lots of ways in our lives".
1-2	makes an inaccurate claim e.g. – "Levers do not affect work."	Does not include specific data e.g. makes a general statement about how in the investigations levers sometimes made the work easier and sometimes did not make the work easier.	Repeats evidence and links it to the claim, but does not include scientific principles.
2-4	Makes an accurate but vague or incomplete claim e.g. – "Levers make work easier." Or "Levers do not make work easier." (It can actually depend).	Provides only one piece of specific data (e.g. numbers) from the investigation.	Provides only one line of justification to support the one piece of evidence.
4-5	Makes an accurate and complete claim e.g. – "Levers used appropriately make work easier."	Provides multiple pieces of specific data to support the claim. Both qualitative and quantitative observations are included.	Provides a complete justification which supports the multiple pieces of evidence.