**Essential Question:** Do you need light to see?

**1-PS4-2** Make observations to construct an evidence-based account that objects in darkness can be seen only when illuminated

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| **Lesson Component** |
| **Engage:** (gain attention, activate prior knowledge, pose relevant question)Lesson 1: Articulating the explanation of phenomena* Class discussion about light versus dark-how is it different? What do you notice? (turning off lights)
* Record on KLEWS Chart
* [**Discovery Education:** Sid the Science Kid – Light Shirt (video segment. START AT :46 – 2:20.](https://app.discoveryeducation.com/learn/videos/6136e2c2-f3a3-4046-902d-33d42f807c7b?hasLocalHost=true)
* DO NOT PLAY THE BEGINNING OR ENDING OF VIDEO, AS IT WILL GIVE AWAY THE CONCEPT
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| **Explore:** (use science and engineering practices to investigate the relevant question)* [Light and Dark](http://www.bbc.co.uk/schools/scienceclips/ages/5_6/light_dark_fs.shtml) interactive activity
* [Spooky Mansion](http://www.bbc.co.uk/bitesize/ks1/science/light/play/) interactive activity
* Sorting picture cards that can and cannot illuminate light (resource is found on PowerPoint). Different from Light Source Sort center activity. Discuss as a class. Example: coins, water, the moon & mirrors are not really sources of light, as they only reflect light from true sources.

Lesson 2: Evidence & Reasoning* Dark Room
* Use shapes in different colored paper and aluminum foil to have students sort what they will be able to see in the light and what they will be able to see in the dark. (See Slide 16 for Recording Sheet)
* Create a dark area (could be the entire room i.e. closing blinds, covering windows, etc.) to test if students can see the shapes in the dark room with and without a flashlight.
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| **Explain:** (help students organize ideas, add ideas, and attach vocabulary)* Record findings from the Pin Hole Box OR Dark Room OR Kaleidoscope investigations on the KLEWS Chart
* Read [Day Light, Night Light](https://www.youtube.com/watch?v=aYWAq2GfI8Y)- Franklyn M. Branley
* [Epic books](https://www.getepic.com/app/account_select) (free on-line account for teachers. Can be assigned to students in reading centers)
* Light: First Science by Maria Schuh (skip pg 11; 14- 19 – used in 1-PS4-3) \*USE pgs 20-21 in particular\* (F&P level “M”)
* Light Helps Me See by Jennifer Boothroyd (F&P level “F”)
* The Energy We See: A Look at Light by Jennifer Boothroyd (F&P level “M”) \*Use pgs 1 – 20 only\*
* [Why can't we see in the dark?](http://safeshare.tv/v/ss578e617aa19e1) (video)
* [Discovery Education: The Magic School Bus gets a Bright Idea](https://app.discoveryeducation.com/learn/videos/c6dbfc2c-1fd0-40ff-a847-effe03d0a673?hasLocalHost=true)

Introduce Vocabulary:* artificial light (make an anchor chart – students provide real world examples)
* illuminate
* natural light (make an anchor chart – students provide real world examples)
* visible
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| **Elaborate:** (provide additional examples and non-examples, clarify details)* Word Illumination: Provide students with cardboard, scissors and a flashlight, masking tape. Students can write one word on the last piece of cardboard. Students will stand the cardboard pieces vertically in a line and use materials to illuminate the word at the end of the line. (photograph on PowerPoint)
* Brainpop [Light](http://www.brainpop.com/science/energy/light) *(optional activity if your school has a Brainpop Jr. subscription)*
* Light is All Around Us-Wendy Pfeffer- Read and discuss this book.
* [The Dark](https://www.youtube.com/watch?v=H7pEjljjH0w)-Lemony Snicket- Read and discuss this book.
* Journal entries for Pinhole OR Dark Room OR Kaleidoscope investigations (Center Activity)
* Writing/Journal Prompt: *In the Dark* You and your friend are in a room with no windows. The lights go out! What are some things you could use to be able to see each other? Draw your ideas in your journal. Don’t forget to label them.

 (Center Activity)* Using old magazines, create a collage in your journal of examples of light – artificial and natural. (Center Activity)

**Center Activities:** * Journal entries
* Light source collage in journals
* Epic on-line books
* [Light Sources sort](https://wicboe-my.sharepoint.com/personal/gwiersbe_wcboe_org/Documents/First%20Grade%20Science/1G%20science%20curriculum%20resources/NGSS%20Physical%20Science/1-PS4-2%20LIGHT%20LESSONS/LIGHT%20SOURCES%20SORT.docx) – different pictures than ppt slides 11 – 12. Print and laminate pictures for students to use independently at a center.

 Optional Read-alouds:* [The Dark](https://www.youtube.com/watch?v=H7pEjljjH0w)-Lemony Snicket
* Light is All Around Us-Wendy Pfeffer
* One Small Square, The Night Sky-Donald Silver
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| **Evaluate:** (students demonstrate—to themselves—what they have learned)* Sorting picture cards that can and cannot illuminate light (resource is found on PowerPoint)- rubric on Performance Task list
* There is a separate Sorting Light Sources activity sheet that can be used for a grade.
* Students may record what happened during the Dark Room activity and why they think that happened.
* Bring students back to the KLEWS chart and have a discussion about what they’ve learned.
* Grade *In the Dark* journal entry.
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| **Cross Curricular Connections****Reading:**[CCSS.ELA-Literacy.W.1.1](http://www.corestandards.org/ELA-Literacy/W/1/1/)Students can write an opinion piece using what they have learned in the Day Light, Night Light book from Lesson 1 to explain why they think you can see certain colors in a dark room. [CCSS.ELA-Literacy.W.1.2](http://www.corestandards.org/ELA-Literacy/W/1/2/)Students can write about light and dark.[CCSS.ELA-Literacy.W.1.7](http://www.corestandards.org/ELA-Literacy/W/1/7/)Students will reflect on how they made observations in the dark in order to create a “how to” book on creating a dark room or a pin hole box.[CCSS.ELA-Literacy.W.1.8](http://www.corestandards.org/ELA-Literacy/W/1/8/)Students can use their background knowledge and experiences to gather information about light and dark.[CCSS.ELA-Literacy.SL.1.1](http://www.corestandards.org/ELA-Literacy/SL/1/1/)Students can discuss their observations within the Dark Room activity prior to journaling.[CCSS.ELA-Literacy.L.1.5.a](http://www.corestandards.org/ELA-Literacy/L/1/5/a/)[CCSS.ELA-Literacy.L.1.5.b](http://www.corestandards.org/ELA-Literacy/L/1/5/b/)Students can categorize and classify various pictures, items, objects, words, etc. (i.e. sort pictures by natural and artificial light).**Math:**[CCSS.Math.Content.1.NBT.B.2](http://www.corestandards.org/Math/Content/1/NBT/B/2/)Students can use a flashlight to shine the light on a given number described by another student in terms of tens and ones. (i.e. Shine the flash light on the number that has 8 tens and 12 ones)[CCSS.Math.Content.1.MD.B.3](http://www.corestandards.org/Math/Content/1/MD/B/3/)Students can relate “light” (day) and “dark” (night) by telling and writing time using analog and digital clocks. [CCSS.Math.Content.1.MD.C.4](http://www.corestandards.org/Math/Content/1/MD/C/4/)Students can create a class graph to answer the question, “Can you see if there is no light?” They will discuss the data.  Then students will look at a sample graph that the teacher will present as a different class’s graph. Students will interpret the data by answering questions like (the answer is four, what is the question?) The students will listen to a list of statements about the data and students will create their own graph. Clues can be provided (i.e. “Some said yes and some said no. More students said yes than no. The difference is \_\_\_,” etc.). Students can graph their predictions about which items they will still be able to see once they are in a dark room. [CCSS.Math.Content.1.G.A.1](http://www.corestandards.org/Math/Content/1/G/A/1/)[CCSS.Math.Content.1.G.A.2](http://www.corestandards.org/Math/Content/1/G/A/2/)Students can define, draw and compose two- and three-dimensional shapes. Students can use defining attributes to describe and find objects in the pin hole box. |