

CCPS Science Unit Plan

Grade	3rd	Subject	Science	Unit	3
Unit Name	Heat Energy		Timeline	6 weeks November 4th - December 20th	
How to use the Framework	<p style="color: red;">This Framework should be used to implement daily science instruction. The resources and instructional strategies reflected in the Framework will provide a foundation for effective implementation and student mastery of standards.</p> <p style="color: red;">Please see the hyperlinked abbreviation document to ensure understanding of all abbreviations used with this framework.</p> <p style="color: red;">CCPS Department of Science Website for access to all unit frameworks</p>				
Unit Overview	<p style="color: red;">*All resources related to this Framework are either embedded in this document or can be located via the Science Department website.</p> <p>Background: In this unit, students will obtain, evaluate, and communicate information that describe ways in which heat energy is transferred and measured. Heat is a transfer of energy from one location to another, and it can cause a change in temperature and examples of producing heat are burning objects, rubbing two objects together (friction), and sunlight. Students will need to understand how the Sun transfers heat to the surface of Earth unevenly, the effect of the Sun’s heat can be measured using a thermometer in either Fahrenheit or Celsius, the Sun’s heat can have different effects on different objects and how we can design and build structures that increase or decrease the warming effects of the Sun on different objects.</p> <p>Prerequisites: S1P1b - Sources of Light</p> <p>By the end of this unit the student will be able to: Plan and carry out investigations, gather data, ask questions, identify heat sources and construct a warming device; that can increase and decrease the effects of the sun.</p> <p>By the end of this unit the teacher should: have provided multiple ways for the students to communicate their knowledge of how heat energy is transferred and measured through assessments, inquiries and labs.</p> <p>Teacher Notes</p>				
Standards	GSE	Science and Engineering Practices	Crosscutting Concepts		
	<p>S3P1: Obtain, evaluate, and communicate information about the ways heat energy is transferred and measured.</p> <p>a. Ask questions to identify sources of heat energy.</p>	<p>Ask Questions</p> <p>A practice of science is to ask and refine questions that lead to descriptions and explanations of how the natural and designed world works and which can be empirically tested.</p> <p>Plan and Carry Out Investigations</p>	<p>Cause and Effect Mechanism and explanation. Events have causes, sometimes simple, sometimes multifaceted. A major activity of science is investigating and explaining causal relationships and the mechanisms by which they are mediated. Such mechanisms can then be</p>		

	<p>b. Plan and carry out an investigation to gather data using thermometers to produce tables and charts that illustrate the effect of sunlight on various objects.</p> <p>c. Use tools and everyday materials to design and construct a device/structure that will increase/decrease the warming effects of sunlight on various materials.</p>	<p>Scientists and engineers plan and carry out investigations in the field or laboratory, working collaboratively as well as individually. Their investigations are systematic and require clarifying what counts as data and identifying variables or parameters.</p> <p>Construct Explanations The products of science are explanations and the products of engineering are solutions.</p> <p>Develop and Use Models A practice of both science and engineering is to use and construct models as helpful tools for representing ideas and explanations. These tools include diagrams, drawings, physical replicas, mathematical representations, analogies, and computer simulations.</p> <p>Analyzing and Interpreting Data Scientific investigations produce data that must be analyzed in order to derive meaning. Because data patterns and trends are not always obvious, scientists use a range of tools—including tabulation, graphical interpretation, visualization, and statistical analysis—to identify the significant features and patterns in the data. Scientists identify sources of error in the investigations and calculate the degree of certainty in the results. Modern technology makes the collection of large data sets much easier, providing secondary sources for analysis.</p>	<p>tested across given contexts and used to predict and explain events in new contexts. Structure and function</p> <p>Energy and matter: Flows, cycles, and conservation. Tracking fluxes of energy and matter into, out of, and within systems helps one understand the systems’ possibilities and limitations.</p> <p>Scale, proportion, and quantity: In considering phenomena, it is critical to recognize what is relevant at different measures of size, time, and energy and to recognize how changes in scale, proportion, or quantity affect a system’s structure or performance.</p>
<p>NGSS Alignment</p>	<p>NGSS Alignment to Disciplinary Core Ideas</p>		

The Phenomenon Protocol




Anchoring Phenomena	Learning Targets
S3P1a Original Swedish Angel Chimes	The students will be able to ask questions to identify sources of heat energy.
S3P1b	The students will plan and carry out an investigation to gather data using thermometers to produce tables and charts that illustrate the effect of sunlight on various objects.
S3P1c Ice Melting Blocks	The students will be able to use tools and materials to design and construct a device/structure that will increase/decrease the warming effects of sunlight on various materials.

Weekly Lesson Tasks

Navigation: [Week 1](#) | [Week 2](#) | [Week 3](#) | [Week 4](#) | [Week 5](#) | [Week 6](#) | [Return to top](#) | [Assessment Prep](#)

Week 1

[Standards](#) | [Phenomenon](#) | [Weekly Lessons](#)

GSE: S3P1a		Focused Concept: Identifying the sources that produce heat energy.		
Learning Target	The students will be able to ask questions to identify sources of heat energy.			
LabSafety and Materials	w General Safety Practices for the Elementary Science Classroom- TOC.docx			
SEP Teacher Tip:(Day 1 and 3) To support students with the science and engineering practices for this week, follow the guidance in this protocol:	Developing model construction questions Provide constructive feedback for building a model Student back pocket questions			
Phenomenon: Candle Chimes  S3P1a.PNG			DQ: What are some different sources of heat energy?	
Day 1: Opening	Day 2 : Guided Practice/ Transition	Day 3: Independent Practice	Day 4: Independent Practice	Day 5: Assessment / Summary
Phenomenon Introduction  S3P1a.PNG	Introduce the Driving Question:	Graphic Organizer Investigation Needs:  mystery-science (1).pdf	Text Annotation Strategy Have students read and	Claim-Evidence-Reasoning Students will write a response to

[Original Swedish Angel Chimes](#)

TSW show the phenomenon card and watch the corresponding video to complete the

[See, think wonder strategy protocol](#)

Teachers should provide students opportunities to share observations and develop questions. The teacher should record students' observations and questions on chart paper and refer back to initial student ideas throughout the week.

Inquiry Activity

Produce Heat Energy

Procedures:

Tell students they will participate in an ice cube race to see who can melt their ice cube the quickest. Distribute an ice cube and towel to each pair of students. Place your own ice cube on foam for observation. Start a timer and instruct students to begin melting their ice cubes using their chosen methods, such as holding it, using a coat, rubbing it with a towel, placing it near a heat source, or blowing warm breath on it.

****TEACHER NOTE:**

Teacher facilitation instructions:
■ Science_3rd_Heat Inquir...
Provide towels or paper towels for students to manage any water from melting ice cubes to prevent slipping hazards. Ask

What are some different sources of heat energy?

Use the strategy to support students with making connections and understanding the driving question (DQ).

[Visualizing the Driving Question](#)

Click here to access [question words reference chart](#)

The process can be recorded on chart paper with the students or the teacher can complete the graphic organizer.

Be sure to create a reference for students to have throughout the week.

****Teacher Note:** Students should not answer the driving question at this time. Students will need to collect information, data and understanding from the phenomenon strategy, inquiry activity, investigation, text or video protocol and vocabulary strategy to develop a response in the claim-evidence-reasoning format.

(3-5 teachers and students should focus on developing claim, evidence, and reasoning)

Claim-Evidence-Reasoning (CER)

Objective: Expose students to claim-evidence-reasoning (CER) student samples below to review and understand their peers' thoughts on the topic, initiating the process of

■ mystery-science (3).pdf

Student Graphic Organizer

■ mystery-science (2).pdf

■ Inventing a Heat Engine....

Materials

List is included in the Inquiry activity
Desk Lamp
Ruler
scissors
paper cups
pencils with erasers
pipe cleaners
push pins
Rubber bands
bulb(40 watt)

Investigation Facilitation

Objective: In the activity, Heat Spinner, students first make a paper Heat Spinner and observe how air can create movement.

Then, students use their Heat Spinners to experiment with a heat source (an incandescent bulb) and discover how heat energy can make the spinner move in different ways.

Mystery Science

Investigation: *Hands-on activity ONLY

Teacher shows this:

[How long did it take to travel across the country before cars and planes?](#)

Part 1:

Students should work in pairs to construct their device. The construction video is provided by Mystery Science.

annotate the following text:

■ Sources of Heat Article.d...

The teacher should facilitate the following process. Have the students follow the text protocol facilitation directions provided in the following strategy:

■ 3-5 Text Annotation Prot...

Students should complete the following student handout as they work through the text annotation protocol:

[3-5 Information Analysis Student Organizer \(editable\)](#)

■ 3-5 Information Analysis...

During the teacher-led discussion, the teacher should ask the following questions:

*What is Heat Energy?
What is Friction?
How does heat transfer from one object to another?*

****TEACHER NOTE:** Read and review the annotation protocol prior to providing this lesson to students. Students will need to be placed in groups or have an understanding of how the groups will change to limit time used for transitioning.

Vocabulary Strategy

Vocabulary Words:

Friction
Heat energy
energy transfer
invent

the following driving question in the CER format.

What are some different sources of heat energy?

Review the [claim-evidence-reasoning poster](#) with the students

****TEACHER NOTE:** Provide students with sentence starters by sharing on the board:

■ 3-5 Claim-Evidence-Rea...

Have students write their claim-evidence-reasoning

writing a claim

Have students develop a claim which is their answer to the driving question, claim. Students should use all their knowledge from the phenomenon, inquiry activity, investigation, and information analysis protocol to develop an answer to the question.

writing evidence

Students should provide observational or numerical data as their evidence from their investigation and write a short caption or brief description of the data they provide to support their claim.

writing the reasoning

Students will use textual evidence from the "text annotation graphic organizer" to generate the reasoning or justification in the CER format.

students to brainstorm at least three ways to heat their ice cube and record their ideas on their [lab sheet](#).

What do they think caused the ice cube to melt?

Did heat move into the ice? Can heat move?

What other questions do you have?

Use a chart to record student responses:

Materials:

Timer

Science Inquiry lab sheet:

[W Heat Student Investigatio...](#)

Foam Plates

Ice cubes

towel or paper towel

investigation sheet

developing skills for effective argumentation.

The teacher should state the following to students:

“Claim-Evidence-Reasoning or CER is a way of writing that helps students understand and explain what they learn in science investigations and science ideas.”

Review the [claim-evidence-reasoning poster](#) with students.

As a class or in student groups, provide students with this week’s claim-evidence-reasoning sample.

Student Sample

The teacher or students should read over student sample(s) to analyze claim-evidence-reasoning protocol. Ask students to use the CER observations chart to complete the following analysis protocol:

[Claim-Evidence-Reasoning Record Observations Document](#) (google doc)

[Claim-Evidence-Reasoni...](#) (PDF)

1. Identify the student's claim in the sample and have the teacher or students write their observations or questions.

2. Identify the student's evidence in the sample and have the

Part 2 :

Students will work in groups of four to complete the **Heat Source** and **Candle** stations.

These are provided in the mystery science video. Students should complete the graphic organizer as they investigate ****TEACHER NOTE:** In this lab, students will begin to notice that objects feel different. **NOTE: View the mystery science directional video prior to the lesson.**

The teacher will need to set up two of the Experimental Stations with a heat source Heat Source (bulb/lamp) Candle (candle with spinner). Collect all materials and cut out heat spinner squares the day before the lesson.

Try to set up multiple stations of the same two stations above

NOTE:** Heat bulbs and heat lamps can be found in **STEMscopes equipment kits.**

Allow groups to work through a station.

Imagine you're living in the 1800s and can ride trains for the first time. How would you feel about traveling this new way? How do you think your life might change?

Experiment

Vocabulary Strategy:

Four Square

Provide students with the [graphic organizer \(editable\)](#) or [pdf handout](#), explaining its four sections: word, meaning, picture, and sentence.

Use a Think Aloud to demonstrate how to use the graphic organizer with one of the provided vocabulary words.

Allow students to work in collaborative groups. Actively monitor and facilitate small group discussions and review various artifacts (pictures, images, primary sources, charts) to build knowledge of the term.

Have students collaborate to complete the four square strategy for the other vocabulary terms.

Monitor student progress, sharing new ideas for class discussion, and help students distinguish essential from non-essential characteristics.

Allow groups to share their thinking through academic dialogue and compare their completed task with members of other groups.

Have students use the following template to write their claim-evidence-reasoning (CER)

[3-5 Student Writing Template \(editable\)](#)

[3-5 Student Writing Template \(pdf\)](#)

Students should develop an answer to the driving question, claim. *What is making the chime spin?* Students will use observational or numerical data as their evidence in the claim-evidence-reasoning format.

Students will use textual evidence from the “text annotation graphic organizer” to generate the reasoning or justification in the CER format

****TEACHER NOTE:** Have students review the student sample(s) of claim-evidence-reasoning on Day 2. Have students compare their writing to those students' samples. Ask the following questions:

How are your thoughts or understanding similar to another writer on the topic? How are your thoughts or understanding different to another writer on the topic? What would you like to learn more about? Why?

Assessment for Learning:

	<p><i>teacher or students write their observations or questions.</i></p> <p>3. <i>Identify the student's reasoning in the sample and have the teacher or students write their observations or questions.</i></p> <p>Ask the following questions to students as they analyze the student samples:</p> <p>+</p> <p>■ Claim-Evidence-Reasoni...</p> <p>**Teacher Note: As students review the student samples, they will begin to see or read vocabulary. Begin or continue a reference chart of questions or observations about vocabulary. Students will explicitly learn vocabulary on Day 4.</p>			<p>Teacher Copy:</p> <p>■ CCPS 3rd Science Heat ...</p> <p>Students can access this assessment in Illuminate</p>
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Week 2

[Standards](#) | [Phenomenon](#) | [Weekly Lessons](#)

GSE: S3P1a

Focused Concept: Identifying the sources that produce heat energy.

Learning Target

The students will be able to ask questions to identify sources of heat energy.

Lab Safety Materials

■ General Safety Practices for the Elementary Science Classroom- TOC.docx

SEP Teacher Tip: (Day 1 and 3)

[Developing model construction questions](#)

[Provide constructive feedback for building a model](#)

[Student back pocket questions](#)

To support students with the science and engineering practices for this week, follow the guidance in this protocol:

Phenomenon: Candle Chimes ■ S3P1a.PNG		DQ:What is making the candle chime spin?		
Day 1: Opening	Day 2 : Guided Practice/ Transition	Day 3: Independent Practice	Day 4: Independent Practice	Day 5: Assessment / Summary
<p>Phenomenon Introduction ■ S3P1a.PNG</p> <p>Original Swedish Angel Chimes TSW show the phenomenon card and watch the corresponding video to complete the</p> <p>See, think wonder strategy protocol</p> <p>Teachers should provide students opportunities to review initial observations, answer previous week’s questions and develop new questions.</p> <p>The teacher should record students' observations and questions on chart paper and refer back to initial student ideas throughout the week.</p> <p>Inquiry Activity</p> <p>How heat energy is produced</p> <p>■ Producing Heat Energy S...</p> <p>Materials: Producing Heat Energy Sources Inquiry Sheet Computer</p> <p>Procedures: Draw a large circle in the middle of your paper and write “How heat energy is produced”</p>	<p>Introduce the Driving Question:</p> <p><i>What is making the candle spin?</i></p> <p>Use the strategy to support students with making connections and understanding the driving question (DQ).</p> <p>Visualizing the Driving Question</p> <p>Click here to access question words reference chart</p> <p>The process can be recorded on chart paper with the students or the teacher can complete the graphic organizer.</p> <p>Be sure to create a reference for students to have throughout the week. **Teacher Note: Students should not answer the driving question at this time. Students will need to collect information, data and understanding from the phenomenon strategy, inquiry activity, investigation, text or video protocol and vocabulary strategy to develop a response in the claim-evidence-reasoning format.</p> <p>(3-5 teachers and students should focus on developing claim, evidence, and reasoning)</p> <p>Claim-Evidence-Reasoning</p>	<p>Graphic Organizer ■ Producing Heat-Collage ...</p> <p>Materials Scissors (per student) Magazines (1 per student) 1 piece of manila construction paper (per student) Pencil (per student) Glue (per student)</p> <p>Investigation Facilitation:</p> <p>Students will create a collage using magazine pictures to show examples of ways to produce heat from different heat sources.</p> <p>Procedures: Brainstorm ways to produce heat other than starting a fire. Discuss three ways to produce heat energy: burning, rubbing (friction), and natural sources like sunlight. Give each student a sheet of manila paper. Have them fold it into three equal sections. Title each section with one method of producing heat energy (burning, rubbing, natural sources). Provide each student with a magazine. Students search for pictures of different ways to produce heat energy in the magazine (e.g., shaking hands, burning fire, cooking, sunlight, volcano, lighting a match). Instruct students to cut out and glue the pictures into the correct columns on their papers. Allow</p>	<p>Text Annotation Strategy</p> <p>Have students read and annotate the following text:</p> <p>■ What is Heat 3rd Heat E...</p> <p>The teacher should facilitate the following process. Have the students follow the text protocol facilitation directions provided in the following strategy:</p> <p>■ 3-5 Text Annotation Prot...</p> <p>Students should complete the following student handout as they work through the text annotation protocol:</p> <p>3-5 Information Analysis Student Organizer (editable) ■ 3-5 Information Analysis...</p> <p>During the teacher-led discussion, the teacher should ask the following questions:</p> <p><i>What is Heat? What are different types of heat sources? How does heat travel from one source to another?</i></p> <p>**TEACHER NOTE: Read and review the annotation protocol prior to providing this lesson to students. Students will need to be placed in groups or have an</p>	<p>Claim-Evidence-Reasoning</p> <p>Students will write a response to the following driving question in the CER format.</p> <p><i>What is making the chimes spin?</i></p> <p>Review the claim-evidence-reasoning poster with the students</p> <p>**TEACHER NOTE: Provide students with sentence starters by sharing on the board:</p> <p>■ 3-5 Claim-Evidence-Rea...</p> <p>Have students write their claim-evidence-reasoning</p> <p>writing a claim Have students develop a claim which is their answer to the driving question, claim. Students should use all their knowledge from the phenomenon, inquiry activity, investigation, and information analysis protocol to develop an answer to the question.</p> <p>writing evidence Students should provide observational or numerical data as their evidence from their investigation and write a short caption or brief description of the data they provide to support their claim.</p>

inside it.
Draw three lines radiating outward from the central circle. At the end of each line, draw a smaller circle. Inside each smaller circle, write one method of producing heat energy: Outside each smaller circle, write words or draw pictures that further explain each method.

What are some ways we can produce heat energy?

Why is it important to know how to make heat?

Can you draw a picture of one way to make heat energy?

(CER)

Objective: Expose students to claim-evidence-reasoning (CER) student samples below to review and understand their peers' thoughts on the topic, initiating the process of developing skills for effective argumentation.

The teacher should state the following to students:

“Claim-Evidence-Reasoning or CER is a way of writing that helps students understand and explain what they learn in science investigations and science ideas.”

Review the [claim-evidence-reasoning poster](#) with students.

As a class or in student groups, provide students with this week's claim-evidence-reasoning sample.

Student Sample

The teacher or students should read over student sample(s) to analyze claim-evidence-reasoning protocol. Ask students to use the CER observations chart to complete the following analysis protocol:

[Claim-Evidence-Reasoning Record Observations Document](#) (google doc)

Claim-Evidence-Reasoning... (PDF)

1. Identify the student's claim in the sample and have the teacher

students to share and discuss the pictures/examples they found.

**TEACHER NOTE:

Students will need to collect information following the inquiry activity instruction lab sheet. Materials should be prepped the day prior to the lab activity. Ask students to volunteer and bring in magazines from home prior to the collage lab.

What is an example of burning as a way to produce heat?

What is an example of rubbing as a way to produce heat?

What is an example of a natural heat source?

understanding of how the groups will change to limit time used for transitioning.

Vocabulary Strategy

Vocabulary Words:

Heat
Heat Energy
Heat Sources
Temperature
Heat Transfer

Vocabulary Terms Chart

Provide students with the [graphic organizer \(editable\)](#) or [pdf handout](#), explaining its sections: word, *What did it look like in the investigation?*, meaning, image/drawing, connection

Use a Think Aloud to demonstrate how to use the graphic organizer with one of the provided vocabulary words. The teacher should provide the meaning of the word to the students and ask students to provide examples of how the word was represented during the investigation, phenomenon and/or inquiry activity. In the connection column, students should write how the word connects to concepts or observations they gathered during their classroom tasks. Allow students to work in collaborative groups. Actively monitor and facilitate small group discussions and review various artifacts (pictures, images, primary sources, charts) to build knowledge of the term.

writing the reasoning

Students will use textual evidence from the “text annotation graphic organizer” to generate the reasoning or justification in the CER format.

Have students use the following template to write their claim-evidence-reasoning (CER)

[3-5 Student Writing Template \(editable\)](#)

[3-5 Student Writing Template \(pdf\)](#)

****TEACHER NOTE:** Have students review the student sample(s) of claim-evidence-reasoning on Day 2. Have students compare their writing to those students' samples. Ask the following questions:

How are your thoughts or understanding similar to another writer on the topic?
How are your thoughts or understanding different to another writer on the topic?
What would you like to learn more about? Why?

Assessment for Learning:

Have students complete the following assessment to conclude this week's lesson.

Illuminate Assessment Under CCPS 3rd Science Heat Energy Week 2 Assessment

	<p><i>or students write their observations or questions.</i></p> <p>2. <i>Identify the student's evidence in the sample and have the teacher or students write their observations or questions.</i></p> <p>3. <i>Identify the student's reasoning in the sample and have the teacher or students write their observations or questions.</i></p> <p>Ask the following questions to students as they analyze the student samples:</p> <p>+ Claim-Evidence-Reasoni...</p> <p>**Teacher Note: As students review the student samples, they will begin to see or read vocabulary. Begin or continue a reference chart of questions or observations about vocabulary. Students will explicitly learn vocabulary on Day 4.</p>		<p>Have students collaborate, in groups, to complete the vocabulary terms chart for the other vocabulary terms.</p> <p>Allow groups to share their thinking through academic dialogue and compare their completed task with members of other groups.</p>	<p>Student Copy CCPS 3rd Science Heat ...</p> <p>Teacher Copy CCPS 3rd Science Heat ...</p>
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Week 3

[Standards](#) | [Phenomenon](#) | [Weekly Lessons](#)

GSE:S3P1b

Focused Concept: Using thermometers through investigations to produce tables and charts that illustrate the effect of sunlight on various objects.

Learning Target

The students will be able to plan and carry out investigations to gather data using a thermometer to produce tables and charts that illustrate the effect of sunlight on different objects.

Lab Safety

[General Safety Practices for the Elementary Science Classroom- TOC.docx](#)

SEP Teacher Tip: (Day 1 and 3)

[Developing model construction questions](#)

To support students with the science and engineering practices for this week, follow the guidance in this protocol:

[Provide constructive feedback for building a model](#)

[Student back pocket questions](#)

Phenomenon: Different temperature exposure on different playground surfaces.

DQ: Why do different playground surfaces feel differently?

■ S3P1b.PNG

Day 1: Opening	Day 2 : Guided Practice/ Transition	Day 3: Independent Practice	Day 4: Independent Practice	Day 5: Assessment / Summary
<p>Phenomenon Introduction</p> <p>Show students the phenomenon card.</p> <p>■ S3P1b.PNG</p> <p>See, Think, Wonder</p> <p>Teachers should provide students opportunities to share observations and develop questions. The teacher should record students' observations on chart paper and refer back to initial student ideas throughout the week.</p> <p>Inquiry Activity</p> <p>■ Learning to Read and Us... ■ Learning to Read and Us...</p> <p>Materials: Thermometers 3 cups Water different temperatures Stop watch</p> <p>Procedures: Use the thermometer image in the lab task to compare the two temperature scales. Get a tray</p>	<p>Introduce the Driving Question:</p> <p>Have students review the driving question:</p> <p><i>Why do different playground surfaces feel differently?</i></p> <p>Use the strategy to support students with making connections and understanding the driving question (DQ).</p> <p>Visualizing the Driving Question</p> <p>Click here to access question words reference chart</p> <p>The process can be recorded on chart paper with the students or the teacher can complete the graphic organizer.</p> <p>Be sure to create a reference for students to have throughout the week.</p> <p>**Teacher Note: Students should not answer the driving question at this time. Students will need to collect information, data and understanding from the phenomenon strategy, inquiry activity, investigation, text or</p>	<p>Graphic Organizer and Material</p> <p>How does Sunlight Affect Different Materials?</p> <p>■ <i>How does sunlight affect ...</i></p> <p>Investigation Facilitation</p> <p>Objective: Students will observe how heat affects different objects.</p> <p>Materials Stop Watch Water Thermometer metal container Paper container Plastic container Lab activity sheer pencil</p> <p>Procedures: For this activity, students will need three containers that will hold water. Try to find some that are made from different materials, such as paper, metal, or plastic. Fill the containers halfway with room temperature water. Place the containers into</p>	<p>Text Annotation Strategy</p> <p>Have students read and annotate the following text:</p> <p>Epic: <i>The Energy that Warms Us</i> by Jennifer Boothroyd</p> <p>The teacher should facilitate the following process. Have the students follow the text protocol facilitation directions provided in the following strategy:</p> <p>■ 3-5 Text Annotation Prot...</p> <p>Students should complete the following student handout as they work through the text annotation protocol:</p> <p>3-5 Information Analysis Student Organizer (editable)</p> <p>■ 3-5 Information Analysis...</p> <p>During the teacher-led discussion, the teacher should ask the following questions:</p> <p><i>What is the type of heat source? What type of energy is causing the playground objects to heat up? Does the location of the object</i></p>	<p>Claim-Evidence-Reasoning</p> <p>Students will write a response to the following driving question in the CER format.</p> <p><i>Why do playground surfaces feel differently?</i></p> <p>Review the claim-evidence-reasoning poster with the students</p> <p>**TEACHER NOTE: Provide students with sentence starters by sharing on the board:</p> <p>■ 3-5 Claim-Evidence-Rea...</p> <p>Have students write their claim-evidence-reasoning</p> <p>writing a claim Have students develop a claim which is their answer to the driving question, claim. Students should use all their knowledge from the phenomenon, inquiry activity, investigation, and information analysis protocol to develop an answer to the question.</p> <p>writing evidence</p>

with filled cups and thermometers from your teacher. Place a thermometer in each cup. Take a measurement every ten minutes for half an hour. Record the temperature change below.

Ask the following questions and have students record their answers: *Which cup(s) changed temperature the most? Why do you think it changed the most? Which cup changed the least? Why do you think it stayed about the same temperature?*

****TEACHER NOTE:**

In groups, provide each group with a copy of the lab sheet electronically or physical copy. Prep and gather all lab materials.

video protocol and vocabulary strategy to develop a response in the claim-evidence-reasoning format.

(3-5 teachers and students should focus on developing claim, evidence, and reasoning)

Claim-Evidence-Reasoning (CER)

Objective: Expose students to claim-evidence-reasoning (CER) student samples below to review and understand their peers' thoughts on the topic, initiating the process of developing skills for effective argumentation.

The teacher should state the following to students:

“Claim-Evidence-Reasoning or CER is a way of writing that helps students understand and explain what they learn in science investigations and science ideas.”

Review the [claim-evidence-reasoning poster](#) with students.

As a class or in student groups, provide students with this week's claim-evidence-reasoning sample.

Student Sample

The teacher or students should read over student sample(s) to analyze claim-evidence-reasoning protocol. Ask students to use the

a tray and place the tray outside in the sunlight. Check the temperature of the water immediately, and then every ten minutes for two hours. Record the temperature changes in the student lab sheet.

****TEACHER NOTE:**

In groups, provide each group with a copy of the lab sheet electronically or physical copy. Prep lab day before. Gather all lab materials.

In which container did the water temperature increase the most?

In which container did the water increase the least in temperature?

affect the heat energy transfer?

****TEACHER NOTE:** Read and review the annotation protocol prior to providing this lesson to students. Students will need to be placed in groups or have an understanding of how the groups will change to limit time used for transitioning.

Vocabulary Strategy

Vocabulary Words

Sunlight
Temperature
Heat Transfer
Heat Sources
Hypothesis

Vocabulary Terms Chart

Provide students with the [graphic organizer \(editable\)](#) or [pdf handout](#), explaining its sections: word, *What did it look like in the investigation?*, meaning, image/drawing, connection

Use a Think Aloud to demonstrate how to use the graphic organizer with one of the provided vocabulary words. The teacher should provide the meaning of the word to the students and ask students to provide examples of how the word was represented during the investigation, phenomenon and/or inquiry activity. In the connection column, students should write how the word connects to concepts or observations they gathered during their classroom tasks. Allow students to work in collaborative groups. Actively

Students should provide observational or numerical data as their evidence from their investigation and write a short caption or brief description of the data they provide to support their claim.

writing the reasoning

Students will use textual evidence from the “text annotation graphic organizer” to generate the reasoning or justification in the CER format.

Have students use the following template to write their claim-evidence-reasoning (CER)

[3-5 Student Writing Template \(editable\)](#)

[3-5 Student Writing Template \(pdf\)](#)

****TEACHER NOTE:** Have students review the student sample(s) of claim-evidence-reasoning on Day 2. Have students compare their writing to those students' samples. Ask the following questions:

How are your thoughts or understanding similar to another writer on the topic?
How are your thoughts or understanding different to another writer on the topic?
What would you like to learn more about? Why?

Assessment for Learning:

Have students complete the following assessment to conclude this week's lesson.

CER observations chart to complete the following analysis protocol:

[Claim-Evidence-Reasoning Record Observations Document](#) (google doc)

■ Claim-Evidence-Reasoni... (PDF)

1. Identify the student's claim in the sample and have the teacher or students write their observations or questions.

2. Identify the student's evidence in the sample and have the teacher or students write their observations or questions.

3. Identify the student's reasoning in the sample and have the teacher or students write their observations or questions.

Ask the following questions to students as they analyze the student samples:

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■ Claim-Evidence-Reasoni...

****Teacher Note:** As students review the student samples, they will begin to see or read vocabulary. Begin or continue a reference chart of questions or observations about vocabulary. Students will explicitly learn vocabulary on Day 4.

monitor and facilitate small group discussions and review various artifacts (pictures, images, primary sources, charts) to build knowledge of the term.

Have students collaborate, in groups, to complete the vocabulary terms chart for the other vocabulary terms.

Allow groups to share their thinking through academic dialogue and compare their completed task with members of other groups.

Illuminate Assessment under CCPS 3rd Science Heat Energy Week 3 Assessment Teacher Copy:

■ CCPS 3rd Science Unit 3...

Student Copy:

■ CCPS 3rd Science Unit 3...

Week 4

[Standards](#) | [Phenomenon](#) | [Weekly Lessons](#)

GSE: S3P1b

Focused Concept: Using thermometers through investigations to produce tables and charts that illustrate the effect of sunlight on various objects.

Learning Target

The students will be able to plan and carry out investigations to gather data using a thermometer to produce tables and charts that illustrate the effect of sunlight on different objects.

Lab Safety

[W](#) General Safety Practices for the Elementary Science Classroom- TOC.docx

SEP Teacher Tip: (Day 1 and 3)

To support students with the science and engineering practices for this week, follow the guidance in this protocol:

[Developing model construction questions](#)

[Provide constructive feedback for building a model](#)

[Student back pocket questions](#)

Phenomenon: [S3P1b.PNG](#)

DQ: Why do different playground surfaces feel differently?

Day 1: Opening

Day 2 : Guided Practice/ Transition

Day 3: Independent Practice

Day 4: Independent Practice

Day 5: Assessment / Summary

Phenomenon Introduction

Show students the phenomenon card.

[S3P1b.PNG](#)

[See, Think, Wonder](#)

Teachers should provide students opportunities to share observations and develop questions. The teacher should record students' observations on chart paper and refer back to initial student ideas throughout the week.

Inquiry Activity

U Investigate Lab: How can Heat transfer be increased or

Introduce the Driving Question:

Have students review the driving question:
Why do different playground surfaces feel differently?

Use the strategy to support students with making connections and understanding the driving question (DQ).

[Visualizing the Driving Question](#)

Click here to access [question words reference chart](#)

The process can be recorded on chart paper with the students or the teacher can complete the

Graphic Organizer

Teacher copy

[U investigate Lab How d...](#)

Student copy:

[how does sunlight affect ...](#)

Investigation Facilitation

Objective:

Students will investigate the effects of sunlight on various objects.

Materials

Lab Sheet:

[how does sunlight affect ...](#)

Computer
Thermometer
Grid paper

Pencil(for paper copy)
rock
black paper/cloth

Text Annotation Strategy

Have students read and annotate the following text:

[G3_HeatTransfer.pdf](#)

The teacher should facilitate the following process. Have the students follow the text protocol facilitation directions provided in the following strategy:

[3-5 Text Annotation Prot...](#)

Students should complete the following student handout as they work through the text annotation protocol:

[3-5 Information Analysis Student Organizer \(editable\)](#)

[3-5 Information Analysis...](#)

Claim-Evidence-Reasoning

Students will write a response to the following driving question in the CER format.

Why do playground surfaces feel differently?

Review the [claim-evidence-reasoning poster](#) with the students

****TEACHER NOTE:** Provide students with sentence starters by sharing on the board:

[3-5 Claim-Evidence-Reas...](#)

Have students write their claim-evidence-reasoning

decreased?

U investigate Lab- How ...

****TEACHER NOTE:**

Please ensure all materials are gathered the day prior to investigation. Follow the U investigate procedures for the lab. Allow students to work in groups to complete the inquiry activity.

Procedures:

If your students need more direction on this lab, use the following procedure.

Think of ways that you already try to decrease the warming effects of the sun. You have probably stood in the shade or gone in water.

Think of a way that you could use shade or water in your design to reduce the warming effect of the sun on an object.

Measure the temperature of this object in the sun without your device, then in the sun with your device. Repeat with two other objects.

Use the difference in temperature with and without your device to determine how effective it was.

Materials:

Thermometer

[U investigate Lab sheet](#)

graphic organizer.

Be sure to create a reference for students to have throughout the week.

****TEACHER NOTE:**

Students should not answer the driving question at this time. Students will need to collect information, data and understanding from the phenomenon strategy, inquiry activity, investigation, text or video protocol and vocabulary strategy to develop a response in the claim-evidence-reasoning format.

(3-5 teachers and students should focus on developing claim, evidence, and reasoning)

Claim-Evidence-Reasoning (CER)

Objective: Expose students to claim-evidence-reasoning (CER) student samples below to review and understand their peers' thoughts on the topic, initiating the process of developing skills for effective argumentation.

The teacher should state the following to students:

“Claim-Evidence-Reasoning or CER is a way of writing that helps students understand and explain what they learn in science investigations and science ideas.”

Review the [claim-evidence-reasoning poster](#) with students.

white paper/cloth

soil

****TEACHER NOTE:**

Please ensure all materials are gathered the day prior to investigation. Follow the U investigate procedures for the lab. Allow students to work in groups to complete the lab. Note Make sure to have a thermometer that can measure surface temperature. Students will collect temperature data from various objects of different colors in both the sun and shade. They will organize this in a chart, then make a conclusion about how sunlight affects objects.

Procedures:

If your students need more direction on this lab, use the following procedure.

Pick objects outside that have three different colors: dark, medium, and light.

For each color, measure the temperature in the sun and in the shade.

Record the sun and shade temperatures for each object in a chart.

Use the temperature difference in sun and shade to draw a conclusion about how the sun affects temperature. Notice any difference in how it affects darker objects.

During the teacher-led discussion, the teacher should ask the following questions:
What is Heat?
What is temperature?
How does heat transfer between objects?
What does prediction mean?

****TEACHER NOTE:** Read and review the annotation protocol prior to providing this lesson to students. Students will need to be placed in groups or have an understanding of how the groups will change to limit time used for transitioning.

Vocabulary Strategy

Vocabulary Words:

Temperature

Heat

Friction

Predict

Vocabulary Strategy:

Four Square

Provide students with the [graphic organizer \(editable\)](#) or [pdf handout](#), explaining its four sections: word, meaning, picture, and sentence.

Use a Think Aloud to demonstrate how to use the graphic organizer with one of the provided vocabulary words.

Allow students to work in collaborative groups. Actively monitor and facilitate small group discussions and review various artifacts (pictures,

writing a claim

Have students develop a claim which is their answer to the driving question, claim. Students should use all their knowledge from the phenomenon, inquiry activity, investigation, and information analysis protocol to develop an answer to the question.

writing evidence

Students should provide observational or numerical data as their evidence from their investigation and write a short caption or brief description of the data they provide to support their claim.

writing the reasoning

Students will use textual evidence from the “text annotation graphic organizer” to generate the reasoning or justification in the CER format.

Have students use the following template to write their claim-evidence-reasoning (CER)

[3-5 Student Writing Template \(editable\)](#)

[3-5 Student Writing Template \(pdf\)](#)

****TEACHER NOTE:** Have students review the student sample(s) of claim-evidence-reasoning on Day 2. Have students compare their writing to those students' samples. Ask the following questions:

How are your thoughts or understanding similar to

As a class or in student groups, provide students with this week's claim-evidence-reasoning sample.

The teacher will pull students samples from earlier in the unit for peer review. Be sure to hide student names.

The teacher or students should read over student sample(s) to analyze claim-evidence-reasoning protocol. Ask students to use the CER observations chart to complete the following analysis protocol:

[Claim-Evidence-Reasoning Record Observations Document](#) (google doc)

■ Claim-Evidence-Reasoni... (PDF)

1. Identify the student's claim in the sample and have the teacher or students write their observations or questions.

2. Identify the student's evidence in the sample and have the teacher or students write their observations or questions.

3. Identify the student's reasoning in the sample and have the teacher or students write their observations or questions.

Ask the following questions to students as they analyze the student samples:

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■ Claim-Evidence-Reasoni...

images, primary sources, charts) to build knowledge of the term.

Have students collaborate to complete the four square strategy for the other vocabulary terms.

Monitor student progress, sharing new ideas for class discussion, and help students distinguish essential from non-essential characteristics.

Allow groups to share their thinking through academic dialogue and compare their completed task with members of other groups.

*another writer on the topic?
How are your thoughts or understanding different to another writer on the topic?
What would you like to learn more about? Why?*

Assessment for Learning:

Have students complete the following assessment to conclude this week's lesson.

Illuminate test for week 4 at CCPS 3rd Science Unit 3 Heat Energy Week 4 Assessment

Student Assessment Copy:

■ CCPS 3rd Science Unit 3...

Teacher Assessment Copy:

■ CCPS 3rd Science Unit 3...

****Teacher Note:** As students review the student samples, they will begin to see or read vocabulary. Begin or continue a reference chart of questions or observations about vocabulary. Students will explicitly learn vocabulary on Day 4.

Week 5

[Standards](#) | [Phenomenon](#) | [Weekly Lessons](#)

GSE: S3P1c

Focused Concept: Constructing a device/structure that will increase/decrease the warming effects of sunlight on various materials.

Learning Target

The students will be able to use tools and materials to design and construct a device/structure that will increase/decrease the warming effects of sunlight on various materials.

Lab Safety

[W](#) General Safety Practices for the Elementary Science Classroom- TOC.docx

SEP Teacher Tip: (Day 1 and 3)

To support students with the science and engineering practices for this week, follow the guidance in this protocol:

[Developing model construction questions](#)

[Provide constructive feedback for building a model](#)

[Student back pocket questions](#)

Phenomenon: [S3P1c.PNG](#)

DQ: Why did the ice melt faster?

Day 1: Opening

**Day 2 : Guided Practice/
Transition**

Day 3: Independent Practice

Day 4: Independent Practice

Day 5: Assessment / Summary

Phenomenon Introduction

Show students the phenomenon card.

[S3P1c.PNG](#)

[See, Think, Wonder](#)

Teachers should provide students opportunities to share observations and develop

Introduce the Driving Question:

Have students review the driving question:

Why did the ice melt faster?

Use the strategy to support students with making connections and understanding

Graphic Organizer

Students will need and will use the student lab sheet for [Solar Oven Heat Energy](#)

Investigation Facilitation

Solar Oven

Text Annotation Strategy

Have students read and annotate the following text:
Have students read and annotate the following text:

[W](#) Sunlight on the Playgrou...

The text for this week's lesson can be found on Gadoe Inspire Science.

Claim-Evidence-Reasoning

Students will write a response to the following driving question in the CER format.

Why did the ice melt faster?

questions. The teacher should record students' observations on chart paper and refer back to initial student ideas throughout the week.

Inquiry Activity

Is It Getting Hot in Here?

Graphic Organizer:

■ **Is It Getting Hot in Here?.pdf**

Objective: Students will investigate how the Sun's energy heats up materials commonly found on Earth's surface and find a solution to either increase or decrease the effects of sunlight on a material.

Procedures:

Each group needs four aluminum cans, four thermometers, and a heat lamp. Here's what each group should do: Fill one can with at least three inches of slightly damp soil and label it. Fill another can with at least three inches of water (approximately 100 milliliters) and label it. Fill a third can with at least three inches of slightly damp shredded pine mulch and label it. Fill the fourth can with at least three inches of pea gravel or similarly sized rocks and label it. Ensure each can is labeled clearly and placed in the designated area for accurate observations.

****Teacher Note:**

In this investigation, you will be using thermometers and possibly a heat lamp must be very careful with the heat lamp. Never touch the bulb or the part of the lamp that holds the bulb. Do not place paper on or near the bulb. When using the thermometer, do not stir or mix

the driving question (DQ).

[Visualizing the Driving Question](#)

Click here to access [question words reference chart](#)

The process can be recorded on chart paper with the students or the teacher can complete the graphic organizer.

Be sure to create a reference for students to have throughout the week.

****Teacher Note:** Students should not answer the driving question at this time. Students will need to collect information, data and understanding from the phenomenon strategy, inquiry activity, investigation, text or video protocol and vocabulary strategy to develop a response in the claim-evidence-reasoning format.

(3-5 teachers and students should focus on developing claim, evidence, and reasoning)

Claim-Evidence-Reasoning (CER)

Objective: Expose students to claim-evidence-reasoning (CER) student samples below to review and understand their peers' thoughts on the topic, initiating the process of developing skills for effective argumentation.

The teacher should state the following to students:

Objective: TSW create a device that will increase or decrease the warming effect from sunlight..

Procedures:

Sandra wants to take chocolates to her friend's sunny birthday party at the park but worried they'll melt quickly. Students will work in groups to design a structure to keep the chocolates from melting. Use only the provided materials. Design and draw the structure in 5 minutes, then build it in 15 minutes. The structure should keep chocolates from melting outdoors for 10 minutes. Test the structures outside (or indoors with heat lamps if necessary). Compare covered chocolates to one in direct sunlight. Discuss designs and why they might work. Celebrate successful structures and suggest improvements.

****TEACHER NOTE:**

The structure needs to be able to keep the chocolates from completely melting when the chocolates are outside for ten minutes.

*What materials did students use to design their chocolate-melting structures?
How long did groups have to build their structures?
What was the main goal of the structures designed by the students?*

What did students learn about how shade affects the temperature of objects?

Materials:

Allow groups to share their thinking through academic dialogue and compare their completed task with members of other groups.

The teacher should facilitate the following process. Have the students follow the text protocol facilitation directions provided in the following strategy:

■ **3-5 Text Annotation Prot...**

Students should complete the following student handout as they work through the text annotation protocol:

[3-5 Information Analysis Student Organizer \(editable\)](#)

■ **3-5 Information Analysis...**

During the teacher-led discussion, the teacher should ask the following questions:

*What is temperature?
How is temperature measured?
What are the types of temperature?
What type of heat source causes temperature to rise and fall?*

****TEACHER NOTE:** Read and review the annotation protocol prior to providing this lesson to students. Students will need to be placed in groups or have an understanding of how the groups will change to limit time used for transitioning.

Vocabulary Strategy

Vocabulary Words:

Temperature
Celcius

Review the [claim-evidence-reasoning poster](#) with the students

****TEACHER NOTE:** Provide students with sentence starters by sharing on the board:

■ **3-5 Claim-Evidence-Rea...**

Have students write their claim-evidence-reasoning

writing a claim

Have students develop a claim which is their answer to the driving question, claim. Students should use all their knowledge from the phenomenon, inquiry activity, investigation, and information analysis protocol to develop an answer to the question.

writing evidence

Students should provide observational or numerical data as their evidence from their investigation and write a short caption or brief description of the data they provide to support their claim.

writing the reasoning

Students will use textual evidence from the "text annotation graphic organizer" to generate the reasoning or justification in the CER format.

Have students use the following template to write their claim-evidence-reasoning (CER)

[3-5 Student Writing Template \(editable\)](#)

with it and do not tap it against anything. Ideally, conduct the investigation outside in a sunny location. If not possible, use heat lamps as a substitute.

Materials:

Lab Sheets
Heat lamp or Outside Sunny area
4 metal cans
soil
mulch
water
rocks
4 thermometers(one per can)
timer

Why is it important to understand how materials absorb sunlight?

Can you think of other materials not tested that might behave differently in sunlight?

How could this knowledge help us in everyday life or in solving environmental challenges?

“Claim-Evidence-Reasoning or CER is a way of writing that helps students understand and explain what they learn in science investigations and science ideas.”

Review the [claim-evidence-reasoning poster](#) with students.

As a class or in student groups, provide students with this week’s claim-evidence-reasoning sample.

[The teacher will pull students samples from earlier in the unit for peer review. Be sure to hide student names.](#)

The teacher or students should read over student sample(s) to analyze claim-evidence-reasoning protocol. Ask students to use the CER observations chart to complete the following analysis protocol:

[Claim-Evidence-Reasoning Record Observations Document](#) (google doc)

[Claim-Evidence-Reasoning](#) (PDF)

1. Identify the student's claim in the sample and have the teacher or students write their observations or questions.

2. Identify the student's evidence in the sample and have the teacher or students write their observations or questions.

Lab Sheet :

[Solar Oven Heat Energy ...](#)

Cardboard boxes (shoe box, pizza box, cereal boxes)

Foil

Plastic wrap

Wood Skewers

Chocolates

Black construction paper

Timer

Thermometer

Small paper plates

Fahrenheit
Thermometer

Vocabulary Strategy:

Four Square

Provide students with the [graphic organizer \(editable\)](#) or [pdf handout](#), explaining its four sections: word, meaning, picture, and sentence.

Use a Think Aloud to demonstrate how to use the graphic organizer with one of the provided vocabulary words.

Allow students to work in collaborative groups. Actively monitor and facilitate small group discussions and review various artifacts (pictures, images, primary sources, charts) to build knowledge of the term.

Have students collaborate to complete the four square strategy for the other vocabulary terms.

Monitor student progress, sharing new ideas for class discussion, and help students distinguish essential from non-essential characteristics.

Allow groups to share their thinking through academic dialogue and compare their completed task with members of other groups.

[3-5 Student Writing Template \(pdf\)](#)

****TEACHER NOTE:** Have students review the student sample(s) of claim-evidence-reasoning on Day 2. Have students compare their writing to those students' samples. Ask the following questions:

How are your thoughts or understanding similar to another writer on the topic?
How are your thoughts or understanding different to another writer on the topic?
What would you like to learn more about? Why?

Assessment for Learning:

Have students complete the following assessment to conclude this week’s lesson.

Illuminate test at CCPS 3rd Science Unit 3 Heat Energy Week 5 Assessment

Student Copy:


[CCPS 3rd Science Unit 3...](#)

Teacher Copy:

[CCPS 3rd Science Unit 3...](#)

3. Identify the student's reasoning in the sample and have the teacher or students write their observations or questions.

Ask the following questions to students as they analyze the student samples:

+
 Claim-Evidence-Reasoni...

****Teacher Note:** As students review the student samples, they will begin to see or read vocabulary. Begin or continue a reference chart of questions or observations about vocabulary. Students will explicitly learn vocabulary on Day 4.

Week 6

[Standards](#) | [Phenomenon](#) | [Weekly Lessons](#)

GSE:S3P1c

Focused Concept:Constructing a device/structure that will increase/decrease the warming effects of sunlight on various materials

Learning Target

The students will be able to use tools and materials to design and construct a device/structure that will increase/decrease the warming effects of sunlight on various materials.

Lab Safety

Follow Lab Safety Procedures and material list from Lab Inquiry Sheets

SEP Teacher Tip: (Day 1 and 3)

[Developing model construction questions](#)
[Provide constructive feedback for building a model](#)
[Student back pocket questions](#)

To support students with the science and engineering practices for this week, follow the guidance in this protocol:

Phenomenon: Heat sources will cause ice to melt faster.

DQ: What materials can be used to make surfaces cooler?

Day 1: Opening	Day 2 : Guided Practice/ Transition	Day 3: Independent Practice	Day 4: Independent Practice	Day 5: Assessment / Summary
<p>Phenomenon Introduction</p> <p>Show students the phenomenon card.</p> <p>■ S3P1c.PNG</p> <p>See, Think, Wonder</p> <p>Teachers should provide students opportunities to share observations and develop questions. The teacher should record students' observations on chart paper and refer back to initial student ideas throughout the week.</p> <p>Inquiry Activity</p> <p><i>What materials can you use to make the dog's paws not burn on the pavement?</i></p> <p>P Dog walking on hot surfa... Inquiry Graphic Organizer ■ Help for the Doggie paw...</p> <p>Tell students the story of Genesis trying to walk her dog on the hot asphalt.</p> <p>Genesis took her dog for a walk on a hot summer day. When the pup stepped on the black asphalt, he yelped! It was too hot. She got booties to protect his feet, but he doesn't like to wear them. <i>What can Genesis do?</i></p> <p>Have students brainstorm in pairs answers to the following questions:</p>	<p>Introduce the Driving Question:</p> <p>Have students review the driving question: <i>What materials can be used to make surfaces cooler?</i></p> <p>Use the strategy to support students with making connections and understanding the driving question (DQ).</p> <p>Visualizing the Driving Question</p> <p>Click here to access question words reference chart</p> <p>The process can be recorded on chart paper with the students or the teacher can complete the graphic organizer.</p> <p>Be sure to create a reference for students to have throughout the week.</p> <p>**Teacher Note: Students should not answer the driving question at this time. Students will need to collect information, data and understanding from the phenomenon strategy, inquiry activity, investigation, text or video protocol and vocabulary strategy to develop a response in the claim-evidence-reasoning format.</p> <p>(3-5 teachers and students should focus on developing claim, evidence, and reasoning)</p>	<p>Graphic Organizer</p> <p>■ What's Getting Hotter In...</p> <p>Inquiry Activity What gets hotter?</p> <p>Objective: TSW brainstorms materials and surfaces that are cooler to walk on.</p> <p>Materials Thermometer Clear Plastic bags soil water rocks grass</p> <p>TTW ask students: <i>The owner walked her dog on the sidewalk, but what are some other places we can find black asphalt?</i></p> <p><i>Does black asphalt exist everywhere on Earth?</i></p> <p><i>What are some other things that cover the Earth's surface?</i></p> <p><i>Possible answers: water, dirt, rocks, etc.</i></p> <p>Once the students provide examples, ask, <i>"Do you think the sun heats up all materials in the same way?"</i> Have students explain their reasoning.</p> <p>Ask students to choose different materials to place in bags exposed to sunlight, and suggest having comparison bags</p>	<p>Text Annotation Strategy</p> <p>Have students read and annotate the following text: Have students read and annotate the following text: ■ Fun in the Sun.pdf</p> <p>The text for this week's lesson can be found on Epic: Link:https://www.getepic.com/app/search</p> <p>The teacher should facilitate the following process. Have the students follow the text protocol facilitation directions provided in the following strategy:</p> <p>■ 3-5 Text Annotation Prot...</p> <p>Students should complete the following student handout as they work through the text annotation protocol:</p> <p>3-5 Information Analysis Student Organizer (editable)</p> <p>■ 3-5 Information Analysis...</p> <p>During the teacher-led discussion, the teacher should ask the following questions: <i>How is heat transferred from the sun?</i> <i>How did the solar oven receive heat from its heat source?</i></p> <p>**TEACHER NOTE: Read and</p>	<p>Claim-Evidence-Reasoning</p> <p>Students will write a response to the following driving question in the CER format. <i>What materials can be used to make the surfaces cooler?</i></p> <p>Review the claim-evidence-reasoning poster with the students</p> <p>**TEACHER NOTE: Provide students with sentence starters by sharing on the board:</p> <p>■ 3-5 Claim-Evidence-Rea...</p> <p>Have students write their claim-evidence-reasoning</p> <p>writing a claim Have students develop a claim which is their answer to the driving question, claim. Students should use all their knowledge from the phenomenon, inquiry activity, investigation, and information analysis protocol to develop an answer to the question.</p> <p>writing evidence Students should provide observational or numerical data as their evidence from their investigation and write a short caption or brief description of the data they provide to support their claim.</p>

Why is the black asphalt hot?

Do you think black asphalt is hotter than the air?

In addition to the booties, what else could Genesis do to protect her puppy's feet?

Materials:

[Dog walking on hot surface picture](#)

Chart Paper
Graphic Organizer

****TEACHER NOTE:**

Teacher will follow the procedure above and chart responses on Chart Paper from the questions above. Students will complete their responses on the inquiry graphic organizer. Activity can be found in Literacy-Based Science Task: Sunlight Effects from Inspire Science 3rd grade Activity 1.

Claim-Evidence-Reasoning (CER)

Objective: Expose students to claim-evidence-reasoning (CER) student samples below to review and understand their peers' thoughts on the topic, initiating the process of developing skills for effective argumentation.

The teacher should state the following to students:

“Claim-Evidence-Reasoning or CER is a way of writing that helps students understand and explain what they learn in science investigations and science ideas.”

Review the [claim-evidence-reasoning poster](#) with students.

As a class or in student groups, provide students with this week's claim-evidence-reasoning sample.

[The teacher will pull students samples from earlier in the unit for peer review. Be sure to hide student names.](#)

The teacher or students should read over student sample(s) to analyze claim-evidence-reasoning protocol. Ask students to use the CER observations chart to complete the following analysis protocol:

(controls) in the shade. Let small groups decide which materials to test, including any reasonable proposals not originally prepared. Ensure groups complete their investigation plan before setting up. Emphasize keeping conditions fair between bags, like measuring equal amounts of materials and exposing them to equal sunlight. Allow bags to sit outside for at least 45 minutes for clear results. Review how to use a thermometer to measure and record temperatures in Celsius and Fahrenheit.

****TEACHER NOTE:**

Before class, identify places in your school yard (or on a windowsill in your room) that will be sunny or shady during the time that you want to conduct this investigation. Gather or locate plastic baggies, thermometers, and test materials such as damp dirt, gravel, paper clips (to represent a metal surface), aluminum foil, water, sand, handfuls of grass, etc.

review the annotation protocol prior to providing this lesson to students. Students will need to be placed in groups or have an understanding of how the groups will change to limit time used for transitioning.

Vocabulary Strategy

Vocabulary Words:

Initial
concentrate
inquisitive
investigation

Vocabulary Terms Chart

Provide students with the [graphic organizer \(editable\)](#) or [pdf handout](#), explaining its sections: word, *What did it look like in the investigation?*, meaning, image/drawing, connection

Use a Think Aloud to demonstrate how to use the graphic organizer with one of the provided vocabulary words. The teacher should provide the meaning of the word to the students and ask students to provide examples of how the word was represented during the investigation, phenomenon and/or inquiry activity. In the connection column, students should write how the word connects to concepts or observations they gathered during their classroom tasks. Allow students to work in collaborative groups. Actively monitor and facilitate small group discussions and review various artifacts (pictures, images, primary sources, charts) to build knowledge of the term.

writing the reasoning

Students will use textual evidence from the “text annotation graphic organizer” to generate the reasoning or justification in the CER format.

Have students use the following template to write their claim-evidence-reasoning (CER)

[3-5 Student Writing Template \(editable\)](#)

[3-5 Student Writing Template \(pdf\)](#)

****TEACHER NOTE:** Have students review the student sample(s) of claim-evidence-reasoning on Day 2. Have students compare their writing to those students' samples. Ask the following questions:

How are your thoughts or understanding similar to another writer on the topic?
How are your thoughts or understanding different to another writer on the topic?
What would you like to learn more about? Why?

Assessment for Learning:

Illuminate test for week 6 at CCPS 3rd Science Unit 3 Heat Energy Week 6 Assessment Illuminate

Teacher Copy:

■ [CCPS 3rd Science Unit 3...](#)

Student Copy:

■ [CCPS 3rd Science Unit 3...](#)

[Claim-Evidence-Reasoning Record Observations Document](#)

(google doc)

[Claim-Evidence-Reasoning Record Observations Document](#) (PDF)

1. Identify the student's claim in the sample and have the teacher or students write their observations or questions.

2. Identify the student's evidence in the sample and have the teacher or students write their observations or questions.

3. Identify the student's reasoning in the sample and have the teacher or students write their observations or questions.

Ask the following questions to students as they analyze the student samples:

+

[Claim-Evidence-Reasoning Record Observations Document](#)

****Teacher Note:** As students review the student samples, they will begin to see or read vocabulary. Begin or continue a reference chart of questions or observations about vocabulary. Students will explicitly learn vocabulary on Day 4.

Have students collaborate, in groups, to complete the vocabulary terms chart for the other vocabulary terms.

Allow groups to share their thinking through academic dialogue and compare their completed task with members of other groups.

Assessment Prep (5-7 Minutes)

Assessment Prep

Prepare students for assessment by reviewing the following Assessment Prep Presentation.

Provide the following guidance:

Ask the students to use what they know about the tasks completed to answer the provided assessment prep question.

- What is the question asking you?
- What do you know about the vocabulary or concept in the question?
- Is this question similar to any investigations or tasks we've completed?
- How can what you've done help you answer this question?
- Just view the assessment question: What is the question asking you?

Guide students to think about how their experience connects to the question.

Using the answer choices provided, ask the students the following:

- Identify a wrong answer: How do I know this answer is incorrect?
- Identify the right answer: How do we know this answer is correct?

Allow the students time to discuss in collaborative groups.

TEACHER NOTE: If students struggle with the question, review it the next day. Do not rush to the next question; instructional time is the only time they have to prepare for the end-of-year assessment.

Labs / Investigations

Mandatory Labs	Gizmo	Mystery Science
Inventing a Heat Engine How Does Sunlight affect different Materials How Does Sunlight affect the temperature of Objects		How long did it take to travel across the country before cars and planes?

Additional- Resources/Tasks

Supplemental Labs	What's Getting Hotter? Producing Heat Energy Solar Oven Producing Heat Sources Collage
Culminating Performance Task	<i>What are some different sources of heat energy? CER task</i> <i>What is making the chimes spin? CER task</i> <i>What materials can be used to make the surfaces cooler? CER task</i>
STEM Activities	Keeping Chickens Warm-ADI

**Guidance
Document**

Link the following : https://drive.google.com/file/d/1dDFitw1NesctodMZ9XAr7zc0-S5GZKPB/view?usp=drive_link