

WHO POISONED THE LEMONADE? CSI INVESTIGATION

CER Practice

CER CLAIM EVIDENCE REASONING

• FORENSIC CRIME SCENE INVESTIGATION •

Middle School

Forensic Science

NGSS Aligned

Print & Digital

Who contaminated the lemonade?

LOW-PREP CER MYSTERY

GRADES 6-8

ANALYZE EVIDENCE • WRITE A CLAIM • SOLVE THE CASE

Scroll Through

To take a peek inside!

Help students analyze data, pull out key details from passages, and then share their findings in a CER.

Resource *includes*

- ✓ Teacher presentation
- ✓ Student journal
- ✓ Incident reports
- ✓ Forensic reports
- ✓ writing template
- ✓ Grading rubric
- ✓ Sentence starters and student self-assessment checklist

WHO POISONED THE LEMONADE? CSI INVESTIGATION

CER Practice

Evidence Report

DETAILED REPORT:

Item No. : RMS01, RMS02, RMS03, RMS04
Case No. : USLE1642
Date of Collection: 06/05/26
Collected by: Officer Valeria Chen
Location of Collection:
215 N 2nd Ave.
Upland, California 91786

DESCRIPTION OF EVIDENCE:

Liquid found in pitcher 1, 2, 3, and 4

Pitcher	Amount Remaining
Pitcher 1 (RMS01)	Full
Pitcher 2 (RMS02)	Full
Pitcher 3 (RMS03)	About 1/4 full
Pitcher 4 (RMS04)	Almost empty

CHAIN OF CUSTODY:

Received From: Officer Valeria Chen
Received By: Darik Smith
Date Processed: 06/06/2026

Evidence Report

RT:

DEB02, DEB03, DEB04,
642
06/05/26
icer Valeria Chen
n:

EVIDENCE:

and the booth: white powder 1, white powder 2, white powder 3,
der 5

Appearance	pH	Reaction with Vinegar	Dissolves in Water
Fine white granules	7	No reaction	Yes — clear
Fine white powder	8	Slight bubbling	Yes — slightly cloudy
Fine white powder	7	Slight bubbling	Yes — cloudy
Fine white powder	3	No reaction	Yes — clear
granular powder	11	Strong bubbling	Yes — clear

DO YOUR STUDENTS STRUGGLE WITH



Interpreting data



Finding the key details
in passages



Using evidence to
support a claim



Using reasoning to link
the evidence to the
claim



I've Got You Covered

- ✓ Engaging lesson where the students become the detectives
- ✓ Data tables to interpret
- ✓ Police report for students to pull out key details
- ✓ Journal to help students record their observations
- ✓ Sentence support to help them write their CER



This activity was a great way to work on CER without being too "science-y." I teach 9th grade instructional biology and this was just the right amount of science and writing. My students lose interest very quickly and solving the mystery kept them guessing. After every piece of evidence, they were were trying to figure out how he died. Great resource!- Carolynn

CER Practice

Date of Collection: 06/05/26

Personal Profile



Festival Booth & Role

Owner of Citrus King, the rival stand right next door; sells lemonade and chips.

Relationship to the Case:

Competing vendor

Descriptors:

Short greying hair and beard, 6'0", 210 lbs, wears size 11 work shoes

Dev Smith
Name

Where was the person during the time of the incident?

At his own Citrus King booth, which sat directly beside Sunny Squeeze. Witnesses saw him moving between the two booths and near Maya's serving table during the busy rush.

Potential Motive?

Dev had been losing customers to Maya's longer lines all summer and complained that he "can't win while Maya is here." If Sunny Squeeze had to close, his own sales would go up.

Additional information?

Dev uses washing soda to scrub and clean his lemonade equipment between batches. He prides himself of having his lemonade only use fresh lemons, sugar and water that's it.

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Evidence Report

DETAILED REPORT:

Item No. : N/A

Case No. : USLE1642

Date of Collection: N/A

Collected by: N/A

Location of Collection: N/A

DESCRIPTION OF EVIDENCE:

Chemical analysis of known powders

Substance	Appearance	pH	Reaction with Vinegar	Dissolves in Water	Effect if Swallowed
Table salt (NaCl)	Coarse white crystals	7 (neutral)	No reaction	Yes — clear	Safe in small amounts
Sugar (sucrose)	Fine white granules	7 (neutral)	No reaction	Yes — clear	Safe — sweet
Citric acid	Fine white powder	3 (acidic)	No reaction	Yes — clear	Safe — very sour
Soda (sodium carbonate)	Fine white powder	8 (mildly basic)	Slight bubbling	Yes — slightly cloudy	Mild — bitter taste
powder	Fine white powder	7 (neutral)	Slight bubbling	Yes — cloudy	Mild
Soda (carbonate)	White granular powder	11 (strongly basic)	Strong bubbling	Yes — clear	Harmful — nausea & vomiting
Salt (sulfate)	White crystals	6 (near neutral)	No reaction	Yes — clear	Stomach upset / cramps

- ✓ **Reading police reports**
- ✓ **Analyzing and interpreting data from the forensic reports**

Fingerprints and chemical reports

- ✓ **Organizing their thoughts**
- ✓ **Answering the question as to what happened using claim, evidence, reasoning**

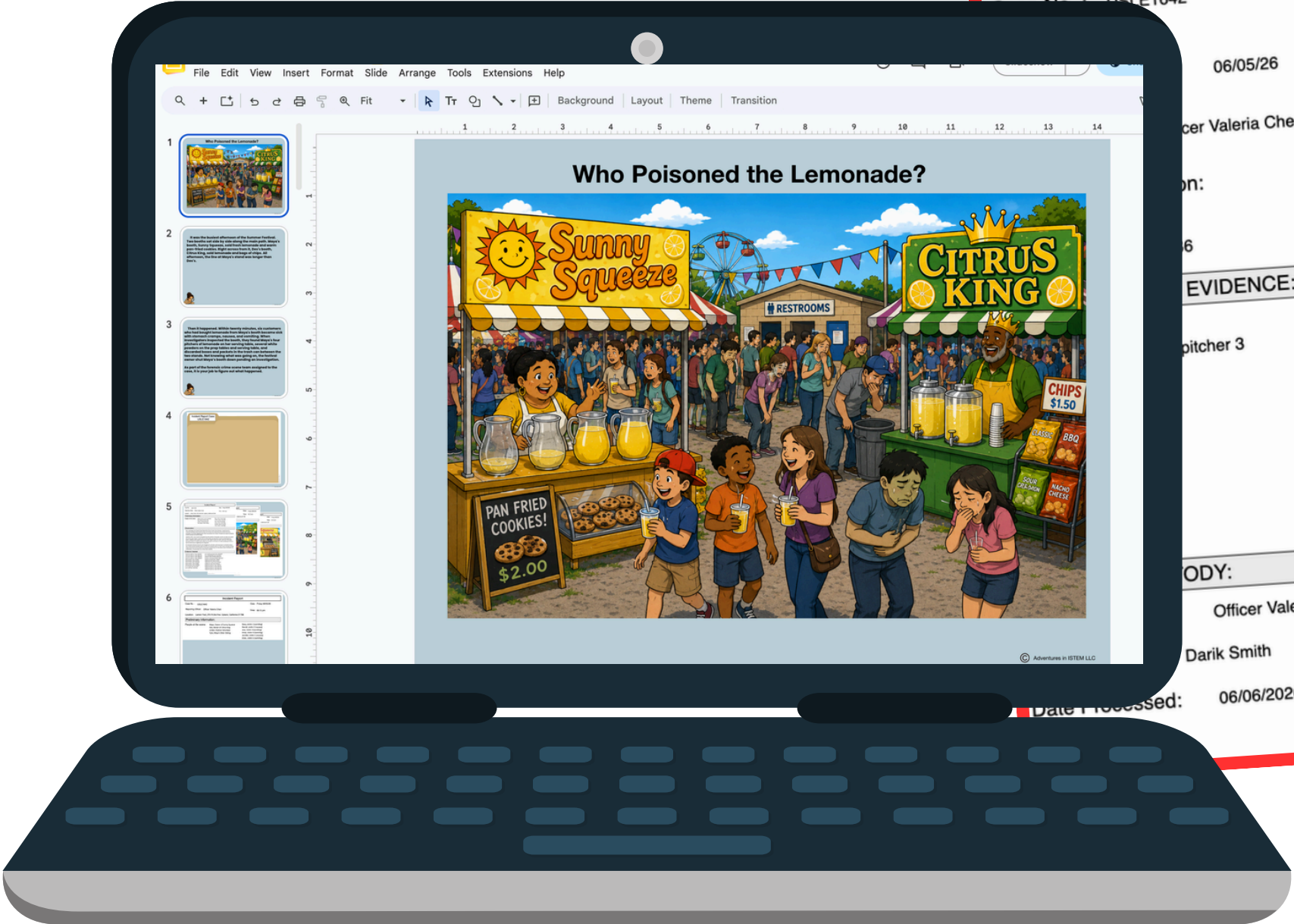
Introduce the Case and have students go through the police reports



Student journal



Police reports



Evidence Report

DETAILED REPORT:

Item No. : Item #SPT03

USLE1642

06/05/26

Officer Valeria Chen

on:

6

EVIDENCE:

pitcher 3

ODY:

Officer Valeria Chen

Darik Smith

Date Processed: 06/06/2026

Partial fingerprint

Incident Report

Case No. : USLE1642

Date: Friday 06/05/26

Reporting Officer: Officer Valeria Chen

Time: 06:15 pm

Location: Lemon Fest, 215 N 2nd Ave. Upland, California 91786

Photographs

Sunny Squeeze

FRESH SQUEEZED HAPPINESS!

PAN FRIED COOKIES! \$2.00

CHIPS \$1.50

BBQ

MAC & CHEESE

SUGAR

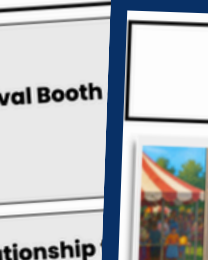
SALT

CITRIC ACID

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Next, have them look at the different profiles of the suspects

Personal Profile	
	Festival Booth Role Relationship Case: Descriptors
Maya Gomez Name	
Where was the person during the time of the	
Working behind her own booth the entire afternoon. Many customers and her sibling can confirm she was there.	
Potential Motive?	
A ruined batch hurts Maya's own reputation and a possible reason would be to file an insurance claim. Her sibling Squeeze had the longest lines at the festival.	
Additional information?	
Maya is in charge of making her lemonade from scratch using lemons, sugar, citric acid. It's what sets her apart from others. After her sibling became sick and cooperated fully with investigators, she decided to open her own booth.	

Personal Profile	
	Festival Booth Role Relationship Case: Descriptors
Tyler Gomez Name	
Where was the person during the time of the	
At the cookie prep table beside the lemonade stand. He was seen frying cookies during the rush.	
Potential Motive?	
Tyler was frustrated about giving up his weekend job to help out saying he "wished the booth would just close so he could go back to work."	
Additional information?	
Tyler handles the making of the cookies and manages the ingredients like soda, baking powder, eggs, and salt. He is also responsible for cleaning the soda and vinegar for that.	

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Personal Profile	
	Festival Booth & Role Helps make cookies boost
Relationship to the Case:	Booth h sibling)
Descriptors:	Short dark hair goatee, 5'9", 18 shoes
Name Tyler Gomez	
Where was the person during the time of the incident? At the cookie prep table beside the lemonade station for most of the afternoon. Maya him frying cookies during the rush.	
Potential Motive? Tyler was frustrated about giving up his weekends to work at the booth for free and wa saying he "wished the booth would just close for once."	
Additional information? Tyler handles the making of the cookies and creates them from scratch using: flour, sugar soda, baking powder, eggs, and salt. He is also in charge of cleaning the equipment and soda and vinegar for that	



Dev Smith

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Potential Mo

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Additional I

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© Adventures in STEM 2016

Personal Profile



Dev Smith

Name

Festival Booth & Role

Owner of Citrus King, the rival stand right next door; sells lemonade and chips.

Relationship to the Case:

Competing vendor

Descriptors:

Short greying hair and beard, 210 lbs, wears size 11 work shoes

Where was the person during the time of the incident?

At his own Citrus King booth, which sat directly beside Sunny Squeeze. Witnesses saw him moving between the two booths and near Maya's serving table during the busy rush.

Potential Motive?

Dev had been losing customers to Maya's longer lines all summer and complained that "can't win while Maya is here." If Sunny Squeeze had to close, his own sales would go up.

Additional information?

Dev uses washing soda to scrub and clean his lemonade equipment between batches. He prides himself on only using fresh lemons, sugar and water for his lemonade.

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Personal Profile	
	Festival Booth & Role Festival volunteer; restocks cups, napkins, ice, and supplies for all of the booths.
Jordan Ferris	Relationship to the Case: Volunteer with access to every booth
Name	Descriptors: Wavy brown hair, green volunteer shirt, 5'10", 160 lbs, wears size 10 sneakers
Where was the person during the time of the incident? Moving between many booths all afternoon delivering supplies. Helped carry a crate of lemons to Maya's booth and Dev's booth that morning.	
Potential Motive? No known reason to harm Sunny Squeeze. Jordan is friendly with all of the vendors and volunteers for the whole festival.	
Additional information? Jordan sometimes helps the booth owners clean up their area and wash their equipment.	

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Then, have them review the various forensic evidence: They will match the fingerprints and the unknown substances to known substances.

Evidence Report

DETAILED REPORT:

Item No. : Item #SPT03

Case No. : USLE1642

Date of Collection: 06/05/26

Collected by: Officer Valeria Chen

Location of Collection:
215 N 2nd Ave.
Upland, California 91786

DESCRIPTION OF EVIDENCE:

Fingerprints found on pitcher 3

CHAIN OF CUSTODY:

Received From: Officer Valeria Chen

Received By: Darik Smith

Date Processed: 06/06/2026


Partial fin

Evidence Report

DETAILED REPORT:

Item No. : Item #MJW01

Case No. : USLE1642

Date of Collection: 06/05/26

Collected by: Officer Valeria Chen

Location of Collection:
215 N 2nd Ave.
Upland, California 91786

DESCRIPTION OF EVIDENCE:

Fingerprints found on the box of sugar

CHAIN OF CUSTODY:

Received From: Officer Valeria Chen

Received By: Darik Smith

Date Processed: 06/06/2026



Evidence Report

DETAILED REPORT:

Item No. : N/A

Case No. : USLE1642

Date of Collection: N/A

Collected by: N/A

Location of Collection: N/A

DESCRIPTION OF EVIDENCE:

Chemical analysis of known powders

Substance	Appearance	pH	Reaction with Vinegar	Dissolve in Water
Table salt (NaCl)	Coarse white crystals	7 (neutral)	No reaction	Yes
Sugar (sucrose)	Fine white granules	7 (neutral)	No reaction	Yes
Citric acid	Fine white powder	3 (acidic)	No reaction	Yes
Baking soda (sodium bicarbonate)	Fine white powder	8 (mildly basic)	Slight bubbling	Yes
Baking powder	Fine white powder	7 (neutral)	Slight bubbling	Yes
Washing soda (sodium carbonate)	White granular powder	11 (strongly basic)	Strong bubbling	Yes
Epsom salt (magnesium sulfate)	White crystals	6 (near neutral)	No reaction	Yes

CHAIN OF CUSTODY:

Received From: Officer Valeria Chen

Received By: Darik Smith

Date Processed: 06/06/2026

Evidence Report

DETAILED REPORT:

Item No. : RMS01, RMS02, RMS03, RMS04

Case No. : USLE1642

Date of Collection: 06/05/26

Collected by: Officer Valeria Chen

Location of Collection:
215 N 2nd Ave.
Upland, California 91786

DESCRIPTION OF EVIDENCE:

Liquid found in pitcher 1, 2, 3, and 4

Pitcher	Amount Remaining	pH
Pitcher 1 (RMS01)	Full	3
Pitcher 2 (RMS02)	Full	3
Pitcher 3 (RMS03)	About 1/4 full	8
Pitcher 4 (RMS04)	Almost empty	3

CHAIN OF CUSTODY:

Received From: Officer Valeria Chen

Received By: Darik Smith

Date Processed: 06/06/2026



Evidence Report

DETAILED REPORT:

Item No. : DEB01, DEB02, DEB03, DEB04, DEB05

Case No. : USLE1642

Date of Collection: 06/05/26

Collected by: Officer Valeria Chen

Location of Collection:
215 N 2nd Ave.
Upland, California 91786

DESCRIPTION OF EVIDENCE:

white powders found around the booth: white powder 1, white powder 2, white powder 3, white powder 4, white powder 5

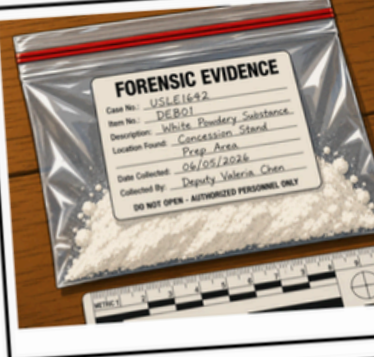
Sample (where found)	Appearance	pH	Reaction with Vinegar	Dissolve in Water
White powder 1 (DEB01)— cookie prep table	Fine white granules	7	No reaction	Yes
White powder 2 (DEB02)— cookie prep table	Fine white powder	8	Slight bubbling	Yes
White powder 3 (DEB03)— cookie prep table	Fine white powder	7	Slight bubbling	Yes
White powder 4 (DEB04)— cookie prep table	Fine white powder	3	No reaction	Yes
White powder 5 (DEB05)— serving table (by the pitchers)	White granular powder	11	Strong bubbling	Yes

CHAIN OF CUSTODY:

Received From: Officer Valeria Chen

Received By: Darik Smith

Date Received: 06/05/26



Students will put all of their findings and state what happened using a claim, evidence, reasoning paragraph

Investigation Notebook

Person of Interest:

Connection to destroyed robot:

Location during crime:

Motivation:

Other key information:

Personal Profiles

Investigation Notebook

Fingerprint analysis - scissors:

Fingerprint analysis - screwdriver:

DNA analysis - hair sample:

Chemical analysis - sticky liquid sample:

Footprint analysis:

Fabric analysis:

Evidence Reports

Evidence

Reasoning

Investigation Notebook

Question: Who sabotaged the robot?

Claim:

Evidence (include only the important details from your evidence):

Reasoning (explain the evidence and draw your conclusion):

Claim, Evidence, and Reasoning

Claim

The claim answers the question. It states what you think. It is written in a scientific sentence using academic language. There should be no "I" in the statement.

Some sentence frames to help you write your claim statement

- The robot was sabotaged by....
- _____ was the person who destroyed the robot.

Evidence

The evidence is the actual observations and forensic evidence from the lab.

Some sentence frames to help you write your evidence statements

- The forensic evidence showed _____.
- According to the _____ report _____.
- During the crime investigation, _____.
- It was discovered that _____.
- Furthermore, ...
- Additionally, ...

Reasoning

The reasoning explains why the evidence supports the claim. It uses knowledge that is already known from science class and real world knowledge to link the evidence to the claim.

Some sentence frames to help you write your reasoning statement

- This indicates _____.
- This supports the claim because _____.
- This is important because _____.
- This suggests that _____.
- I know _____.
- Therefore, I can conclude _____.

HOW TO USE THE RESOURCE IN

3 simple steps

1

Print the PDF version, make copies, and hand out to students

2

Use the digital version by clicking the titles in the RED BOX to make your own copy (found at the end of the PDF)

3

Share the resource with your students using your favorite LMS (Google Classroom, Powerschool (schoolology), Canva...)

Student CER self-assessment

Claim

- ☒ Includes the names of the chemicals in the experiment
- ☒ States if a chemical reaction occurred or not
- ☒ States the answer to the question

Evidence

- ☒ States where the information comes from (according to the data, during the experiment..)
- ☒ Includes observations found in the data table
- ☒ Includes actual numbers when appropriate

Reasoning

- ☒ Explains how the evidence supports the claim
- ☐ States why the evidence is important
- ☒ Includes a concluding sentence

Mechanics

- ☒ No spelling errors
- ☒ No grammar errors
- ☒ Easy to read
- ☒ Includes transition words or sentences

CSI INVESTIGATION

CER Practice

Student CER self-assessment

Claim

☐ Includes the keywords from the question

☐ States the answer to the question

Evidence

SCIENTIFIC EXPLANATION

Grading Rubric

	4	3	2	1	0
Claim	Claim is clear, answers the question, and is supported by evidence.	Claim answers the question, and is supported by evidence.	Claim is clear, answers the question, but is not supported by evidence.	Claim answers the question, but is not supported by evidence.	No claim is stated.
Evidence	Provides appropriate and sufficient evidence that includes measurements or observations that have been analyzed and interpreted to support the claim.	Provides appropriate and sufficient evidence to support the claim.	Provides appropriate but insufficient evidence to support the claim or also includes inappropriate evidence.	Provides inappropriate evidence that does not support the claim.	No evidence is given to support the claim.
Reasoning	Explains correctly, using scientific principles, why the evidence is included and how it supports the claim.	Explains correctly why the evidence is included or how it supports the claim, but both are missing.	Explains why the evidence is included or how it supports the claim, but one is missing.	Explains why the evidence is included or how it supports the claim, but one is missing.	No explanation is given.
Mechanics	The writing is easy to follow, using academic language and details. Contains no grammar or spelling errors.	The writing is easy to follow, using academic language and details. Contains a few grammar or spelling errors.	The writing is easy to follow, using academic language and details. Contains a few grammar or spelling errors.	The writing is easy to follow, using academic language and details. Contains a few grammar or spelling errors.	The writing is difficult to follow, using informal language and details. Contains many grammar or spelling errors.

Comments:

Check out what teachers just like you have said about products like this:



I have to give my students multiple opportunities to write argument essays over the school year. I always love having new ways to explain this process. This was a fun activity that really helped my students understand what to do.- Megan



This was a fantastic way of reviewing CER with my students! They were engaged from the get-go! This year, my students are all about crimes and solving mysteries. This resource allowed them to get into the crime and use their CER skills to determine who might have committed the crime. I kept it open-ended, if they haad solid evidence to prove someone's guilt, then they got the points. I was amazed at how creative they got with the evidence, and how invested they were in solving the crime! Thank you so much for creating this resource, it was amazing!- Heather



My students loved this activity so much! They were so into solving the "crime" that they didn't even realize the work atthey were putting in! An excellent way for them to practice CER in little steps and then allow them to put it all together!- Brea

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3. Download right away

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