

Claim-Evidence-Reasoning (C-E-R)

Student Graphic Organizer

★ Question: _____

C

(Claim)

Write a statement that responds to the question.

E

(Evidence)

Provide scientific data to support your claim. Your evidence should be appropriate (relevant) and sufficient (enough to convince someone that your claim is correct). This can be bullet points instead of sentences.

R

(reasoning)

Use scientific principles and knowledge that you have about the topic to explain why your evidence (data) supports your claim. In other words, explain how your data proves your point? (paragraph format)

Claim-Evidence-Reasoning

(C-E-R) Rubric

	0	1	2	3
CLAIM <i>A statement that answers the original question/problem.</i>	Does not make a claim, or makes an inaccurate claim.	Makes an accurate but incomplete or vague claim.	Makes an accurate and complete claim.	X
EVIDENCE <i>Scientific data that supports the claim. Data needs to be <u>appropriate</u> and <u>sufficient</u> to support the claim.</i>	Does not provide evidence, or only provides inappropriate evidence (evidence that does not support claim).	Provides appropriate but insufficient evidence to support claim. May include some inappropriate evidence.	Provides appropriate and sufficient evidence to support claim.	X
REASONING <i>Explain why your evidence supports your claim. This must include scientific principles/knowledge that you have about the topic to show why the data counts as evidence.</i>	Does not provide reasoning or provides reasoning that does not link evidence to claim using scientific principles.	Provides reasoning that links claim to evidence, but does not include scientific principles.	Provides reasoning that links the claim and evidence using scientific principles, but not sufficient.	Provides reasoning that links evidence to claim. Includes appropriate and sufficient scientific principles.

Points Earned	Letter Grade
7	A
6	B
5 and lower	P

Total Possible Points: **7**

Total Points Earned: _____

Grade: _____

Need help writing your REASONING?

Follow this path....

Step 1

- Re-state your claim.

Step 2

- Provide some scientific principles/knowledge that you already have about a topic.

Step 3

- Provide data from the activity (lab, gizmo, etc.) that connects to the scientific principles/knowledge you mentioned in Step 2. Show that your data can be used to prove your claim.

Step 4

- Wrap up your reasoning with a conclusion sentence that begins with a word such as "Therefore," "Hence," "Thus," "So," and re-state the claim.

Sample C-E-R: Alien

The following are two samples of Claim-Evidence-Reasoning conclusions that were reviewed in class. The C-E-R examples are based on two commercials and one data table that we used to collect data. Feel free to come back and review these samples whenever you need a refresher on how to do a C-E-R.

Audi Commercial "Alien" http://www.youtube.com/watch?v=89uJz_us4PM

★ **Question:** Is the little girl's dad an alien?

<p style="text-align: center;">C</p> <p style="text-align: center;">(claim)</p> <p>Write a statement that responds to the question.</p>	<p>Her dad is an alien.</p>
<p style="text-align: center;">E</p> <p style="text-align: center;">(evidence)</p> <p>Provide scientific data to support your claim. You should only use appropriate (relevant) data and include enough data to convince someone that your claim is correct. This can be bullet points instead of sentences.</p>	<ul style="list-style-type: none"> • Speaks a weird language • Has a spaceship • From a place with a weird name • Drinks green stuff • Looks funny
<p style="text-align: center;">R</p> <p style="text-align: center;">(reasoning)</p> <p>Explain <u>why</u> your evidence (data) supports your claim. In other words, how does your data prove your point? Your explanation <u>must</u> include scientific principles/knowledge that you have about the topic to prove that your evidence supports your claim.</p>	<p>The little girl's dad is an alien. Aliens drink green stuff and they speak a weird language. They have spaceships to travel in. Aliens also look funny. They come from places that have weird names. They also walk funny.** The little girl's dad drinks green stuff, he has a space ship of his own and he walks weird. He also looks weird, like an alien. Her dad speaks a weird language and finally, he is from a place with a weird name. Therefore, her dad is an alien.</p> <p><i>**Note to students: This of course would be background knowledge that a little girl of her age would have (or assume she has) about aliens, for this example. C-E-Rs otherwise will be based on factual information.</i></p>

Sample C-E-R: Prom

Audi Commercial "Prom" <http://www.youtube.com/watch?v=ANhmS6QLd5Q>

★ **Question:** Did the boy get punched in the face at prom?

<p>C</p> <p>(claim)</p> <p>Write a statement that responds to the question.</p>	<p>The boy was punched in the face at prom.</p>
<p>E</p> <p>(evidence)</p> <p>Provide scientific data to support your claim. You should only use appropriate (relevant) data and include enough data to convince someone that your claim is correct. This can be bullet points instead of sentences.</p>	<ul style="list-style-type: none">• Black eye• Kissed another guy's girlfriend• Prom king yelled and walked up to him really mad
<p>R</p> <p>(reasoning)</p> <p>Explain <u>why</u> your evidence (data) supports your claim. In other words, how does your data prove your point? Your explanation <u>must include scientific principles/knowledge</u> that you have about the topic to prove that your evidence supports your claim.</p>	<p>The boy was punched in the face at prom. When you get hit hard in the face, it bruises (called a black eye). When you kiss someone else's girlfriend, they get mad. When someone is mad enough, they may approach you angrily. The boy kissed the prom king's girlfriend and the prom king got really mad. The boy had a black eye on the way home. Therefore, the boy was punched in the face at the prom.</p> <p><i>**Note to students: This of course is a silly sample we used in class to practice C-E-R writing and is based on a lot of speculation (what we think happened). C-E-Rs will otherwise will be based on factual information.</i></p>

Sample C-E-R: Identifying Liquids

Examine the following data table:

	Density	Color	Mass	Melting Point
Liquid 1	0.93 g/cm ³	no color	38 g	-98 °C
Liquid 2	0.79 g/cm ³	no color	38 g	26 °C
Liquid 3	13.6 g/cm ³	silver	21 g	-39 °C
Liquid 4	0.93 g/cm ³	no color	16 g	-98 °C

★ **Question:** Are any of the liquids in the data table the same substance?

C

(claim)

Write a statement that responds to the question.

Liquid 1 and liquid 4 are the same substance.

E

(evidence)

Provide scientific data to support your claim. You should only use appropriate (relevant) data and include enough data to convince someone that your claim is correct. This can be bullet points instead of sentences.

- Have same melting point
- Have same density
- Both colorless

R

(reasoning)

Explain why your evidence (data) supports your claim. In other words, how does your data prove your point? Your explanation must include scientific principles/knowledge that you have about the topic to prove that your evidence supports your claim.

Liquid 1 and liquid 4 are the same substance. In order for two liquids to be the same substances, they must have the same properties. Liquid 1 and liquid 4 both have the same densities, melting points and color. Therefore, liquid 1 and liquid 4 are the same substance.

Taken and adapted from: <https://diggingdeepintoscienceliteracy.wikispaces.com/file/view/C-E-R+template.docx>