

CCPS Science Unit Plan

Grade	1st	Subject	Science	Unit #	3
Unit Name	Unit 3: Light		Timeline	6 weeks November 4th - December 20th	
How to use the Framework	<p>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>Please see the hyperlinked abbreviation document to ensure understanding of all abbreviations used with this framework.</p> <p>CCPS Department of Science Website for access to all unit frameworks.</p>				
Unit Overview	<p>Background Information: Light is a form of energy that we encounter in everyday life. Light can be emitted from various sources, and objects can be seen if the light is available to illuminate them or if they give off their own light. Shadows occur when objects block light.</p> <p>Prerequisites:</p> <p>By the end of this unit, the student should understand:</p> <ul style="list-style-type: none"> Light is required to make an object visible in an environment with no light <p>By the end of this unit the student should:</p> <ul style="list-style-type: none"> Encounter vocabulary words that build core understanding Have experience using light to make objects visible Make observations from direct exploration Support the idea that light causes objects to be visible <p>■ Science-1st-Teacher-Notes.pdf</p>				
Lesson Plan guidance document and template	<p>Link the following : https://drive.google.com/file/d/1dDFitw1NesctodMZ9XAr7zc0-S5GZKPB/view?usp=drive_link</p> <p>■ Copy of Department of Science CCPS Lesson Plan Guidance Document .pdf</p>				
Standards	<u>GSE</u>		<u>Science and Engineering Practices</u>		<u>Crosscutting Concepts</u>
	<p>S1P1 : Obtain, evaluate, and communicate information to investigate light and sound.</p> <p>a. Use observations to construct an explanation of how light is required to make objects visible.</p>		<p>Planning and Carrying Out Investigations to answer questions or test solutions to problems in K - 2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or designs solutions.</p>		<p>Cause and Effect – Simple tests can be designed to gather evidence to support or refute student ideas about causes.</p>

	<p>b. Ask questions to identify and compare sources of light.</p> <p>c. Plan and carry out an investigation of shadows by placing objects at various points from a source of light.</p> <p>e. Design a signal that can serve as an emergency alert using light and/or sound to communicate over a distance.</p>	<p>Constructing Explanations and Designing Solutions in K-12 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomenon and designing solutions.</p>	
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NGSS Alignment	<p>NGSS Alignment to Disciplinary Core Ideas</p> <p>1-PS4-2 : Make observations to construction evidence-based account that objects can be illuminated.</p> <p>1-PS4-3 : Plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam light.</p> <p>1-PS4-4 : Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.</p>
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The Phenomenon Protocol

Anchoring Phenomena	Learning Targets
S1P1a - Why can't I see what is inside the gift boxes?	The students will use observations to construct explanations about how light is required to make objects appear visible.
S1P1b - What produces light?	The students will identify and compare sources of light by asking questions.
S1P1c - How can you use light to produce a shadow?	The students will plan and carry out an investigation of shadows by placing objects at various points from a light source.
S1P1e - How can I design a signal/device using light to communicate over a distance?	The students will design a signal that can serve as an emergency alert using light to communicate over a distance.

Weekly Lesson Tasks

Whole Group: SAVVAS
Small Group: Discovery Education: Mystery Science, Explore Learning, GaDOE Inspire Tasks, SAVVAS Leveled Readers

Week 1	
GSE: S1P1a	Focused Concept: Objects can be seen if a light is available to illuminate them or if they give off

their own light. Natural light includes fires, fireflies, and glow sticks. Artificial sources of light include flashlights, lamps, and cell phones.

Learning Target:




I can observe that light is needed to see an object and identify objects that give off light.

Lab Safety and Materials:

W General Safety Practices for the Elementary Science Classroom- TOC.docx
Do not shine flash light in others eyes. (flashlight, toy, white board)

Phenomenon:  **SIP1a.projectable.PNG**

DQ: How can I observe light and identify objects that give off light?

Day 1: Opening	Day 2 : Guided Practice/ Transition	Day 3: Independent Practice	Day 4: Independent Practice	Day 5: Assessment / Summary
<p>Anchoring Phenomenon: (5-7 minutes)</p> <p> SIP1a.projectable.PNG Use the see, think wonder strategy to guide student thinking.</p> <p>**TEACHER NOTE** 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 (10-15 minutes)</p> <p>SEP Teacher Tip: 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</p>	<p>Introduce the Driving Question: (7-10 minutes)</p> <p><i>How can I observe light and identify objects that give off light?</i></p> <p>Have students review the driving questions: <i>How can I observe light and identify objects that give off light?</i></p> <p>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</p>	<p>Review the Driving Question: (2-3 minutes)</p> <p><i>How can I observe light and identify objects that give off light?</i></p> <p>Investigation Facilitation (35-40 minutes)</p> <p>SEP Teacher Tip: 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 uInvestigate Lab:What happens when an object blocks the light? SAVVAS - T.E. pg.43 Have students follow the procedure provided in the lab.</p>	<p>Text Annotation Strategy (30-45 minutes)</p> <p>Have students read and annotate the following text:</p> <ul style="list-style-type: none"> • Light and Darkness • Where Light Comes From <p>**TEACHER NOTE: As you read with your students, read through the Scaffolded Questions, Reading Check and Possible Misconceptions SAVAAS T.E. pg 44 - 46</p> <p>Before reading, prompt students by asking the question : <i>What can you see without light?</i></p> <p>The teacher should facilitate the following process. Have the students follow the text protocol facilitation directions provided in the following strategy:  K-2 Text Annotation Prot... Students should complete the following student handout as they work through the text</p>	<p>Claim-Evidence-Reasoning (15-25 minutes)</p> <p>Students will write a response to the following driving question in the CER format.</p> <p><i>How can I observe light and identify objects that give off light?</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:  K-2 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. Students should use all their knowledge from the phenomenon, inquiry activity, investigation, and information analysis protocol to</p>

[Student back pocket questions](#)

uConnect Lab: [What do you need to see objects?](#)

Objective: Students will make an observation and construct evidence based accounts that light is needed to see objects that do not make their own light.

****TEACHER NOTE****

Read through **Advanced Preparation** and **What to Expect**.

SAVAAS T.E. pg.40

Have students follow the procedure provided in the lab.

Inquiry Activity (Second Option):

Science 4 Us: Light

Student Materials:

Student Science Journals

■ **Science 4 Us Light Engage...**

****Teacher Note:**

Follow Guided Instructions Overview:

1. **Introduce the online Engage activity to students, and identify the objective.**
2. **Initiate the online activity and complete the first Notebook prompt.**
3. **Show the animated video portion of the online activity.**
4. **Complete the second Notebook prompt.**
5. **Facilitate a conversation using the discussion prompts**

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.

Claim-Evidence-Reasoning (CER)
(10-12 minutes)

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.

Objective: Students will investigate how an object blocks light differently depending on its distance from a light. .

Graphic Organizer:

uInvestigate Lab : [What happens when objects block light?](#)

Students will need and will use the student lab sheet for provided in their consumable book or the access to the activity sheet:

Materials
flashlight
toy
white board

****TEACHER NOTE****

Students will observe that a shadow forms when the toy is placed in front of the light. They should place the poster board so that the toy is between the light and board to make a shadow. Students will observe that the shadow is larger when the object is close to the light.

annotation protocol:

[K-2 Text Annotation Student Document \(editable\)](#)

■ **K-2 Text Annotation Stu...**

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

What do you need to see an object?

Why do some people keep a light on at night?

What is necessary for an object to be seen?

****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
(10-15 minutes)

Vocabulary Words:

light
shadow
block
darkness

ONLY PICK ONE OF THE STRATEGIES BELOW

Vocabulary Strategy:
Four Square

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

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.

****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?

(and hints) that follow the second notebook prompt.

1. Light Stud Samples.pdf

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-Reason... (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-Reason...

****TEACHER NOTE****

As students review the student samples, they will begin to see or read vocabulary. Begin or

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.

continue a reference chart of questions or observations about vocabulary. Students will explicitly learn vocabulary on Day 4.

Week 2

GSE: S1P1a

Focused Concept: Objects can be seen if a light is available to illuminate them or if they give off their own light. Natural light includes fires, fireflies, and glow sticks. Artificial sources of light include flashlights, lamps, and cell phones.

Learning Targets:

I can describe how light interacts with different materials.

Lab Safety and Materials:

W **General Safety Practices for the Elementary Science Classroom- TOC.docx**
Do not shine a flashlight in your eyes or others. (flashlight, clear plastic, waxed paper, and cardboard)

Phenomenon: **S1P1a.projectable.PNG**

DQ: Why can't I see what is inside the gift boxes?

Day 1: Opening	Day 2 : Guided Practice/ Transition	Day 3: Independent Practice	Day 4: Independent Practice	Day 5: Assessment / Summary
<p>Anchoring Phenomenon: (5-7 minutes)</p> <p>S1P1a.projectable.PNG</p> <p>See, Think, Wonder.pdf Use the see, think wonder strategy to guide student thinking.</p> <p>**TEACHER NOTE** 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 (10-15 minutes)</p>	<p>Introduce the Driving Question: (7-10 minutes) <i>Why can't I see what is inside the gift boxes?</i></p> <p>Have students review the driving questions: <i>Why can't I see what is inside the gift boxes?</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>Review the Driving Question: (2-3 minutes) <i>Why can't I see what is inside the gift boxes?</i></p> <p>Investigation Facilitation (35-40 minutes)</p> <p>SEP Teacher Tip:</p> <p>To support students with the science and engineering practices for this week, follow the guidance in this protocol:</p> <p>Developing model construction questions</p> <p>Provide constructive feedback for building a model</p>	<p>Text Annotation Strategy (30-45 minutes)</p> <p>Have students read and annotate the following text:</p> <ul style="list-style-type: none"> • Blocked Light • Light Goes Through • Light Bounces Off • Materials That Reflect <p>**TEACHER NOTE: The teacher should be signed in to SAVVAS Realize to access the link above. The links will be separated by headers. However, this will be one text available to the students. Use the links above to help navigate to the text for this week.</p>	<p>Claim-Evidence-Reasoning (15-25 minutes)</p> <p>Students will write a response to the following driving question in the CER format.</p> <p><i>Why can't I see what is inside the gift boxes?</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: S1P1a.Claim-Evidence-Reasoning</p> <p>Have students write their claim-evidence-reasoning</p>

SEP Teacher Tip:

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](#)

Jumpstart Discovery:

Use Jumpstart Discovery prompt on

SAVVAS Light & Matter : pg. 48.

TEACHER NOTE

follow facilitation instructions and also use **ELD Support**

Activity

SAVVAS T.E pg. 48

Students will observe light through their fingers and a white sheet of paper and compare their observations. Teachers will facilitate instruction by telling students to describe what they see. (have students describe in the terms of using light and dark) Students will write a sentence comparing their observations.

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.

Claim-Evidence-Reasoning (CER)

(10-12 minutes)

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

[Student back pocket questions](#)

uInvestigate Lab: How do materials affect light?

SAVVAS - T.E. pg.49

Have students follow the procedure provided in the lab.

Objective: Students will plan and conduct an investigation to recognize that different materials allow more light to get through others.

Graphic Organizer

uInvestigate Lab : [How do materials affect light?](#)

Students will need and use the student lab sheet provided in their consumable book or the access to the activity sheet.

TEACHER NOTE

The teacher will caution the students not to shine the flashlight directly to their own or other students' eyes.

Materials

flashlight
clear plastic
waxed paper
cardboard

TEACHER NOTE

Students will recognize that the plastic lets most of the light through. The waxed paper blocks some light, and the cardboard blocks all light. They will identify the most appropriate of these materials for a specific use.

TEACHER NOTE

As you read with your students, read through the **Scaffolded Question, Critique, Reading Check (Cause and Effect), Possible Misconceptions, and Literacy Toolbox.**

SAVVAS T.E. pg 50-53

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

■ K-2 Text Annotation Prot...

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

[K-2 Text Annotation Student Document \(editable\)](#)

■ K-2 Text Annotation Stu...

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

Describe how light travels.

Which material reflects light, a piece of aluminum foil or a piece of T-shirt cloth? How do you know?

What is the effect of light shining on a smooth shiny surface?

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

[Writing a claim](#)

Have students develop a claim which is their answer to the driving question. 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.

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?

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

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

■ [2. Light Stud Samples.pdf](#)

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:

■ Claim-Evidence-Reasoni...

the groups will change to limit time used for transitioning.

Vocabulary Strategy

Vocabulary Words:

opaque
transparent
translucent
reflect

ONLY PICK ONE OF THE STRATEGIES BELOW

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.

****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.

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

Week 3

GSE: S1P1b

Focused Concept: Light can be emitted from a variety of sources, including the sun and other stars, fires, lightbulbs, and some organisms.

Learning Targets:

I can describe how light interacts with different materials.

Lab Safety and Materials:

[W General Safety Practices for the Elementary Science Classroom- TOC.docx](#)
Be careful when handling all light sources (flashlight, light bulb/lamp, glow stick, candles)

Phenomenon: [S1P1b.projectable.PNG](#)

DQ: What produces light?

Day 1: Opening

**Day 2 : Guided Practice/
Transition**

Day 3: Independent Practice

Day 4: Independent Practice

Day 5: Assessment / Summary

Anchoring Phenomenon:
(5-7 minutes)

[S1P1b.projectable.PNG](#)
Use the [see, think wonder strategy](#) to guide student thinking.
****TEACHER NOTE****
provide students opportunities to share observations and develop questions. The teacher should record students' observations on chart paper and refer back to initial student

Introduce the Driving Question:
(7-10 minutes)

What produces light?

Have students review the driving questions:
What produces light?

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

Review the Driving Question:
(2-3 minutes)

What produces light?

Investigation Facilitation

SEP Teacher Tip:

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

[Developing model construction](#)

Text Annotation Strategy

Have students read and annotate the following text:
[Light Helps Us See - \(Student Handout\)](#)

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

[K-2 Text Annotation Prot...](#)

Claim-Evidence-Reasoning

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

What produces light?

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

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

ideas throughout the week.

Inquiry Activity (10-15 minutes)

SEP Teacher Tip:

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](#)

[Can you see in the dark?](#)
(Exploration)

[Can you see in the dark?](#)
(Hands On Activity)

Teachers will have students describe how much light they need to see the message clearly and if there is anything they can do to let more light into the box.

****TEACHER NOTE****

Prior to students engaging in the hands on **Dark Box** activity the teacher will review the instructions.

[Can you see in the dark?](#)
(Instructions)

[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.

Claim-Evidence-Reasoning (CER) (10-12 minutes)

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

[questions](#)

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

[Student back pocket questions](#)

Exploring Lights

■ Exploring Light and Shado...
(Instructions)

[Forms of Light Cards](#)

Graphic Organizer

■ Forms of Light _ Comparin...
(PDF)

■ Forms of Light / Comparing...
(Editable)

Materials

forms of light cards
student handouts
flashlight
lightbulb/lamp
glow stick
candle

****TEACHER NOTE****

There are two parts to this activity. Teachers can project "forms of light" cards for students.

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

[K-2 Text Annotation Student Document \(editable\)](#)

■ K-2 Text Annotation Stu...

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

What is something light can pass through?

What is something that light cannot pass through?

What two things can happen when light shines on it?

Why can't light pass through dogs and trees?

****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:

artificial light
natural light

ONLY PICK ONE OF THE STRATEGIES BELOW

Vocabulary Strategy:

Four Square

Provide students with the

■ K-2 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. 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.

****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?

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.

■ 3. Light Stud Samples...

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-Reas... (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

[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.

What would you like to learn more about? Why?

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-Reas...

****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 4

GSE: S1P1c

Focused Concept: Shadows occur when objects block light. The shadow is determined by the distance between the light source and the object. A shorter distance creates a larger, darker shadow while a longer distance creates a smaller light shadow.

Learning Targets:

I can determine how light changes shadows.




Lab Safety and Materials:

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

Be careful when handling all light sources (flashlight, light bulb/lamp, glow stick, candles)

Phenomenon:  **S1P1c.projectable.PNG**

DQ: How can you use light to change a shadow?

Day 1: Opening	Day 2 : Guided Practice/ Transition	Day 3: Independent Practice	Day 4: Independent Practice	Day 5: Assessment / Summary
<p>Anchoring Phenomenon:  Use the see, think wonder strategy to guide student thinking.</p> <p>**TEACHER NOTE** 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>SEP Teacher Tip: To support students with the science and engineering practices for this week, follow the guidance in this protocol:</p> <p>Developing model construction questions</p> <p>Provide constructive feedback for building a model</p> <p>Student back pocket questions</p> <p>Light/Shadows Teacher Instructions</p> <p>**TEACHER NOTE** This activity will provide students a chance to explore the importance of light through drawing.</p> <p>Graphic Organizer Students will fold paper into three sections (trifold style)</p>	<p>Introduce the Driving Question: <i>How can you use light to change a shadow?</i></p> <p>Have students review the driving questions: <i>How can you use light to change a shadow?</i> 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>Claim-Evidence-Reasoning (CER)</p>	<p>Review the Driving Question: <i>How can you use light to change a shadow?</i></p> <p>Investigation Facilitation</p> <p>SEP Teacher Tip: To support students with the science and engineering practices for this week, follow the guidance in this protocol:</p> <p>Developing model construction questions</p> <p>Provide constructive feedback for building a model</p> <p>Student back pocket questions</p> <p>Changing Shadows (Instructions)</p> <p>Objective: Students will observe the shadows as they hold a flashlight at various positions and compare it to a shadow that a glow stick creates.</p> <p>Graphic Organizer Changing Shadows - Student Handout</p> <p>Materials Handout (per student) flashlight (per group) glow stick (per group) pencil (per student) chart paper (teacher) chart marker (teacher)</p> <p>**TEACHER NOTE:</p>	<p>Text Annotation Strategy</p> <p>Have students listen to the EPIC read and annotate the following text: How We Get Light and Why It's Important</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></p> <p>Students should complete the following student handout as they work through the text annotation protocol:</p> <p>K-2 Text Annotation Student Document (editable) </p> <p>During the teacher-led discussion, the teacher should ask the following questions:</p> <p><i>What would happen to plants, animals and people if we lived in the dark all the time?</i></p> <p><i>Why is the Sun our main source of light?</i></p> <p><i>How are shadows made?</i></p> <p><i>What kind of light source is the Sun?</i></p> <p>**TEACHER NOTE: Read and review the annotation protocol prior to providing this lesson to students. Students will need to</p>	<p>Claim-Evidence-Reasoning</p> <p>Students will write a response to the following driving question in the CER format.</p> <p><i>How can you use light to change a shadow?</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>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. 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> <p>Writing the reasoning Students will use textual evidence from the “text</p>

have students label their papers (**lights on, lights off, glow light**)

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.

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

Students will observe how shadows change. Students will first investigate by moving the light source into different positions and observe how the shadow changes. Then students will investigate by keeping the light source still and moving the object. Students should conclude that the glow stick emits less light and decide to use the flashlight.

Facilitate classroom discussion with the following questions:

What did you see when we used the classroom lights?

How are the classroom lights different from the flashlight and the glow stick?

Where did you see your shadow when we used the flashlight?

Where was your shadow when we used the glow stick?

Is your shadow taller or shorter than the toy figure?

How can you make your shadow shorter? How about longer?

be placed in groups or have an understanding of how the groups will change to limit time used for transitioning.

Vocabulary Strategy

Vocabulary Words:

shadow
reflect
light
block

ONLY PICK ONE OF THE STRATEGIES BELOW

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

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?

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-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.

non-essential characteristics.

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

Week 5

GSE: S1P1e

Focused Concept: People use a variety of devices to rely on light to communicate over long distances.

Learning Target:

I can communicate over a long distance using light signals.

Lab Safety:

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

Be careful when handling all light sources (flashlight, light bulb/lamp, glow stick, candles)

Phenomenon: 				DQ: How can light signals help communicate over a distance?
Day 1: Opening	Day 2 : Guided Practice/ Transition	Day 3: Independent Practice	Day 4: Independent Practice	Day 5: Assessment / Summary
<p>Anchoring Phenomenon: </p> <p>**TEACHER NOTE** 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>SEP Teacher Tip: 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 How could you send a secret message to someone far away? (Exploration)</p> <p>**TEACHER NOTE** Teacher will start exploration on slide 2.</p> <p> How could you send a se... (Instructions)</p>	<p>Introduce the Driving Question: <i>How can light signals help communicate over a distance?</i></p> <p>Have students review the driving questions: <i>How can light signals help communicate over a distance?</i></p> <p>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</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</p>	<p>Review the Driving Question: <i>How can light signals help communicate over a distance?</i></p> <p>Investigation Facilitation</p> <p>SEP Teacher Tip: 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</p> <p>Facilitate classroom discussion with students, prompt their thinking by asking : <i>If we were to lose power, how would we see objects?</i></p> <p>Objective: Students will share out a time when they had no power and what they used to light up</p> <p>Graphic Organizer Light Signal - student handout</p> <p>Students will need and will use the student lab sheet for provided in their consumable book or the access to the</p>	<p>Text Annotation Strategy</p> <p>Have students read and annotate the following text: Making the Streets Safer</p> <p>**TEACHER NOTE** Text can be found on ReadWorks - https://www.readworks.org/</p> <p>The teacher should facilitate the following process. Have the students follow the text protocol facilitation directions provided in the following strategy:  K-2 Text Annotation Prot...</p> <p>Students should complete the following student handout as they work through the text annotation protocol: K-2 Text Annotation Student Document (editable)  K-2 Text Annotation Stu...</p> <p>During the teacher-led discussion, the teacher should ask the following questions:</p> <p><i>How did the traffic light help people?</i></p> <p><i>How do light signals help us communicate with one another?</i></p> <p><i>What are some other ways we could use light to communicate</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>How can light signals help communicate over a distance?</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:  K-2 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. 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>

[How could you send a secret message to someone far away?](#)
(Hands On Activity)

[How could you send a secret message to someone far away?](#)
(Wrap Up Activity)

Objective: Students will use light to communicate information. Students will work in pairs to create a device that communicates over a distance.

Graphic Organizer

■ **Color Codes - activity sheet**
(PDF)

format.

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.

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)

activity sheet:

Materials
student handout

****TEACHER NOTE:**
Read through rubric with students for understanding of expectations.

over a distance?

****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:

emergency signal
light
visible
communicate

ONLY PICK ONE OF THE STRATEGIES BELOW

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

Writing the reasoning

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?

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:

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.

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.

Week 6

GSE: S1P1a.b.c

Focused Concept: Light is a form of energy we encounter every day.

Learning Target:

I can design a device to communicate light over a long distance.

Phenomenon: [SIP1e.projectable.PNG](#)

DQ: How can I design a signal/device using light to communicate over a distance?

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

strategy to develop a response in the claim-evidence-reasoning format.

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.

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](#)

Students will need and will use the student lab sheet provided in their consumable book or the access to the activity sheet:

Materials

flashlight
½ cup of water in a clear plastic cup
1 cup of milk

What do you think it would be like without any light?

****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:

electricity
energy

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

[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:

■ 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.

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.

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	Explore Learning	Mystery Science
SAVVAS: What happens when objects block light? SAVVAS : How do materials affect light? Exploring Light : Lights and Shadows Exploring Light : Changing Shadows Exploring Light : Light Signal SAVVAS : How can I change a transparent material?	Science 4 Us: Light ■ Science 4 Us Light Engage.pdf	Mystery Science: Light and Illumination Mystery Science: Light, Communication, and Engineering

Additional- Resources/Tasks

Supplemental Labs	SAVVAS Interactives Light Helps Us See Shine Light On Matter Light Keeps Us Safe
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Culminating Performance Task	CER <i>How can I observe light and identify objects that give off light?</i> CER <i>Why can't I see what is inside the gift boxes?</i> CER <i>What produces light?</i> CER <i>How can you use light to change a shadow?</i> CER <i>How can light signals help communicate over a distance?</i> CER <i>How can I design a signal/device using light to communicate over a distance?</i>
STEM Activities	SAVVAS uDemonstrate Lab - How can I change a transparent material?