

# THERMAL ENERGY

## CER Practice

### CER PRACTICE

**CER Practice C**

Parker is an avid backpacker. They have done many hikes along the California and Oregon coast. A friend invites them to go camping with them in the Eagles nest wilderness outside of Denver. On the first night of the trip, Parker is in charge of making pasta for dinner. The goal is to eat dinner, clean up, and put things away before it gets dark. The sun sets at 8:00 pm, and from their previous camping experience, they know it takes 30 minutes making dinner at 7:00, leaving 30 minutes that the pasta is still not done. They are concerned since the water started boiling sooner than...

**CER Practice A**

Your mom is in the process of building a new restaurant. She needs to buy equipment to cook the food. She looked at different frying pans made of different materials. She found that a pan will transfer heat quickly from the stove burner to the food.

You decide to do a test to investigate heat flow using the same material. One beaker of water is heated. You are looking to see how quickly the heat from the container.

Material	Beaker A temp. at 0 seconds	Beaker E temp. at 0 seconds	Beaker B temp. at 0 seconds	
Aluminum	95	5	40	
Copper	95	5	64.6	
Steel	95	5	89.3	
Glass	95	5	94.9	5.1

Which material should the pan be made out of?

**Digital and Print**

Analyze Data, Interpret Graphs,  
Writing Support, Background  
information, Rubric

# Thermal Energy

# Scroll Through

## To take a peek inside!

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

# DO YOUR STUDENTS STRUGGLE WITH



Interpreting graphs



Finding the key details in passages



Using evidence to support a claim



Using reasoning to link the evidence to the claim

## CER Practice B

Students are investigating different ways to increase the temperature of substances. They perform different tests, changing the volume, pressure, or heat source to see how it affects the temperature of a substance. The data they gathered is below?

Experiment 1: Keep the volume of the gas the same and increase the pressure.

	Time 0 seconds	Time 15 seconds	Time 30 seconds	Time 45 seconds	Time 60 seconds
Pressure (atm)	1	1.5	2	2.5	3
Temperature (°K)	298	447	596	745	864

Experiment 2: Keep the pressure of the gas in the container the same and increase the volume.

	Time 0 seconds	Time 15 seconds	Time 30 seconds	Time 45 seconds	Time 60 seconds
Volume (L)	3	3.5	4	4.5	
Temperature (°K)	298	348	397	447	

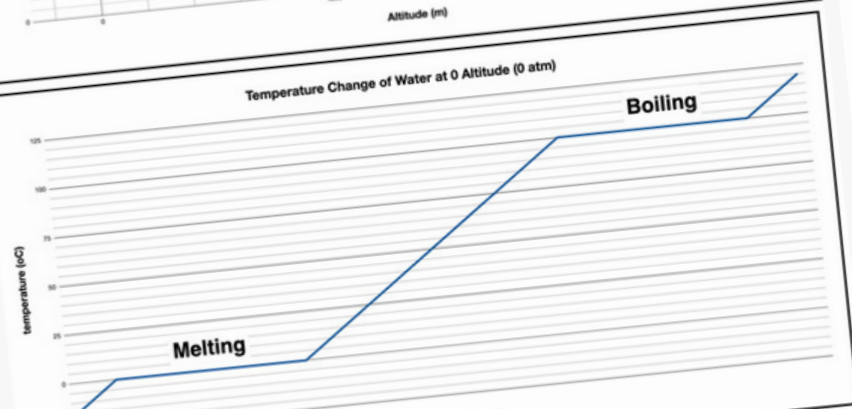
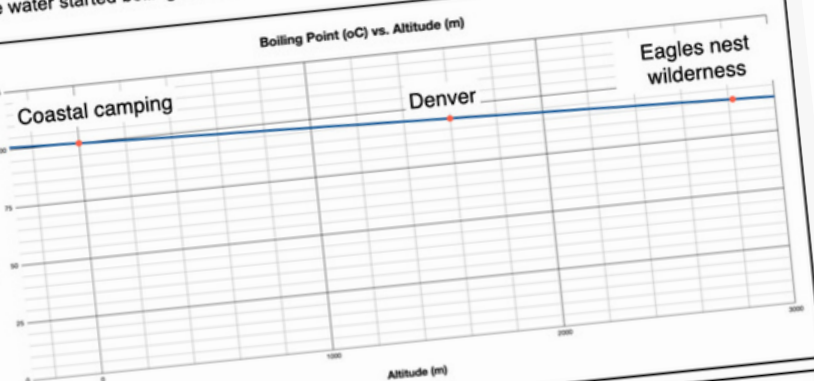
Experiment 3: Keep the volume of the gas the same and increase the heat on the gas burner on high.

	Time 0 seconds	Time 15 seconds	Time 30 seconds	Time 45 seconds
Temperature of flame burner (°K)	425	425	425	425
Temperature (°K)	100	185	245	300

Is adding heat the only way to increase the temperature of a substance?

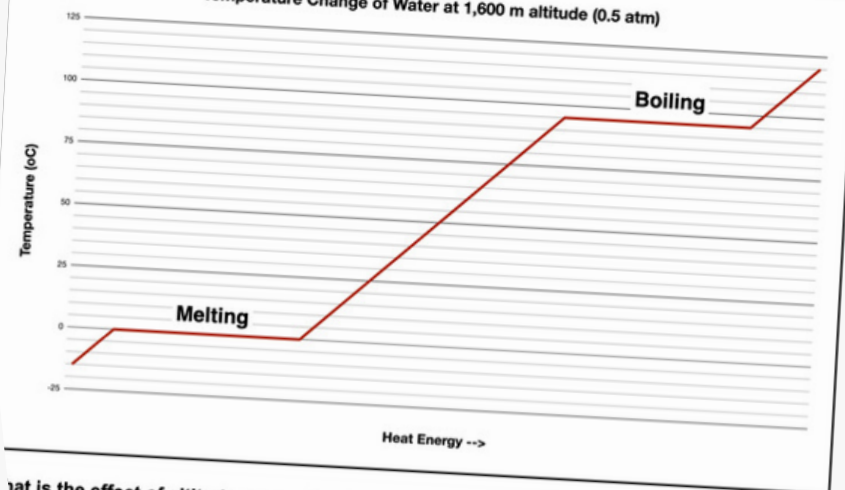
## CER Practice C

is an avid backpacker. They have done many hikes along the California and Oregon coast. invites them to go camping with them in the Eagles nest wilderness outside of Denver. On the of the trip, Parker is in charge of making pasta for dinner. The goal is to eat dinner, clean up, things away before it gets dark. The sun sets at 8:00 pm, and from their previous camping e, they know it takes 30 minutes to cook pasta when camping on the coast. They start inner at 7:00, leaving 30 minutes to eat and clean up before the sun sets. At 7:45, they notice pasta is still not done. They are confused as to why it is taking so much longer, especially water started boiling sooner than it did on their coastal trips.



## CER Practice C

Temperature Change of Water at 1,600 m altitude (0.5 atm)



What is the effect of altitude on cooking?

# I've Got You Covered

- ✓ Simple one page background information students can use for the reasoning
- ✓ Data tables and graphs to interpret
- ✓ Scenarios for students to pull out key details
- ✓ Graphic organizers to help students sort their evidence from their reasoning
- ✓ Sentence support to help them write their CER
- ✓ Self-assessment check list



**Great resource to teach  
the process of CER.  
Students were very  
engaged!**

# THERMAL ENERGY

## CER Practice

**CER Practice A**

Your mom is in the process of building a new restaurant. She needs to buy equipment to cook the food. She looked at different frying pans made out of other materials. A good frying pan will transfer heat quickly from the stove burner to the food allowing the chef to control the cooking process.

You decide to do a test to investigate heat flow through different materials. You connect to beakers using the same material. One beaker contains hot water, and the other has cold water. You are looking to see how quickly the heat from the hot water container gets transferred to the cool water container.

Material	Beaker A temp. at 0 seconds	Beaker B temp. at 0 seconds	Beaker A temp. at 120 seconds	Beaker B temp. at 120 seconds	Beaker A temp. at 300 seconds	Beaker B temp. at 300 seconds
Aluminum	95	5	74.3	47.3	40	47.3
Copper	95	5	64.3	47.3	40	47.3
Steel	95	5	89.3	47.3	40	47.3
Glass	95	5	94.9	47.3	40	47.3

Which material should the pan be made out of?

**Student CER self-assessment**

Words from the question  
relevant to the question

Information comes from (according to the data, text, etc.)

Reasons found in the data table or graph  
Numbers when appropriate

Evidence supports the claim  
Evidence is important  
Reasoning sentence

References

# What Are *students* Doing?

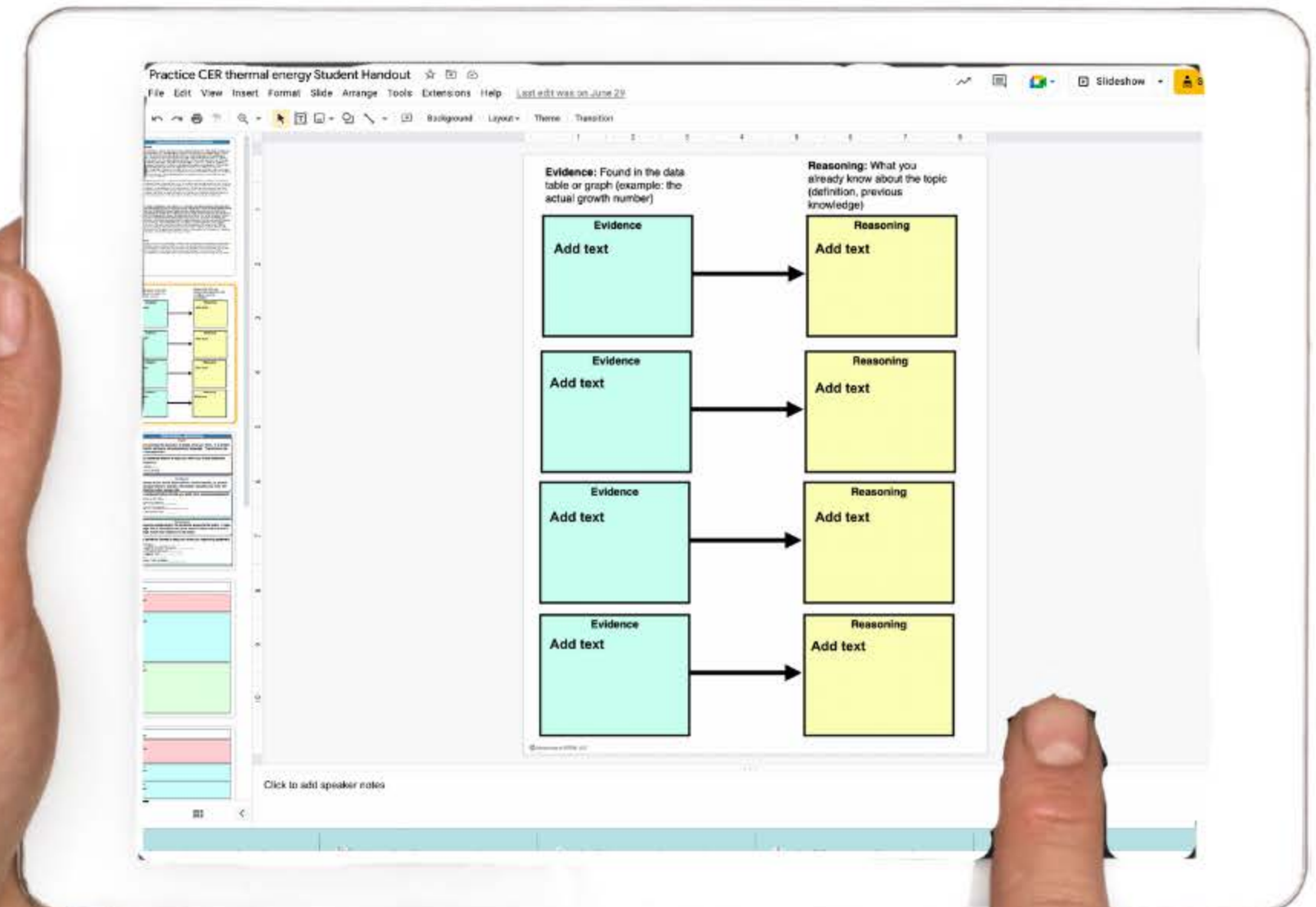
- Marking the text
- Analyzing and interpreting data and graphs
- Organizing their thoughts
- Answering the question prompt using claim, evidence, reasoning

# Resource *includes*

- ✓ 4 science passages with data to interpret
- ✓ Background reading passage about the topic
- ✓ graphic organizer to organize evidence and reasoning
- ✓ 3 graphic organizers to help write their CER
- ✓ Grading Rubric with example answers
- ✓ Sentence starters and student self-assessment checklist

## THERMAL ENERGY

### CER Practice



# 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...)

**Interactive Digital Flip Book**

### Teacher's Guide

**What You Will Need To Get Started:**

1. Google Resource - Download by clicking on the titles in the red box.

CER practice thermal energy A-D

CER practice thermal energy student handout

2. Access to the internet and a Google account (free).
3. Google accounts or Microsoft OneDrive accounts for your scholars to save their work.


**Using the Google Resource:**

Open the file on your Google Drive. The link will prompt you to make a copy.

Google Drive

Copy document

Would you like to make a copy of Acids and Bases Flip Book?



This new copy is now yours to edit and share with your scholars.

The file is printable to allow you to print the finished product as an actual flip book.

Adventures in iSTEM, LLC

# THERMAL ENERGY

## CER Practice

Possible answer for CER Practice C

**Question:** What is the effect of altitude on cooking?

**Claim:** \_\_\_\_\_  
\_\_\_\_\_ which increases the \_\_\_\_\_

**Evidence 1:** \_\_\_\_\_  
\_\_\_\_\_ de, water boils at \_\_\_\_\_  
\_\_\_\_\_ oC at the Eagle \_\_\_\_\_  
\_\_\_\_\_ above sea level. \_\_\_\_\_  
\_\_\_\_\_ t boiling

**Reasoning 1:** \_\_\_\_\_  
\_\_\_\_\_

**Evidence 2:** \_\_\_\_\_  
\_\_\_\_\_ temperature. \_\_\_\_\_  
\_\_\_\_\_ 65°F for it \_\_\_\_\_  
\_\_\_\_\_ usual, it \_\_\_\_\_

**Reasoning 2:** \_\_\_\_\_  
\_\_\_\_\_ ting the \_\_\_\_\_

**Concluding sentence:** \_\_\_\_\_  
\_\_\_\_\_

Adventures in STEM, LLC

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



"Great resource for incorporating literacy/comprehension into the science classroom" – Kimberly B.

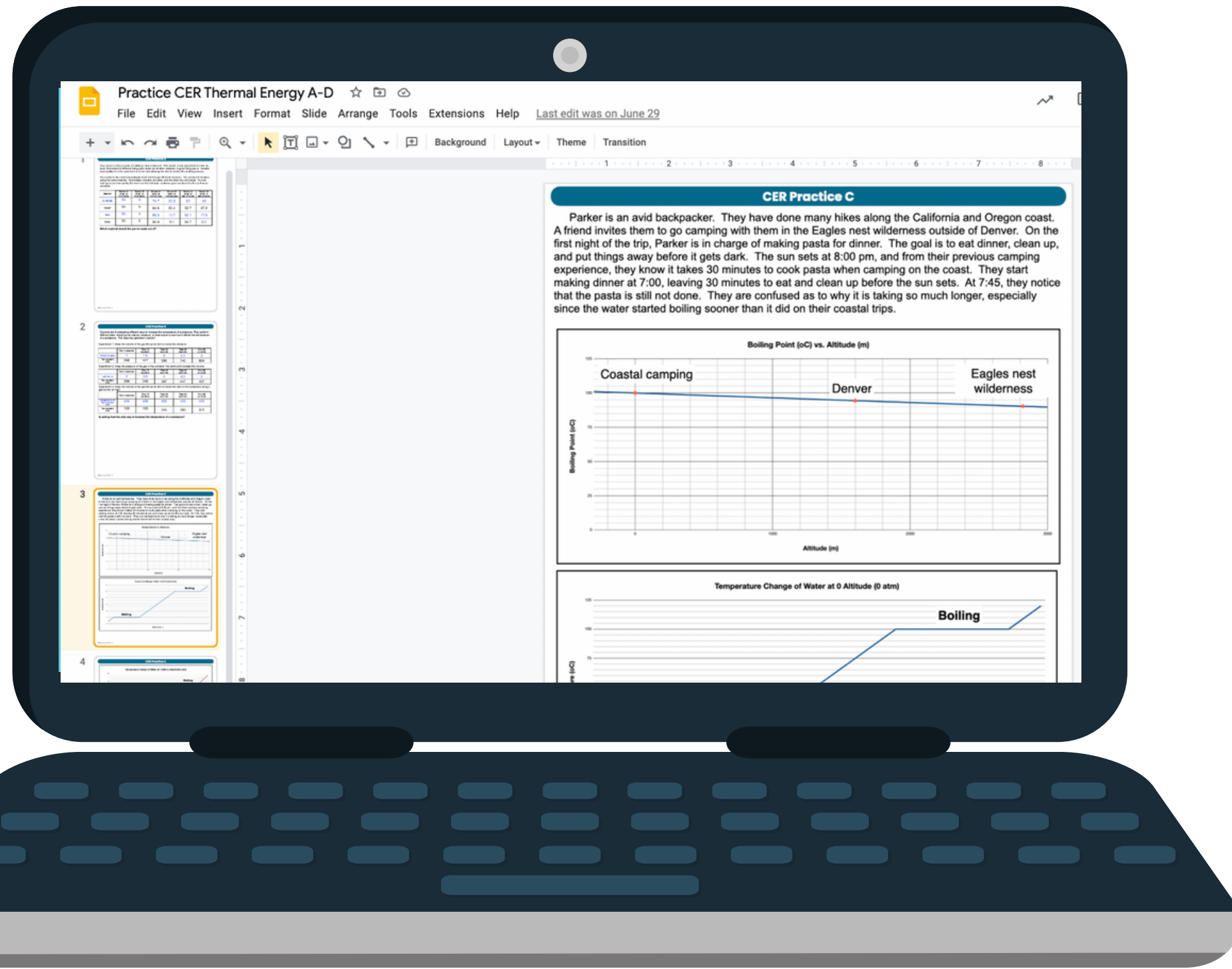


"Students have been really focusing on CER this year in preparation for transitioning to high school. This proved to be challenging as they had to APPLY the context clues given in the written section and the lab results section. I loved that for them. It wasn't too easy! Definitely will be using again this year!" – Jaime S.



"great addition to the unit we are working on"  
Laurie S.

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## All About CER



Help students master CER with these simple steps. Watch the video!

### CER Crime Scene Investigation

The Case of Sir Edward Berkshire the third

**Analyze Police Report and Forensic Evidence**

**Solve the Case using CER**

**Print and Digital**

Get started with CER with this Crime Scene Investigation

## CER BUNDLE

Digital and Print

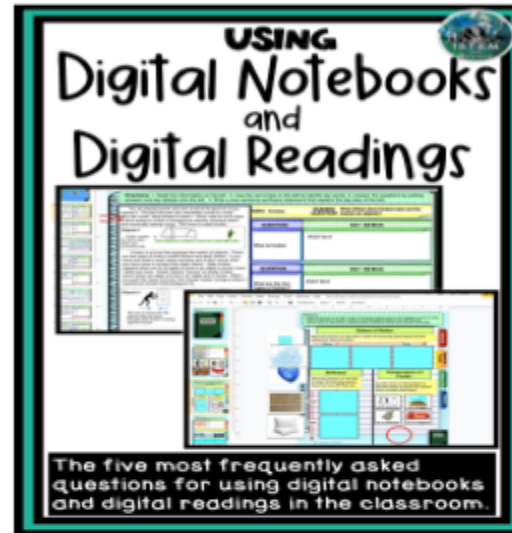
25 experiments to analyze, Writing Support, Grading Rubric  
Practice Activities

Save money and grab the bundle

## Digital Resources

### Using Digital Products?

If you are new to using digital lessons than I recommend to check out my blog post that contains the most frequently asked questions. Click the picture for the link.



I would also recommend checking out my Google Slide videos that demonstrate how to drag and drop pieces, write in the text boxes, add objects, and more. These are short videos that can easily be shared with students and parents. Click the picture for the link



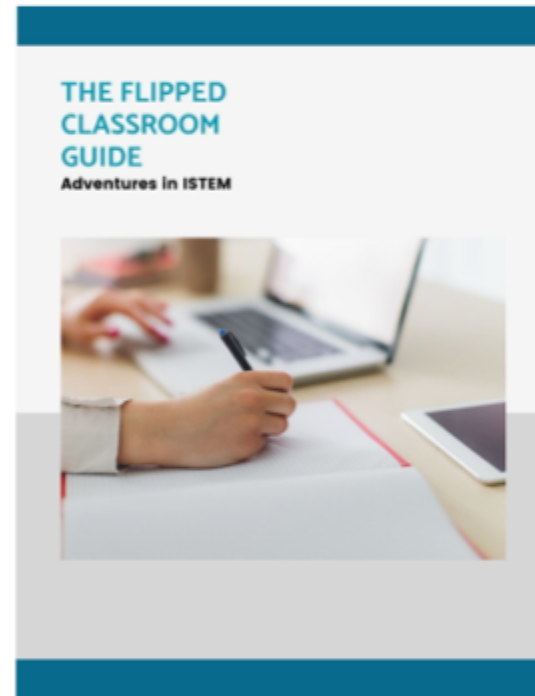
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