

# Unit Six: Light

Interdisciplinary Unit of Study

NYC DOE

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# I. Unit Snapshot

## Unit Topic:

Light

## Essential Question

How and why do we use different kinds of light?

## Focus Questions

- What kinds of lights are around us?
- What is darkness?
- How does light help us?
- What are shadows?

## Student Outcomes

Enduring understandings that the student should have by the end of the unit:

- There are many types of lights in our homes and our cities.
- Light helps us see and stay warm.
- Light helps plants grow.
- When there is little or no light it is dark.
- Shadows appear when an object blocks light.

## Connected Academic Vocabulary

This list should be adapted to fit the needs of individual programs and classrooms.

battery	nocturnal
blackout	opaque
candle	outline
clouds	parallel
curve	rainbow
dark	reflection
day	see
diurnal	shade
electricity	shadow
eyes	sight
eyesight	silhouette
fire	solar power
firefly	spiral
flame	stars
flashlight	straight
grow	street light
heat	sun
horizontal	sunglasses
lamp	traffic light
lantern	translucent
light	transparent
light bulb	vertical
lightning	wavy
lines	weather
melt	zigzag
mirror	
moon	
night	

## Focus Standards

### From the New York State Prekindergarten Learning Standards (NYSPLS)

#### Domain 1: Approaches to Learning

PK.AL.3. Approaches tasks and problems with creativity, imagination and/or willingness to try new experiences

#### Domain 2: Physical Development and Health

PK.PDH.1. Uses senses to assist and guide learning.

PK.PDH.3. Demonstrates coordination and control of large muscles

PK.PDH.9. Demonstrates awareness and understanding of safety rules

#### Domain 3: Social and Emotional Development

PK.SEL.2. Recognizes self as an individual having unique abilities, characteristics, feelings and interests

#### Domain 4: Communication, Language and Literacy

##### Approaches to Communication

PK.AC.4. Demonstrates a growing receptive vocabulary

##### English Language Arts and Literacy

###### Reading Foundations

PK.ELAL.1. [PKRF.1.] Demonstrates understanding of the organization and basic features of print

###### Reading

*PK.ELAL.5. [PKR.1.] Participates in discussions about a text (e.g., during whole or small group interactive read-aloud discussions, during peer sharing, within play scenarios)*

###### Speaking and Listening

PK.ELAL.25. [PKL.1] Demonstrates command of the conventions of academic English grammar and usage when writing or speaking.

*PK.ELAL.28. [PKL.5] Explores and discusses word relationships and word meanings*

#### Domain 5: Cognition and Knowledge of the World

##### Mathematics

PK.MATH.9. [NY-PK.OA.2.] Duplicates and extends simple patterns using concrete objects (e.g., what comes next?)

##### Science

PK.SCI.9. [P-PS3-1.] Participates in an investigation to determine the effect of sunlight on Earth's surface.

##### Social Studies

PK.SOC.5 Demonstrates knowledge of the relationship between people, places, and regions

##### The Arts

*PK.ARTS.14. [TH:Re7-9.PK] Responds to Theatrical Arts*

## II. Introduction

Welcome to Unit 6: Light, Pre-K for All's sixth Interdisciplinary Unit of Study. In Unit 6: Light, children move from exploring various modes and aspects of transportation to inquiring and thinking critically about light, darkness and shadows. This unit, like all Pre-K for All units, provides opportunities for children to observe objects and phenomena in their environment with increasing complexity. In this unit, children have the opportunity to deepen their understanding of natural and manufactured sources of light. Activities throughout the unit prompt children to explore light, darkness and shadows with hands-on materials as well as provide opportunities for children to make predictions and think about their world in increasingly abstract ways.

In Section IV: Ideas for Learning Centers, as well as throughout the unit, there are opportunities and examples of how children can use a light table (a flat panel or table that has a backlit surface) in combination with other objects. Many classrooms will not have a light table. See Section XI:

Appendices for information on creating a light table with recycled and/or easily attainable materials. We also recognize that in talking about light and shadow, children may ask questions about people who do not see clearly. Please see Section XI: Appendices, for some guidance on how to discuss this with children.

Most Interdisciplinary Units of Study are structured around four focus questions. Each focus question is designed to take about one week to explore. In the

Light unit, children begin by considering the first question, "What kinds of light are around us?" Children will observe, discuss and explore what they know about natural and manufactured light. In the second week, children will have learning experiences and explore activities that encourage them to think about darkness. In the third week, children focus on the question, "How does light help us?" They will continue to consider the how light affects our world, for example through conducting an experiment on growing plants in the light and in the dark. In the final week, children explore shadows by using flashlights and other light sources in the classroom as well as experimenting with shadows outside. Through these explorations, you are making science content and scientific thinking accessible and meaningful to children and building on their curiosity about science concepts. You are laying the foundation for continued scientific inquiry in Kindergarten and beyond.

As we explore light with prekindergarten children, it is important to keep in mind scientific information about light, darkness and shadows. This background knowledge will help support your understanding as you guide children through the learning experiences in this unit. For example, many children will notice that the moon "shines" at night; however, the moon actually reflects light from the sun. We call sunlight "white light," but it is actually composed of many colors. Children may make observations that are scientifically inaccurate. We aim to support their observations and predictions while using our own background knowledge to ask questions that extend

their thinking. Please explore the teacher resources in Section IX, or other accurate resources for background science knowledge on light.

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*We aim to support their (children's) observations and predictions while using our own background knowledge to ask questions that extend their thinking.*

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Throughout this unit, there are opportunities to develop children's literacy skills. Children will enjoy literature, engage in discussions around stories, and retell and act out stories they have read. Children will build on what they know about light, darkness, and shadows through informational texts. They will explore vocabulary words such as "silhouette" and "transparent" to continue to develop their language skills as they engage in scientific explorations and thinking. In Unit 5: Transportation, there were opportunities to focus on a few key letters and numbers that reflected the transportation modes that were relevant to your classroom. In this unit, we encourage you to highlight and help children explore the types of lines that form letters, numbers and shapes. You can use the light table in the Writing Center to display various types of lines and for children to explore and look critically at lines, letters, numbers and shapes. Children can practice

forming the different types of lines that they observe through writing, painting, drawing, etc. As children explore shadows, there will be more opportunities to notice lines and shapes. Children will build their knowledge of letters, numbers and shapes as they explore these components.

## III. Unit Framework

### Essential Question

This is a child-friendly question that connects the knowledge and skills that children should develop throughout the unit.

### Focus Questions

These represent the major inquiries of the unit. They build over time and require children to make connections across all content areas. Each focus question is designed to take about one week to explore.

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*These are key components of each Pre-K for All Unit of Study.*

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### Foundational Learning Experiences

These are experiences (e.g., whole group, small group lessons, field trips, observations, center activities) for each subtopic that provide ample opportunities to deepen children’s understanding of the Focus Questions.

### Foundational Texts

*PK.ELAL.9 [PKR.5] Interacts with a variety of genres (e.g., storybooks, poems, songs)*

These are a combination of literary and informational texts that can be read throughout the unit. See Section XI for text-based critical thinking questions to support the read aloud experience.

Engaging, informative and literary texts provide opportunities for exploring content, expressing ideas using one’s imagination and critical thinking that are enhanced through multiple readings of the same book. Reading books multiple times helps all children build a deeper understanding of content, make meaningful connections between content and other concepts or experiences and builds their confidence as learners and as future readers.

### Key Vocabulary

These are academic vocabulary words that help children understand the unit focus questions and access complex texts. These words can be supplemented by vocabulary in read alouds.

### Family and Community Engagement

These are ideas for inviting families to share their experience and knowledge with the class, or for extending learning outside of the classroom. They are aligned to the [NYC DOE Division of Early Childhood Education Early Childhood Framework for Quality \(EFCQ\)](#).

See Section IX: Supporting Resources for more information about Family Engagement Practices.

### Culminating Celebration

This is an opportunity to reflect on the unit with the children, as well as to note and celebrate the growth and learning that has occurred.

## Unit Six: Light

### Essential Question: How and why do we use different kinds of light?

	<b>Week One</b>	<b>Week Two</b>	<b>Week Three</b>	<b>Week Four</b>
<b>Focus Questions</b>	<b>What kinds of lights are around us?</b>	<b>What is darkness?</b>	<b>How does light help us?</b>	<b>What are shadows?</b>
<b>Foundational Learning Experiences</b>	<p><b>Foundational Text Read Aloud</b></p> <p>Read the foundational text, <i>All About Light</i> by Lisa Trumbauer, aloud to the class, pausing to ask the inquiry and critical thinking questions from Section IX. Use the questions as a guide for discussion and conversation.</p> <p><i>PK.ELAL.5. [PKR.1.] Participates in discussions about a text (e.g., during whole or small group interactive read-aloud discussions, during peer sharing, within play scenarios)</i></p> <p>See page 37 for lesson plan</p>	<p><b>Whole Group</b></p> <p>Show children Vincent van Gogh's The Starry Night painting or another art piece involving light that may be more responsive to your classroom community (see Section X Appendices) and allow children time to think about and respond to the art. Select some questions to help children think critically about the art and their reactions to it (e.g., What do you notice about the painting? Where do you see light in this art? What colors do you notice? What might these colors mean? What does the title of the painting tell us? How does the painting make you feel?).</p> <p><i>PK.ARTS.18. [VA:Re7-9.PK] Responds to Visual Arts</i></p> <p>See page 41 for lesson plan.</p>	<p><b>Small Group</b></p> <p>Invite children to plant seeds. Place half of the planted seeds in an area that gets sunlight and the other half in an area that is dark. Invite children to predict which seeds are most likely to grow and why. Monitor the planted seeds periodically. To conclude the experiment refer back to the children's predictions; discuss and graph the results.</p> <p><i>PK.SCI.9. [P-PS3-1.] Participates in an investigation to determine the effect of sunlight on Earth's surface.</i></p> <p>See page 45 for lesson plan.</p>	<p><b>Outdoors</b></p> <p>Point children's shadows out to them. Invite them to move their bodies and watch their shadows. Ask children to pause and pose. If possible, take pictures of the children's shadows. Ask children to tell you about their shadows and write down their responses. Display their thoughts and pictures in the classroom**.</p> <p><i>PK.SCI.9. [P-PS3-1.] Participates in an investigation to determine the effect of sunlight on Earth's surface.</i></p> <p>See page 49 for lesson plan.</p> <p><b>**Do not use personal devices and ensure that you have signed permission before taking photographs of children.</b></p>

	<b>Week One</b>	<b>Week Two</b>	<b>Week Three</b>	<b>Week Four</b>
<b>Focus Questions</b>	What kinds of lights are around us?	What is darkness?	How does light help us?	What are shadows?
<b>Foundational Texts</b>	<i>All About Light</i> by Lisa Trumbauer	<i>Blackout</i> by John Rocco	<i>Kitten and the Night Watchman</i> by John Sullivan	<i>Moonbear's Shadow</i> by Frank Asch
<b>Key Vocabulary</b>	candle, curve, electricity, fire, firefly, flame, flashlight, lamp lantern, light, light bulb, lightning, lines, moon, rainbow, stars, straight, street light, sun, traffic light	blackout, clouds, dark, diurnal, horizontal, night, nocturnal, opaque, shade, sunglasses, transparent, translucent, vertical	batteries, day, eyes, eyesight, flashlight, grow, heat, night, melt, mirror, reflection, see, sight, solar power, spiral, zigzag	parallel, shadow, silhouette, outline, weather, wavy
<b>Family and Community Engagement</b> <i>EFAQ 4: High quality programs promote families' role as primary caregivers, teachers, and advocates</i>	After reading the book, <i>Round Trip</i> by Ann Jonas in class, send children home with a piece of black paper and a piece of white paper and invite them to use the two pieces of paper to create an image or story about somewhere they have gone together. They could cut and/or rip the paper and can use glue but should not add other colors or use other materials in their pictures. Ask families to return the pictures to pre-K with a brief description of the art. Display the art in the classroom.	Invite families and children to note how dark or light it is at pick up and/or drop off and compare what they see to various points throughout the year. For example, if it is dark when families pick up their children they might consider if it is always dark at pickup and why or why not.	How many lights did you turn on this morning? Invite children to pick one morning to count how many lights their family turned on, as they got ready for the day.  OR  What do we see when the lights are off? Invite families to turn off the lights at night for a few minutes and discuss what they can see without the lights.	Invite children and families to create finger shadow puppets together at home by putting their hands in various positions in front of a light source (e.g. flashlight, lamp or sunny window) and looking at the shadows produced. They could try to make different types of animals or make one puppet and use it to tell a story together.  See Section XI: Appendices for sample puppets.
<b>Culminating Celebration</b>	Invite the children to plan a light show. Talk about what a light show might look like and sound like, and whom they would like to invite to watch the show. If children struggle to determine what to do at the show, provide examples such as choosing one piece of music (or more) as a group and shine flashlights on a white sheet, white wall, or ceiling, and moving them around as the music plays. Create a			

	<b>Week One</b>	<b>Week Two</b>	<b>Week Three</b>	<b>Week Four</b>
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	<p>name for the show and have children make invitations for another class, families and/or staff members. Turn off the lights, play the music, and have fun.</p> <p>OR</p> <p>Do shadow puppet shows. Spend several days creating stories with the class in small groups. Each group can create puppets for their shadow show. For the performance, hang a sheet, place a light source behind it, and have children use their puppets behind the sheet to act out their story while you (or they) read their words.</p>			

## IV. Ideas for Learning Centers

Learning centers should be used to advance the unit's essential and focus questions, as well as the enduring understandings, and reflect the unit of study as well as the needs of your children. The following suggestions supplement the standard materials you have in each center such as blocks in the Blocks/Construction Area, assorted dress-up materials in Dramatic Play, paper and a variety of writing utensils in the Writing Center, etc. As you plan your learning centers, also consider how you will provide multiple entry points into the materials for all the children in your classroom. The suggested materials and activities are intended to be relatable and fun! This is not an exhaustive list of materials and can be supplemented by other materials relevant to the unit and your classroom. In this unit there are opportunities to use technology such as flashlights, light tables and overhead projectors to assist children's learning. Where possible, alternatives to these tools are provided for classrooms that do not have access to these materials. However, Appendix A also includes simple directions for creating a light table on your own.

The study of Light revolves around scientific concepts and explorations. In this unit, the interactions between adults and children offer an opportunity to model, encourage and facilitate the use of language to ask higher order thinking questions as well as create meaningful entry points

into increasingly complex content. As you play with children in the various centers, encourage them to use their senses to observe the materials around them and then use their observations to make predictions about what might happen if they manipulate the materials. Scaffold the children as they test their predictions and provide assistance in drawing and communicating conclusions when needed. Refer to the critical thinking questions for each center to help guide these interactions.

While the materials you select for centers are extremely important, learning is made richer through the interactions adults and children have during center time. When teaching staff interact with children in centers they can model language through initiating, joining and extending conversations, using self and parallel talk, and asking open-ended questions that deepen engagement and inquiry while developing problem solving and critical thinking skills.

Play is an important vehicle for developing a variety of skills outlined in the NYSPLS and is woven into many of the Early Childhood Framework for Quality (EFQ). Rather than detracting from academic learning, purposeful play supports the abilities that underlie such learning. When children have a sufficient amount of time to play and can access learning centers and the materials in them, they have some of the essential supports necessary for

their play to continue developing in complexity. The play-based learning that happens in centers addresses NYSPLS Standard, PK.AL.1 *Actively engages in play as a means of exploration and learning*. This same play helps children develop the background knowledge of NYSPLS Standard PK.AC.2. (*Demonstrates they are building background knowledge*) which is essential for making connections and deepening understandings. For these reasons, teachers should ensure that children have access to and can choose from a variety of learning center materials for one-third of the pre-K day, and support children's engagement in play during center time, making adjustments to the daily schedule to weave in small and whole group activities without infringing on that time. NYSPLS standards are included for all of the activity suggestions here and opportunities for assessment are embedded. Text suggestions that complement these materials and activities are also included.

# Blocks/Construction

## Critical thinking questions/statements:

Tell me about your work.

I notice that you \_\_\_\_.

What are some other things you could add?

I wonder what would happen if \_\_\_\_.

How do you know?

How could you build \_\_\_\_?

What is your conclusion?

## Suggested Text:

*City Moon* by Rachael Cole and Blanca Gómez

After creating a night sky in the Art Center, hang the sky in the Blocks/Construction Center. Invite the children to pretend they are building at night.

*PK.AL.3. Approaches tasks and problems with creativity, imagination and/or willingness to try new experiences*

## Reflective Blocks:

Adhere strips of Mylar or other reflective materials such as tin foil to a few of the classroom blocks for children to use as they build.

*PK.AL.1 Actively engages in play as a means of exploration and learning*

## Building Shadows:

Tape paper to the walls in the Blocks/Construction Center. Invite children to build in front of the paper. Note the shadows created and invite children to trace the shadows on the paper on the wall. Alternatively, place paper on the floor and trace the shadows this way. If there is not sufficient sunlight in the block area to do this activity, consider implementing it in another part of the classroom, or using a flashlight to create shadows.

*PK.SCI.9. [P-PS3-1.] Participates in an investigation to determine the effect of sunlight on Earth's surface.*

## Balance and Reflection:

Add a collection of tubes (e.g., paper towel tubes, toilet paper tubes, wrapping paper tubes) and old CDs to the Blocks/Construction Center. Invite children to build with the tubes and CDs and explore how the CDs reflect light.

*PK.AL.4. Exhibits curiosity, interest, and willingness to learn new things and have new experiences*

## Traffic Lights:

Add small traffic lights and traffic signal toys (or make your own) for children to use as they build.

*PK.PDH.9. Demonstrates awareness and understanding of safety rules*

## Skyline:

Add pictures of the nighttime NYC skyline to the walls in the Blocks/Construction Center. Invite children to observe the lights in the picture and create additional buildings to add to the skyline.

*PK.SOC.5 Demonstrates knowledge of the relationship between people, places, and regions*

## Shadow Letters:

Invite children to explore how they might use blocks and a flashlight to create shadow letters. Encourage them to consider how they can build structures that will produce a letter shadow?

*PK.AL.2 Actively engages in problem solving*

**✓ Opportunity for Assessment:** How does the child approach this task? What strategies do they try? How do they respond to challenges that occur throughout the activity?

## Window Blocks:

If available, add window blocks to this Center. Encourage children to be intentional about how they use these blocks in their structures. If window blocks are unavailable, cut shapes from colored translucent file folders or laminated tissue paper and glue together Popsicle sticks to create a sturdy frame and create a homemade set of window blocks.

*PK.AL.3. Approaches tasks and problems with creativity, imagination and/or willingness to try new experience*

## Dramatic Play

### Critical thinking questions/statements:

Who are you going to be today?  
 I wonder what would happen if \_\_\_\_?  
 What will you do next?  
 What do you think about \_\_\_\_?  
 What does that remind you of?

### Suggested Text:

*Astro Girl* by Ken Wilson-Max

Invite the children to pretend to be astronauts. If desired, they can create props to support their play.

*PK.SCI.7. [P-ESS1-1.] Observes and describes the apparent motions of the sun, moon, and stars to recognize predictable patterns*

### Shadow Play:

Hang a white sheet, place a light source behind it, and invite children to stand behind the sheet and act out stories. They can retell familiar stories or create new stories of their own. Some children can be the performers and others can be the audience.

*PK.ARTS.15. [TH:Cn10-11.PK] Connects to Theatrical Arts*

### Sunglasses:

Add a basket of sunglasses to the Dramatic Play Center. Talk with the children about when and why they might wear sunglasses. Invite them to use them as they play.

*PK.AC. 2 Demonstrates they are building background knowledge*

### Tent:

Using a light gauze or comparable see-through fabric, create a tent. Supply flashlights and reflective items and invite children to play inside the tent. Invite children to talk about the materials and reflect on the roles they take on as they play.

*PK.ARTS.14. [TH:Re7-9.PK] Responds to Theatrical Arts*

## Art

### Critical thinking questions/statements:

Tell me about your art.  
 What did you notice about \_\_\_\_?  
 I notice that you \_\_\_\_\_. How did you do that?  
 What will you try next? Why?  
 How does this picture, painting, drawing, etc. make you feel? Why?

### Suggested Text:

*City Moon* by Rachael Cole and Blanca Gómez

Invite the children to create a mural depicting the night sky. After creating the mural, hang it in the Blocks/Construction Center and invite the children to pretend they are building at night.

*PK.SCI.9. [P-PS3-1.] Participates in an investigation to determine the effect of sunlight on Earth's surface.*

### Luminaries:

Invite children to decorate empty, clean, clear plastic milk jugs (or other containers) with permanent markers. Monitor the children closely as they use the permanent markers. Fill the containers with strings of small lights and display.

*PK.PDH.5. Demonstrates eye-hand coordination and fine motor skills*

### Pipe Cleaner Art:

Invite children to create designs with pipe cleaners by twisting and bending them together. Hang this art in front of a blank wall. Shine a light behind the artwork and note the shadows created. Invite children to look at the types of lines they see in the shadows. Are there straight lines? Curvy? Any zigzags or spirals? Did anyone create letters, numbers or shapes?

*PK.AC.4. Demonstrates a growing receptive vocabulary*

✓ **Opportunity for Assessment:** What vocabulary words related to line type (e.g. line, horizontal, outline, spiral, straight, vertical, wavy, zigzag) is the children able to understand?

### Stained Glass Windows:

Provide tissue paper and contact paper or clear container lids, and glue. Invite children to use the tissue paper to create designs and place them on the contact paper or lid. If using lids, have children paint the surface with glue before adding pieces of tissue paper. Allow the art to dry then hang in a window. Encourage children to note the effect sunlight has on the art.

*PK.SCI.9. [P-PS3-1.] Participates in an investigation to determine the effect of sunlight on Earth's surface.*

### Round Trip:

After reading the book *Round Trip* by Ann Jonas, provide black and white paper for children to use to create a picture about a trip or outing of their own. They can cut or rip the paper and use glue to assemble their art.

*PK.ELAL.15. [PKW.3] Uses a combination of drawing, dictating, oral expression, and/or emergent writing to narrate an event or events in a sequence*

### Translucent/Opaque Collage:

Tape a piece of clear contact paper, sticky side out, to a window. Invite children to add collage pieces to the paper to create a sun catcher. As the children work, talk with them about the different types of materials they add. Are the materials translucent or opaque? Introduce these vocabulary words to the children and use them as children create the collage.

*PK.PDH.1. Uses senses to assist and guide learning.*

### Light Table:

Place paper on top of the light table and invite children to paint or draw on the light table.

*PK.ARTS.16. [VA:Cr1-3.PK] Creates Visual Arts*

## Science/Discovery

### Critical thinking questions/statements:

What did you observe here/when \_\_\_\_?  
 What did your sense of \_\_\_\_ tell you about \_\_\_\_?  
 What will you try next?  
 I wonder what would happen if \_\_\_\_?  
 How do you know? How could we find out?

### Suggested Text:

*Sources of Light* by Daniel Nunn

Invite the children to refer to this book as they explore light and light related objects. If possible, add an assortment of objects that are sources of light, as well as objects that are not sources of light, to the center and invite children to explore.

*PK.AL.4. Exhibits curiosity, interest, and willingness to learn new things and have new experiences*

### Prisms:

If available, invite children to explore hand-held prisms (transparent objects that are triangular). Model how to position the prisms in order to bend light and create rainbows. Introduce the word prism to the children and use it often throughout the exploration.

*PK.SCI.9. [P-PS3-1.] Participates in an investigation to determine the effect of sunlight on Earth's surface.*

### Flashlight Parts:

Provide flashlights and invite children to disassemble them and explore the parts. Help them ponder how the flashlight works as well as what each piece is for and how they fit together.

*PK.AL.4. Exhibits curiosity, interest, and willingness to learn new things and have new experiences*

### Diurnal vs Nocturnal:

Animals that are awake during the day are diurnal and animals that are awake during the night are nocturnal. Share this information with children and provide an assortment of animal toys for children to sort into the two categories.

*PK.SCI.4. [P-LS1-1.] Observes familiar plants and animals (including humans) and describes what they need to survive*

### Holes:

Provide working flashlights as well as various containers with holes such as colanders, sieves, sifters, sippy cup lids, etc. Invite children to shine the flashlight inside the container and discuss their observations.

*PK.AL.3. Approaches tasks and problems with creativity, imagination and/or willingness to try new experiences*

### Sun Stains:

Provide each child with a piece of colored construction paper. Determine a sunny space where children can keep their papers for a few days. Supply an assortment of cut paper strips in various lines such as straight, curvy and zigzag; invite children to place the lines on the paper. Encourage them to consider how they could combine the lines to make various letters or numbers. Let the papers sit for a few days. Later, revisit the papers, remove the strips from the paper and examine the paper together. Encourage children to observe and consider what happened and why.

*PK.SCI.9. [P-PS3-1.] Participates in an investigation to determine the effect of sunlight on Earth's surface.*

### Reflections:

Introduce the word reflection to the children and use this word throughout the exploration. Invite children to look at their own reflections in a mirror (or a spoon if mirrors are not available). Encourage them to look for other reflective items throughout the classroom. Encourage them to draw pictures or write down the names of these items. Later add a collection of reflective items to the Science Center for children to explore further.

*PK.AC.4. Demonstrates a growing receptive vocabulary*

***Light Table:***

Supply an assortment of small items such as shower curtain rings, glass stones, small sticks, feathers, leaves, keys, etc. for children to explore on the light table.

*PK.AL.1 Actively engages in play as a means of exploration and learning*

***Light Table:***

Cut shapes (start with circle, square and triangle, and move on to rectangles and more complex shapes as children are ready) from translucent file folders or page dividers of various colors; add to the light table and invite children to explore.

*PK.MATH.13. [NY-PK.G.2.] Names shapes regardless of size*

✓ **Opportunity for Assessment:** What shapes is the child able to identify? Is the child able to name shapes regardless of their size or orientation?

# Toys and Games / Math Manipulatives

## Critical thinking questions/statements:

I notice that you \_\_\_\_\_. What do you notice?  
What happened when you \_\_\_\_?  
Why do you think that happened?  
If I want to \_\_\_\_\_, what should I do? Why?  
Tell me about \_\_\_\_\_.  
How do you know?  
Tell me why \_\_\_\_\_.  
  
**Suggested Text:**

### *How Many Stars in the Sky* by Lenny Hort

Supply a dark piece of paper as well as paper stars, and numeral or counting cards. Invite children to place stars in the sky, count them, and find the corresponding number card. Alternatively, children could select a card and place the corresponding number of stars in the sky.

*PK.PDH.5. Demonstrates eye-hand coordination and fine motor skills*

## Mirrors:

Add mirrors to the Manipulatives Center and invite children to build on them or next to them. What do they notice? What do they see in the mirror as they work?

*PK.AL.1 Actively engages in play as a means of exploration and learning*

## Magna-Tiles and Glow Sticks:

Provide glow sticks for children to use as they build with Magna-Tiles. Encourage children to place the glow sticks inside their structures and note what they see.

*PK.PDH.1. Uses senses to assist and guide learning.*

## Find a Match:

Create outlines of small manipulatives by tracing around them on paper. Invite children to find the manipulatives that match each outline. Encourage children to find all of the matches. Use words like straight, up, and across to describe the outlines and help children find matches.

*PK.AL.5. Demonstrates persistence*

## Patterning:

Supply translucent plastic drinking cups in a variety of colors. Invite children to create patterns with the cups. Consider implementing on a light table, if available.

*PK.MATH.9. [NY-PK.OA.2.] Duplicates and extends simple patterns using concrete objects (e.g., what comes next?)*

## Shadow Building:

Invite children to build with small blocks and connecting manipulatives and shine a light behind the structures. Encourage children to observe and discuss the shadows created. Consider casting the shadows on pieces of paper and inviting children to trace them.

*PK.PDH.5. Demonstrates eye-hand coordination and fine motor skills*

**✓ Opportunity for Assessment:** How does the child manipulate small objects?

## Light Table:

Supply translucent plastic drinking straws in a variety of colors as well as small balls of playdough or pencil grips. Invite children to use the straws to create shapes or build structures with the straws. The playdough or pencil grips can secure the shapes together to form angles.

*PK.MATH.15. [NY-PK.G.4.] Creates and builds shapes from components (e.g., sticks, blocks, clay)*

## Sand and Water / Sensory

### Critical thinking questions/statements:

What happens when \_\_\_? Why?  
 How do you think that works? Why?  
 How could you change that?  
 What does that remind you of? Why?  
 What would happen if \_\_\_? Tell me more.

### Suggested Text:

*Glow: Animals with Their Own Night-Lights* by W. H. Beck

Invite children to explore this book before adding glow sticks to dark colored water (see *Glowing* activity, far right). Children can pretend the glow sticks are animals from the book.

*PK.SCI.5. [P-LS1-2.] Participates in investigations to determine how familiar plants and/or animals use their external parts to help them survive in the environment*

### Mirrors:

Place mirrors in the bottom of the sensory table and add water and various items. Invite children to observe and explore.

*PK.AL.1 Actively engages in play as a means of exploration and learning*

### Foil:

Line the bottom (or underside, if the table is clear) of the sensory table with tin foil. Add water as well as glass beads, bath balls, containers, scoops, etc. Invite children to explore, sort and enjoy

*PK.AL.4. Exhibits curiosity, interest, and willingness to learn new things and have new experiences*

### Traffic Lights:

Add red, yellow, and green plastic circles to the pourable materials in the sensory table as well as containers and scoops for scooping and sorting. Talk with the children about traffic lights. Encourage them to consider how traffic lights help keep us safe. Encourage children to think about other lights that are helpful, as well.

*PK.PDH.9. Demonstrates awareness and understanding of safety rules*

### Glowing:

Use liquid food color or liquid watercolors to create dark water in the table. Add non-toxic glow sticks and invite the children to explore.

*PK.AL.1 Actively engages in play as a means of exploration and learning*

### Light Table:

Place a lamp or light source under the sensory table to turn the sensory table into a light table. Invite children to think about which objects to add to the table to explore. Encourage them to share why they think these objects might be interesting objects to include.

*PK.AL.3. Approaches tasks and problems with creativity, imagination and/or willingness to try new experiences*

**✓ Opportunity for Assessment:** What objects does the child suggest exploring? Why did they select these particular objects?

## Library

### Critical thinking questions/statements:

Tell me about this book.  
 What do you like about this book?  
 What is your favorite part of this book? Why?  
 What do you notice?  
 What do you think is happening?  
 What will happen next?  
 Does that remind you of anything? What?  
 Would you recommend this book to a friend? Why or why not?

### Note:

Add books from the Foundational and Supporting Text list in Section V to your classroom library to create a collection of books that deepen children's understanding of the unit.

### ***Shadow Puppets:***

Create a shadow puppet theater and puppets (See Section XI Appendices). Consider creating puppets from favorite classroom stories or create puppets that match the interests of the class and invite children to tell stories.

*PK.ARTS.13. [TH:Pr4-6.PK] Performs Theatrical Arts*

### ***My Shadow:***

Write out the poem, ***My Shadow***, by Robert Louis Stevenson (or another poem about light and shadows that is more relevant to the children). Post it in the library, read it to the children, and refer to it throughout the unit.

*PK.ELAL.9 [PKR.5] Interacts with a variety of genres (e.g., storybooks, poems, songs)*

### ***Light Table:***

Using permanent markers, draw pictures of the main characters and other important items from a favorite class story on clear plastic cups. Place the cups on the light table and invite children to use them to retell the story. Children might also want to use the props to expand on the story or create alternate endings

*PK.ELAL.6. [PKR.2] Retells stories or share information from a text*

# Cooking and Mixing

*(as needed)*

## Critical thinking questions/statements:

Why do you think we are adding \_\_\_\_?  
 What would happen if \_\_\_\_?  
 What do you notice as we do this?  
 How does it smell/feel/look/sound/taste?  
 What does this remind you of?

## Note:

Be mindful of children's food intolerances and allergies by connecting with families before you do cooking activities and explicitly teaching children how being aware of allergies keeps us safe.

Children must always wash hands before and after cooking experiences.

*PK.PDH.7. Demonstrates personal care and hygiene skills*

Snacks and meals must be of adequate nutritional value. When providing snacks and meals, supplement with other components of a healthy meal/snack according to appropriate meal guidelines in order to make sure children's nutritional needs are met.

## ***Starry Night Playdough Pictures:***

Make blue and yellow playdough with the children. When the dough is ready, provide pictures of van Gogh's Starry Night painting for the children to view, and then ask them to use the yellow and blue playdough to create their own representations of a night scene. Consider other art and/or artists that may be more responsive to the children in the class for this activity (see Section X. Appendices). Modify the playdough colors according to the artwork selected.

*PK.ARTS.16. [VA:Cr1-3.PK] Creates Visual Arts*

## ***Lines, Letters, Numbers and Shapes:***

Make playdough with the children then model rolling the playdough into thin lines and invite children to use the lines to create various letters, numbers and shapes.

*PK.ELAL.1. [PKRF.1.] Demonstrates understanding of the organization and basic features of print*

## ***Light Table:***

Cut thin slices of various fruits and vegetables. Supply clear plastic plates and invite children to select a couple of fruit or vegetable slices, place them on a plate and place the plate on the light table. Are the slices translucent or opaque? After children examine the fruits and vegetables they can eat them for a healthy snack

*PK.PDH.1. Uses senses to assist and guide learning.*

# Computer/Technology

Content should be free of product placement/advertising. Children are not to use computers or other devices with screens more than 15 minutes per day, with a maximum of 30 minutes per week. Exceptions to this limit may be made for children with disabilities who require assistive computer technology as outlines in their Individualized Education Program. Prescreen images and videos to make sure they are appropriate for children and not frightening or explicit. Do not use personal devices and ensure that you have signed permission before taking photographs of children.

## Critical thinking questions/statements:

I notice that you \_\_\_\_.

How did you figure that out?

What will you do next? What if you try \_\_\_\_?

How could you \_\_\_\_

## Drawing With Light:

If a camera with video option is available, invite children to use a flashlight in a dark room to draw designs. Record the process and play back for the children to view. Discuss the videos and process with the children. Note the type of lines created with the light and use vocabulary such as wavy, straight, zigzag, etc.

*PK.ARTS.5. [MA:Cr1-3.PK] Creates Media Arts*

## ***Lite Brite:***

If available, allow children to explore a Lite Brite. Children can play with it to create visual art and/or explore the components and how it works.

*PK.AL.1 Actively engages in play as a means of exploration and learning*

## ***Light Installations:***

If a Lite Brite is available, use it to encourage children to explore light installations. Share a few images of Rafael Lozano-Hemmer, Dan Flavin, Iván Navarro, or Tatsuo Miyajima's light installations (or other artists that may be more responsive to the classroom community) and invite children to use the Lite Brite to create their own light installations.

*PK.ARTS.16. [VA:Cr1-3.PK] Creates Visual Arts*

## ***Fireworks:***

Use a search engine to find pictures of fireworks on the internet and use as inspiration for painting. Invite children to help you search for the pictures and determine which ones to print.

*PK.SEL.2. Recognizes self as an individual having unique abilities, characteristics, feelings and interests*

## ***Sun, Moon and Stars:***

Use a search engine to find satellite pictures of the sun, moon and various stars. Engage the children in a discussion about the characteristics and movement of the sun, moon, and stars.

*PK.SCI.7. [P-ESS1-1.] Observes and describes the apparent motions of the sun, moon, and stars to recognize predictable patterns*

## Outdoors / Playground

### Critical thinking questions/statements:

I saw you \_\_\_\_.  
 What will you do next?  
 If you try \_\_\_\_ , what do you notice?  
 How did you do \_\_\_\_?  
 How does it feel outside today?  
 What do you see?

### Suggested Text:

*Shadow* by Suzy Lee

Invite children to look for and explore the shadows they see outside or in the Gross Motor Area. They may also like to explore how they can make different shadow shapes with their own bodies or objects.

*PK.SCI.9. [P-PS3-1.] Participates in an investigation to determine the effect of sunlight on Earth's surface*

### Jack be Nimble:

Supply a small block or another similar item to represent a candlestick. Invite children to take turns jumping over the item. As the children jump, say the rhyme, Jack be nimble, Jack be quick, Jack jump over the candlestick. Replace the name "Jack" with a child's name to indicate their turn

*PK.PDH.3. Demonstrates coordination and control of large muscles*

### Red Light, Green Light:

Play Red Light, Green Light, outdoors or on the playground with the children. Refer to Unit 5: Transportation for implementation directions.

*PK.ELAL.28. [PKL.5] Explores and discusses word relationships and word meanings*

### Ring Toss:

If glow sticks are available, fasten them into rings and invite children to toss them into a large bowl.

*PK.PDH.4. Combines a sequence of large motor skills with and without the use of equipment*

### Light Table:

Allow children to collect natural items from outside and explore on the light table.

*PK.SCI.5. [P-LS1-2.] Participates in investigations to determine how familiar plants and/or animals use their external parts to help them survive in the environment*

### Weather and Seasons:

Help children begin to consider how light, temperature and weather are related through inquiry based questions such as, "What happens when it is dark or light out? What do you notice when it gets colder outside? Was the sun shining when you came to school this morning?" Keep in mind that at this age children understand time and seasons as related to their experiences.

*PK.SCI.7. [P-ESS1-1.] Observes and describes the apparent motions of the sun, moon, and stars to recognize predictable patterns*

### My Shadow Does That Too:

Point children's shadows out to them. Invite them to move their bodies and watch their shadows. Ask children to pause and pose. If possible, take pictures of the children's shadows. Ask children to tell you about their shadows and write down their responses. Display their thoughts and pictures in the classroom\*\*.

*PK.SCI.9. [P-PS3-1.] Participates in an investigation to determine the effect of sunlight on Earth's surface.*

.See page 49 for lesson plan.

\*\* Do not use personal devices and ensure that you have signed permission before taking photographs of children.

# Writing

## Critical thinking questions/statements:

I notice that you \_\_\_\_.  
 That reminds me of \_\_\_\_.  
 What if you try \_\_\_\_?  
 How could we find out \_\_\_\_?

## Suggested Text:

*All About Light* by Lisa Trumbauer

Invite children to create their own books about light. They might want to include information they have learned about light, or facts/ideas that they think are especially interesting. Children may want to draw, dictate, or use their own emerging writing skills to record information in their books.

*PK.AC.2. Demonstrates they are building background knowledge*

### **Letters with Holes:**

Use a hole punch to create letters on pieces of paper. Allow children to place the papers over a light source such as a flashlight, light table or lamp and explore the letters and light.

*PK.ELAL.1. [PKRF.1.] Demonstrates understanding of the organization and basic features of print*

### **Large Letters:**

Allow children to place small plastic letters and numbers onto an overhead projector (if available). Project these items onto an empty wall or hang a white sheet on a wall to provide a clear space for children to see the projected letters and numbers.

*PK.ELAL.1. [PKRF.1.] Demonstrates understanding of the organization and basic features of print*

✓ **Opportunity for Assessment:** What letters can the child recognize and/or name?

### **Lamination Letters:**

Provide blank lamination pages/pockets and invite children to draw or write on them. Encourage children to look at the various types of lines; discuss the types of lines they see in the letters and recreate what they see. Hang the work in a window.

*PK.ELAL.25. [PKL.1] Demonstrates command of the conventions of academic English grammar and usage when writing or speaking.*

### **What is Under the Table?**

Write this question on a piece of paper and place the paper on top of the table. Model reading the question to the children, pointing to each word as you read, and invite them to read it too. Tape a picture, letter, number, type of line, or shape under the table. Supply flashlights and allow children to shine them under the table to find the hidden item(s) and answer the question. Children can write or draw pictures to answer the question if desired. Consider posing different questions on other days but continue to allow children to look under the table to find the answer.

*PK.ELAL.1. [PKRF.1.] Demonstrates understanding of the organization and basic features of print*

### **Lines and Letters:**

If available, use an overhead projector to project lines and letters onto a wall. Place large sheets of paper on the wall and invite children to trace the lines and letters. Use the words horizontal, vertical, straight, spiral and curve to describe the lines.

*PK.AC.4. Demonstrates a growing receptive vocabulary*

### **Light Table:**

Add a thin layer of sand to the top of the light table. Supply paint brushes and allow children to use the brushes to draw lines, letters, numbers and shapes.

*PK.ELAL.25. [PKL.1] Demonstrates command of the conventions of academic English grammar and usage when writing or speaking.*

## Music and Movement

### Critical thinking questions/statements:

I see you moving like this.  
 I heard you \_\_\_\_\_.  
 I saw you \_\_\_\_\_.  
 Tell me about that.  
 Let's try playing the music loud (or soft, fast, slow).  
 Can you try this?  
 How does this music make you feel?  
 Have you heard music like this before? Where?

### *Dump Truck Disco* by Skye Silver

Invite children to pretend to be the trucks in this book, they can pretend to turn on their lights and dance, sing, and build along with the song.

*PK.ARTS.11. [MU:Cn10-11.PK] Connects to Music*

### *Larger Than Life:*

Invite children to draw pictures on overhead projector transparencies of people moving their bodies in different ways. Project the drawings on a wall or white sheet. Invite children to try to position their bodies in the same way as the people in the drawings. If a projector is not available children can draw on regular paper, then refer to the drawings and position their bodies accordingly.

*PK.PDH.3. Demonstrates coordination and control of large muscles*

### *Disco Ball:*

Hang a disco ball in the Music and Movement Center, play music for dancing and invite children to dance. Also consider playing quiet, calm music and invite children to relax, listen to the music and observe the disco ball. Discuss their observations with them. To create a disco ball glue squares of tin foil to a ball or balloon.

*PK.ARTS.1. [DA:Cr1-3.PK] Creates Dance*

### *Nocturne:*

A nocturne is a musical work that creates the feeling of night. Play a nocturne for children and supply scarves for them to use as they dance to the music.

*PK.ARTS.2. [DA:Pr4-6.PK] Performs Dance*

**✓ Opportunity for Assessment:** How does the child use their body while dancing? What movements (sway, stomp, twist, etc.) do they use?

### *Light Table:*

Create a water xylophone. Fill small glass jars with various amounts of colored water and place them on the light table. Invite children to gently tap the sides of the jar with a spoon and listen to the different tones produced.

*PK.SCI.3. [P-PS4-1.] Plans and conducts investigations to provide evidence that sound is produced by vibrating materials*

## V. Foundational and Supporting Texts

Books are essential to a well-planned unit and ground the learning experiences for children. Engage children with books throughout the day. Read alouds can occur in large group and small group as well as in centers. Books can be incorporated throughout the room and enhance children's learning through play. Some books are read repeatedly throughout the unit. Some books will be read only once or twice throughout the unit; these are supporting texts. Supporting texts compliment focus questions and areas of interest or may be related to the essential question or enduring understandings of the unit. Select the books that seem most relevant to your classroom community. Additionally, the following list is not exhaustive and can be supplemented by similar books. Not only can these books be read aloud both formally and informally, but children should also be able to access and read these books on their own. Allowing children access to classroom books encourages children to display emergent reading behaviors and address *PK.CLL.4 (Reading Standards: Foundational Skills): Displays emergent reading behaviors with purpose and understanding (e.g., pretend reading)*.

\*Books with an asterisk are also available in languages other than English

### Foundational Texts

**All About Light** by Lisa Trumbauer: Where does light come from? How does it travel?

**Blackout** by John Rocco: One hot summer night in the city, all the power goes out. What's a family to do?

**Kitten and the Night Watchman** by John Sullivan: A night watchman spies a stray kitten one night and the two befriend each other.

**Moonbear's Shadow** by Frank Asch: Moonbear tries to outwit his troublesome shadow.

### How to Use Foundational Texts

When you have a text that draws the interest of the children in your class, consider one or more of the following techniques for reading the book multiple times to extend children's thinking:

- Take a "picture walk" through the book the first time you read it by just showing the pictures and asking the children what they see and what they think the book is about.
- Consider reading the book once without pausing so that children hear the cadence of the words and hear the story in its entirety.
- Model skills readers use to gain greater understanding of content by thinking aloud about the meaning of a word in context or drawing a conclusion based on prior knowledge.
- Write down and post children's responses to questions with more than one possible answer.
- Ask children to make predictions based on what they know so far and ask them to explain their thinking.
- Pause throughout the book and ask children to share a new word or idea they heard and explain it using familiar words or contexts.
- Invite children to make connections between the book and their own life experiences.
- Brainstorm potential solutions to a problem a character might be facing.
- Ask children what the character could do differently or ask them what they might do if they were in the place of the main character.
- As the book becomes familiar to the children, ask for volunteers to "read" it to you or small groups of children, letting them describe the pictures and the story in their own words.
- Compare and contrast books with similar content, themes or structures.
- Preview or review texts or parts of texts (particularly vocabulary) for children who need additional language or learning support.
- As children become more familiar with the story or information, use this as the beginning of extension activities like acting out a story, painting or drawing something inspired by the text, or creating puppet shows.

## Supporting Texts

**Astro Girl** by Ken Wilson Max: The stars are the limit for a little girl who acts out her wish to be an astronaut- inspired by a very special person.

**A Ray of Light: A Book of Science and Wonder** by Walter Wick: A photographic exploration into the beauty and magic of light.

**City Moon** by Rachael Cole: A little boy and his mom take a nighttime walk to search for the moon.

**Dump Truck Disco** by Skye Silver: Dump Truck Daisy and her construction vehicle crew are on a secret nighttime mission, build a playground before sunrise!

**Glow: Animals with Their Own Night-Lights** by W. H. Beck: Join world-renowned photographers and biologists on their close encounters with the curious creatures that make their own light.

**How Many Stars in the Sky?** by Lenny Hort: Mama is away one night, and when her son can't sleep, he tries to relax by counting stars, but the more of them he sees, the more determined he is to count every single one.

**In the Darkness of the Night** by Emily Rand: Listen to the neighborhood sounds that a young child hears while curled up, waiting to fall asleep.

**Little Owl's Day** by Divya Srinivasan: The sun is high in the sky. Little Owl is supposed to be asleep, but he wakes up early, he's just too curious to close his eyes again.

**Little Owl's Night** by Divya Srinivasan: It is evening in the forest and Little Owl wakes up from his day-long sleep to watch his friends enjoying the night.

**Max and the Tag Along Moon** by Floyd Cooper: Grandpa reminds Max that the moon above them at Grandpa's house is the same moon that will follow him all the way home.

**Ocean Sunlight: How Tiny Plants Feed the Seas** by Molly Band and Penny Chisholm: On land or in the deep blue sea, we are all connected- and we are all a part of a grand living landscape.

**Rocket Says Look Up!** by Nathan Bryon: A comet will be visible tonight and Rocket wants everyone to see it with her.

**Round Trip** by Ann Jonas: A trip to the city read from front to back and back to front.

**Shadow** by Suzy Lee: A dark attic, a light bulb, and an imaginative little girl.

**Shelter** by Céline Claire: As a big storm approaches, two strangers arrive in the forest. All the animal families, safe in their homes, are worried.

**Sources of Light** by Daniel Nunn: Sources of light all around us.

**The Night is Yours** by Abdul-Razak Zachariah: Amani plays an evening game of hide-and-seek with friends at her apartment complex. The moon's glow helps Amani find the last hidden child.

**What is Light?** By Markette Sheppard: Light can be so many things! The twinkle of a faraway star, a firefly captured in a jar, a mother's love...

**Windows** by Julie Denos: Walking his dog at dusk, one boy catches glimpses of the lives around him.

# VI. Inquiry and Critical Thinking Questions for Foundational Texts

Critical thinking skills are foundational to learning and educational success.

These questions are based around Webb's Depth of Knowledge Wheel<sup>1</sup>, which provides a vocabulary and critical thinking frame of reference when thinking about our children and how they engage with unit content.

Re-read foundational texts throughout the unit, starting with Level 1 questions, and adding more complex questions each time you read them.

## **All About Light by Lisa Trumbauer**

*PK.AL.4. Exhibits curiosity, interest, and willingness to learn new things and have new experiences*

### **Level 1: Recall**

What are some of the different sources of light in this book?

What happens when you turn on a lamp or a flashlight?

What are some of the things light can do?

### **Level 2: Skill/Concept**

How can the moon help us see?

Why do we turn on lights when it is dark?

### **Level 3: Strategic Thinking**

There are many different kinds of light in this book.

What kinds of lights are around us?

How does light help us?

### **Level 4: Extended Thinking**

What would happen if we did not have any light in our classroom? What would happen if you did not have any light where you live? What would you do?

Sometimes we want light around us. Sometimes we do not. When might you want it to be dark?

How can you make a space dark when it is light outside?

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<sup>1</sup> <http://schools.nyc.gov/NR/rdonlyres/522E69CC-02E3-4871-BC48-BB575AA49E27/0/WebbsDOK.pdf>

## **Blackout by John Rocco**

*PK.ELAL.5. [PKR.1.] Participates in discussions about a text (e.g., during whole or small group interactive read-aloud discussions, during peer sharing, within play scenarios)*

### **Level 1: Recall**

What did the family do when the lights went out?

What did the family find on the roof?

What did the family find on the street?

### **Level 2: Skill/Concept**

Why did everyone stop what they were doing when the lights went out?

How do you think the kid felt at the very first second when the lights went out?

At first it seemed like the kid was very \_\_\_\_ about the lights going out. How do you think they felt about it later?

What did the kid do when the lights came back on?

Why do you think they did that?

### **Level 3: Strategic Thinking**

When the lights went out the family stayed inside for a bit, went up to the roof and hung out with their neighbors, went to the party on the street, and ate ice cream together. Which thing that they did sounds like the most fun to you? Why?

In this story, the lights went out at night. What do you think might have been different about this story if the lights went out during the day? Why?

### **Level 4: Extended Thinking**

Do you prefer light or darkness? Why?

If you were home with your family or friends at night and the lights went out, what do you think the people in your family/your friends would say and do?

## **Kitten and the Night Watchman by John Sullivan**

*PK.SCI.7. [P-ESS1-1.] Observes and describes the apparent motions of the sun, moon, and stars to recognize predictable patterns*

### **Level 1: Recall**

What are some of the things the night watchman does at work?

What does the night watchman find at work?

What does the night watchman do with the kitten he finds at work?

### **Level 2: Skill/Concept**

When does the night watchman do his job?

When the night watchman starts working, it is sunny. What happens to the sun while the watchman is working?

### **Level 3: Strategic Thinking**

The night watchman works at night. When do you think he sleeps?

What would you think about working at night and sleeping during the day?

### **Level 4: Extended Thinking**

What types of light help the night watchman do his job?

What types of light help you? What do they help you do?

## ***Moonbear's Shadow by Frank Asch***

*PK.SCI.9. [P-PS3-1.] Participates in an investigation to determine the effect of sunlight on Earth's surface*

### **Level 1: Recall**

What was Bear doing when he first noticed his shadow?

Why did Bear want to get rid of his shadow?

What are some of the ways Bear tried to get rid of his shadow?

### **Level 2: Skill/Concept**

What makes shadows?

Why did Bear's shadow move when bear moved?

Is it possible to get rid of a shadow? Why or why not?

### **Level 3: Strategic Thinking**

Bear felt very annoyed when he could not get rid of his shadow. Are there things that make you feel annoyed? What are they?

Bear talked to his shadow. Can shadows listen? Can shadows answer questions? Why or why not?

### **Level 4: Extended Thinking**

When it was noon and the sun was high in the sky, Bear's shadow was gone. Why?

When can you see your shadow?

How can you make your shadow go away?

## VII. Sample Weekly Plan

On the following pages you will find a sample weekly lesson plan. Use the additional information included in the unit to create detailed weekly plans for each focus question in the unit. Plans will reflect individual schedules, students' and families' needs, school context, etc. Please note, for this unit we are introducing the daily schedule and rules development in Week Two. You may want to address one or both of these activities in Week One, depending on your children's needs.

### Quick Tips for Small Group:

1. Use exciting language and affect to describe the small group activity.
2. Use hands-on materials that children are encouraged to explore.
3. Preview small group activities in whole group.
4. Link the activity to children's previous experiences

If children decline...

Have a private conversation with the child as they play to understand why they did not want to join. Take that into consideration and adjust the small group materials to reflect the needs of the child.

Modify the small group activity so that you can do it with the materials that the child is using in the center of his/her choice.

Facilitate a conversation between the child and a friend who enjoyed the small group activity so that the hesitant child will be more likely to join

### WEEK ONE

#### Essential Question: How and why do we use different kinds of light?

**Focus Question:** What kinds of lights are around us?

**Focus Vocabulary:** candle, curve, electricity, fire, firefly, flame, flashlight, lamp lantern, light, light bulb, lightning, lines, moon, rainbow, stars, straight, street light, sun, traffic light

Week 4	Monday	Tuesday	Wednesday	Thursday	Friday
Greeting Routine	Continue to supply a table with child-sized pencils, crayons or other writing tools, half sheets of paper or large chart paper, and a basket of name/picture cards for each child (laminated cards with each child's picture and first name, with the first letter in red). Remind children to sign in if necessary and continue to encourage any mark children make according to each child's needs, but be ready to help children who are ready for an additional challenge by adding their last name or encouraging them to look closely at the model letters on their name card to improve accuracy. Observe children's writing and refer to the stages of prewriting (in Unit 3: All About Us) to determine what to expect next and how to best support the continued development of the child. This activity can be done as children arrive or later in the day. If children seem uninterested in signing in this manner, consider encouraging them to write their names throughout their play in Learning Centers. For example, children can add their own names to their artwork or create their own name cards to save their structures in the Block/Construction Center. <i>PK.ELAL.25. [PKL.1] Demonstrates command of the conventions of academic English grammar and usage when writing or speaking.</i>				

## WEEK ONE

### **Essential Question: How and why do we use different kinds of light?**

**Focus Question:** What kinds of lights are around us?

**Focus Vocabulary:** candle, curve, electricity, fire, firefly, flame, flashlight, lamp lantern, light, light bulb, lightning, lines, moon, rainbow, stars, straight, street light, sun, traffic light

Week 4	Monday	Tuesday	Wednesday	Thursday	Friday
<b>Large Group Meeting</b> <i>In order to reduce the amount of time that children spend in large group and ensure that children have enough time to engage in meaningful play, teachers should think strategically about other large group activities and whether they are essential to the day.</i>	<p>Read the Foundational Text <b>All About Light</b> by Lisa Trumbauer. Use the Inquiry and Critical Thinking Questions from Section VI to support the read aloud.</p> <p><b>PK.ELAL.5. [PKR.1.]</b> Participates in discussions about a text (e.g., during whole or small group interactive read-aloud discussions, during peer sharing, within play scenarios)</p> <p>See page 37 for lesson plan and Section IX for Inquiry and Critical Thinking Questions.</p>	<p>Revisit the Supporting Text, <b>Round Trip</b> by Ann Jonas. Rather than reading the words, look for the different types of lights included in the book. Ask children to point out the different types of lights they see in the book. Chart their responses.</p> <p><b>PK.ELAL.5. [PKR.1.]</b> Participates in discussions about a text (e.g., during whole or small group interactive read-aloud discussions, during peer sharing, within play scenarios)</p>	<p>Teach the children the song Mister Sun (see Section IX: Supporting Resources for Lyrics). Write out the words on chart paper and point to them as you sing the song. Sing the song multiple times and invite the children to sing with you.</p> <p><b>PK.ARTS.9. [MU:Pr4-6.PK]</b> Performs Music</p>	<p>Review the song Mister Sun with the children. Remind them that the sun is one type of light that is around us. Invite them to share other types of light that are around us. Record their responses.</p> <p>Sing the line, <i>Mister Sun, Sun Mister Golden Sun, Please shine down on me</i> with the children again multiple times, replacing <i>sun</i> with other types of light from the children's list.</p> <p>When children are selecting a type of light to sing about they could also decide if they would like to use the title Mr. or Ms. (e.g., Ms. Lamp, Mr. Flashlight).</p> <p><b>PK.ARTS.9. [MU:Pr4-</b></p>	<p>Write the word <i>light</i> large enough for the children to see it. Invite the children to think about English words that rhyme with the word <i>light</i>. Play with the suggestions children make and highlight how English words that rhyme all have the same ending sound and a different beginning sound. **This activity should be implemented in English.</p> <p><b>PK.ELAL.2. [PKRF.2.]</b> Demonstrates an emerging understanding of spoken words, syllables, and sounds (phonemes)</p>

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Week 4	Monday	Tuesday	Wednesday	Thursday	Friday
				6.PKJ Performs Music	
<b>Foundational Text</b>	<i>All About Light</i> by Lisa Trumbauer				
<b>Supporting Text</b>	<i>Round Trip</i> by Ann Jonas	<i>Astro Girl</i> by Ken Wilson-Max	<i>How Many Stars in the Sky?</i> by Lenny Hort	<i>What is Light?</i> by Markette Sheppard	<i>Windows</i> by Julia Denos
<b>Small Groups</b> Implement at least two of the three small group activities per week.	LITERACY SMALL GROUP  Draw various types of lines (straight, curved vertical, horizontal, etc.) on paper and place the paper on the light table. Invite children to trace the various lines and talk with them about their characteristics using vocabulary such as straight and curve. After children explore the lines, help them make comparisons to the lines in their names and	MATH SMALL GROUP  Draw shapes on pieces of paper, one shape per piece of paper. Begin with triangles, squares and circles and add other shapes as needed. Determine a place for children to stand and scatter the pieces of paper on the floor a few feet away from the children. Give each child a flashlight (you will need 4-5), suggest a shape and ask children to shine the flashlight on	SMALL GROUP #3  Ask children what they think the word <i>melt</i> means. Invite discussion and clarify misconceptions as necessary. Tell children that the sun is very hot and can heat things when it shines on them.  Ask children to think of some things that might melt in the sun. Record their responses.  Invite children to look around the classroom for an item they think	Between Monday and Thursday, implement two to three small group activities.  Write children's initials below:  Group 1:  Group 2:  Group 3:	CATCH-UP DAY  Use this as an opportunity to complete small groups with children you may have missed throughout the week.  Children to work with today (initials):

## WEEK ONE

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Week 4	Monday	Tuesday	Wednesday	Thursday	Friday
<b>Small Groups</b> <i>Small groups can be implemented during center time or at another time during the day. Invite 2-4 children to participate at a time. Although children are typically excited about</i>	<p>provide name cards for reference. Children who are already familiar with many types of lines can look for, and identify lines throughout the classroom.</p> <p>*To implement this activity without a light table, Consider using tracing paper, paper protectors or transparent file folders.</p> <p><i>PK.ELAL.1. [PKRF.1.] Demonstrates understanding of the organization and basic features of print</i></p> <p><i>Small groups can be implemented during center time or at another time during the day. Invite 2-4 children to participate at a time. Although children are typically excited about</i></p>	<p>the paper with the corresponding shape.</p> <p><i>PK.MATH.13. [NY-PK.G.2.] Names shapes regardless of size</i></p> <p>Write children's initials below:</p> <p>Group 1:</p> <p>Group 2:</p> <p>Group 3:</p> <p>Group 4:</p> <p>Group 2:</p>	<p>might melt in the sun. Place the items in a muffin tin (one item per space) and place the muffin tin in a sunny place. Leave the items in the tin for an extended period of time; encourage children to monitor the experiment throughout the day.</p> <p>Place a chart with two columns, one titled Yes and one titled No, near the muffin tin. Invite children to monitor the experiment and record the results..</p> <p>Share results with the children at the end of the day.</p> <p>Suggestions for items to try: butter, chocolate, crayons and ice.</p> <p><i>PK.SCI.9. [P-PS3-1.] Participates in an</i></p>	<p>Group 4:</p> <p>Group 5:</p>	

## WEEK ONE

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Week 4	Monday	Tuesday	Wednesday	Thursday	Friday
<p><i>the opportunity to work closely with a teacher, children may decline the opportunity to participate. Each small group should not exceed 10 minutes in length. Work with a couple of groups per day and spend the remainder of the time engaging with children in the interest areas.</i></p>	<p>Group 3:  Group 4:  Group 5:</p>	<p>Group 5:</p>	<p><i>investigation to determine the effect of sunlight on Earth's surface</i>  Write children's initials below:  Group 1:  Group 2:  Group 3:  Group 4:  Group 5:</p>		

## WEEK ONE

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Week 4	Monday	Tuesday	Wednesday	Thursday	Friday
<b>Outdoors</b>	See Section IV, Ideas for Learning Centers.				
<b>Lunch</b>	Translucent or Opaque? Discuss the food the children are eating. Are the foods translucent or opaque?				
<b>Centers</b>	See Section IV, Ideas for Learning Centers.				
<b>Opportunities for differentiation and integration of goals for children with IEPs</b>	To be completed as needed by teachers.				
<b>Differentiation for children whose home language is a language other than English.</b>	To be completed as needed by teachers.				

## VIII. Student Work Samples

Below are examples of student work from activities in this unit. Note the alignment to standards and the relationship to the focus question and PKFCC standard. Some examples may fit under more than one standard and/or focus question.

## Example 1: My Shadow Does That Too!

## Activity Type: Outdoors

*PK.SCI.9. [P-PS3-1.] Participates in an investigation to determine the effect of sunlight on Earth's surface.*



## Example 2: Sun Stains

Activity Type: Learning Centers

*PK.SCI.9. [P-PS3-1.] Participates in an investigation to determine the effect of sunlight on Earth's surface.*



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*"I used only straight lines. I was making an N but then I turned it and I actually made a Z. Z is one of mine. I think when I leave it in the sun magic is going to happen."*

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*"I was trying to do my name. H only has straight lines but U has a curve and a straight. After that, I ran out of space. Now I leave it here in this sunny spot by the window until tomorrow. I think something cool is gonna happen."*

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# IX. Supporting Resources

## Teacher Texts

- Growing Minds: Building Strong Cognitive Foundations in Early Childhood* by Carol Copple, ed  
*Play, Projects and Preschool Standards: Nurturing Children's Sense of Wonder and Joy in Learning* by Gera Jacobs & Kathy Crowley

## Teacher Websites

- Science World of British Columbia. Information on reflections and shadow.  
[http://www.scienceworld.ca/sites/default/files/BSLH\\_shadow\\_final.pdf](http://www.scienceworld.ca/sites/default/files/BSLH_shadow_final.pdf)
- American Museum of Natural History Hayden Planetarium  
<http://www.amnh.org/learn-teach/grades-3-5/hayden-planetarium-programs>
- \*NYC Encounters with Reggio Emilia  
<http://www.newyorkcitywol.org/>

- \*The Wonder of Learning: Ray of Light  
[http://www.thewonderoflearning.com/exhibition/luce/?lang=en\\_GB](http://www.thewonderoflearning.com/exhibition/luce/?lang=en_GB)

- National Science Teachers Association- Early learning experiences build toward understanding concepts that are hard to teach  
<http://nstacommunities.org/blog/2012/09/27/early->

[learning-experiences-build-toward-understanding-concepts-that-are-hard-to-teach/](http://www.nyc.gov/html/dot/html/infrastructure/signals.shtml)

Traffic Signals: New York City Department of Transportation  
<http://www.nyc.gov/html/dot/html/infrastructure/signals.shtml>

\*Programs are NOT required to adopt the Reggio Emilia approach. These sites include helpful information on exploring light.

## Music: Songs with Lyrics

These are common preschool songs sung by teachers throughout New York City and the world. Where possible, tunes and lyrics are included. If you don't know the tune, you can make one up that works for you or chant the words to a beat. Disclaimer: the lyrics provided are only for use by classroom teachers and are provided for the specific, non-profit educational purpose of supporting interdisciplinary learning in your classroom.

### Twinkle, Twinkle, Little Star

Twinkle, twinkle, little star  
 How I wonder what you are.  
 Up above the world so high,  
 Like a diamond in the sky.  
 Twinkle, twinkle, little star,  
 How I wonder what you are.

### Mister Sun

Oh Mister Sun, Sun,  
 Mister Golden Sun,  
 Hiding behind a tree...

These little children  
 Are asking you  
 To please come out  
 So we can play with you

Oh Mister Sun, Sun,  
 Mister Golden Sun,  
 Please shine down on me!  
 Oh Mister Sun, Sun,  
 Mister Golden Sun,  
 Please shine down on...  
 Please shine down on...  
 Please shine down on me!

### Additional Song Titles

May There Always be Sunshine  
 Moon, Moon, Moon  
 You Are My Sunshine  
 Hey Diddle Diddle

## X. Foundational Learning Experiences: Lesson Plans

**Documentation:** Based on the Focus Question, Objective, and Focus Standard as well as the Authentic Assessment items, teachers will determine what they hope to see children do in an activity. They should take notes as children are working to record the skills and growth children demonstrate. For the lesson plans included in this unit, a note-taking form is included. Please note the PKFCC standards and assessment items listed in each lesson plan. Keep in mind that you may be addressing additional assessment items and standards.

### Lesson: *All About Light* by Lisa Trumbauer

Type: Foundational Text Read Aloud

<b>Unit of Study:</b> Light	<b>Focus Question:</b> What kinds of lights are around us?
<b>Objective:</b> Children will answer questions about the text.	
<b>PKFCC Focus Standard:</b> <i>PK.ELAL.5. [PKR.1.] Participates in discussions about a text (e.g., during whole or small group interactive read-aloud discussions, during peer sharing, within play scenarios)</i>	<b>Link to Authentic Assessment Systems:</b> WWS: II.C.4: Recounts some key ideas and details from text TSG: 18a: Interacts during read alouds and book conversations COR: M: Listening and comprehension
<b>Additional PKFCC Standard:</b> <i>PK.ELAL.12. [PKR.9] Makes connections between self, text, and the world (e.g., what is familiar, what does an event/picture/character make them think of, what do they remember)</i>	
<b>Materials:</b> <i>All About Light</i> by Lisa Trumbauer, light bulb	<b>Vocabulary:</b> candle, curve, electricity, fire, flashlight, lamp light, light bulb, moon, rainbow, sun
<b>Procedure:</b> <b>Hook:</b> Show the children the light bulb. Point out the different parts of the bulb. <b>Beginning:</b> Share the title of the book.	

Unit of Study: Light	Focus Question: What kinds of lights are around us?
Share the author's name as well as the illustrator's name.	
Ask the children what they think this book is about.	
<b>Middle:</b>	
Read the book to the children.	
Pause throughout the book to ask the questions suggested in Section IX. Use these questions to engage in discussion with the children.	
<b>End:</b>	
After reading this book, invite children to look for light bulbs in the classroom, or in other parts of the building. Support them in comparing and contrasting the bulbs they find with the bulb you showed them.	
<b>Assessment:</b> What questions about the text is the child able to answer?	
<b>Differentiation:</b> Consider multiple entry points for all children to be successful. How do I/we plan to meet individual student needs? For example, repeat directions, extend time, adapt materials, preview questions, and provide 1:1 support.	
<b>For children who need additional support:</b> Read a few pages in the story rather than reading the entire book. Invite these children to sit next to a teacher.	
<b>For children who are ready for a challenge:</b> Invite these children to look carefully at the illustrations in the book and try to create their own picture that can be turned upside down.	
<b>Children with IEPs:</b> How will I incorporate individual children's IEP goals into this lesson? What specific accommodations or modifications will I make? How will I collaborate with SEIT and/or related service providers?	
<b>Children whose home language is a language other than English:</b> What language is needed to understand the lesson and activity instructions and to participate in the activity and discussion?	
Point to the pictures in this book as you talk about what you see.	
<b>Teacher Tip:</b> Be very careful when handling the light bulb. Be sure to keep it in a safe place, out of children's reach before and after this activity. See Appendix XI Appendices for a simple light bulb diagram.	
<b>Teacher Reflection:</b> What went well? Why? What will I do differently given what I have learned from observing children during this activity? Which children needed differentiation during this activity and how will I meet their needs moving forward?	

## Assessment Opportunity

Foundational Text Read Aloud: *All About Light*

### PKFCC Focus Standard

*PK.ELAL.5. [PKR.1.] Participates in discussions about a text (e.g., during whole or small group interactive read-aloud discussions, during peer sharing, within play scenarios)*

### Authentic Assessment Alignment

WSS: II.C.4: Recounts some key ideas and details from text  
TSG: 18a: Interacts during read alouds and book conversations  
COR: M: Listening and comprehension

Child's name	What questions about the text is the child able to answer?	Notes

Child's name	What questions about the text is the child able to answer?	Notes

## Lesson: The Starry Night

Type: Whole Group

Unit of Study: Light	Focus Question: What is darkness?
<b>Objective:</b> Children will reflect on a piece of visual art.	
<b>PKFCC Focus Standard:</b> <i>PK.ARTS.18. [VA:Re7-9.PK] Responds to Visual Arts</i> <b>Additional PKFCC Standard:</b> <i>PK.AC.3 Demonstrates understanding of what is observed</i>	<b>Link to Authentic Assessment Systems:</b> WSS: VI.B.1: Responds to artistic creations or events TSG: 33: Explores the visual arts COR: X: Art
<b>Materials:</b> Vincent van Gogh's The Starry Night painting or another art piece involving light that may be more responsive to the classroom community (see Section XI Appendices).	<b>Vocabulary:</b> dark, light, moon, night, stars (words may vary depending on the art selected)
<b>Procedure:</b> <b>Hook:</b> Hang the print at the children's eye level in a highly visible place in the classroom. Invite children to look at the painting prior to this activity. Children can take a moment to observe the art during a transition, at arrival or departure, etc. <b>Beginning:</b> Bring the picture to the group area. Show it to the children and remind them they have looked at this picture before. Tell children this painting is called <u>(The Starry Night)</u> and an artist named <u>(Vincent van Gogh)</u> <u>(painted)</u> it. <b>Middle:</b> Invite children to take some time to look at this painting again. Invite them to reflect on the art following questions: (e.g., What do you notice about the painting? Where do you see light in this art? What colors do you notice? What might these colors mean? What does the title of the painting tell us? How does the painting make you feel?). <b>End:</b> Summarize the discussion about the painting and children's responses. <b>Assessment:</b> What does the child share that indicates they are able to reflect on the artwork?	

**Unit of Study: Light**
**Focus Question: What is darkness?**

**Differentiation:** Consider multiple entry points for all children to be successful. How do I/we plan to meet individual student needs? For example, repeat directions, extend time, adapt materials, preview questions, and provide 1:1 support.

**For children who need additional support:** In advance, find a time to help these children notice the painting with you and share their observations to prepare for the group activity.

**For children who are ready for a challenge:** Talk about the artist, van Gogh, and share a few of his other paintings with these children. Ask them to compare and contrast the paintings.

**Children with IEPs:** How will I incorporate individual children's IEP goals into this lesson? What specific accommodations or modifications will I make? How will I collaborate with SEIT and/or related service providers?

**Teacher Tip:** Calling children's attention to the art before the group activity and discussing it briefly with them will provide some time to think about the painting and will lead to a richer discussion.

**Teacher Reflection:** What went well? Why? What will I do differently, given what I have learned from observing children during this activity? Which children needed differentiation during this activity and how will I meet their needs moving forward?

## Assessment Opportunity

### Whole Group Experience: The Starry Night

PKFCC Focus Standard  
*PK.ARTS.18. [VA:Re7-9.PK] Responds to Visual Arts*

Authentic Assessment Alignment  
 WSS: VI.B.1: Responds to artistic creations or events  
 TSG: 33: Explores the visual arts  
 COR: X: Art

Child's name	Reflections Shared	Notes

Child's name	Reflections Shared	Notes

# Lesson: Light Helps Plants Grow

Type: Small Group Activity

Unit of Study: Light	Focus Question: How does light help us?
<b>Objective:</b> Children will understand that lights help plants grow.	
<b>PKFCC Focus Standard:</b> <i>PK.SCI.9.[P-PS3-1.] Participates in an investigation to determine the effect of sunlight on Earth's surface.</i> <b>Additional PKFCC Standard:</b> <i>PK.SCI.4.[P-LS1-1.] Observes familiar plants and animals (including humans) and describes what they need to survive</i>	<b>Link to Authentic Assessment Systems:</b> WSS: IV.D.1: Observes the sky and the natural and human-made objects in it TSG: 27: Demonstrates knowledge of the Earth's environment COR: DD: Natural and physical world
<b>Materials:</b> Seeds, small containers for planting, soil, light and dark areas for storing planted seeds, chart paper, markers	<b>Vocabulary:</b> dark, grow, heat, light
<b>Procedure:</b> <b>Hook:</b> Show children a plant, ideally a live plant but if necessary a picture of a plant. <b>Beginning:</b> Share that plants are living organisms that grow. Ask children what they think plants need to grow. Guide the discussion, making sure to note that plants need light to grow. <b>Middle:</b> Share that the children will be invited to plant a seed. Discuss how to plant a seed. Allow children to plant their seeds and assist as necessary. Determine two places for children to store their plants, one in the dark and one in the light. Invite children to consider the both options and decide where they would like to place their plant. Allow children to put their plants in the appropriate space per their decision.	

Unit of Study: Light	Focus Question: How does light help us?
<p><b>End:</b></p> <p>Store the children's plants in the designated areas for a period of time.</p> <p>Invite children to monitor the plants periodically and water them.</p> <p>At the conclusion of the experiment, graph the results. Create a graph with the columns <i>light</i> and <i>dark</i> and tally how many plants grew in the dark place and how many plants grew in the light place.</p>	
<p><b>Assessment:</b> What does the child understand about plant growth and the role of light?</p>	
<p><b>Differentiation:</b> Consider multiple entry points for all children to be successful. How do I/we plan to meet individual student needs? For example, repeat directions, extend time, adapt materials, preview questions, and provide 1:1 support.</p>	
<p><b>For children who need additional support:</b> Take pictures of the plants a few times throughout the experiment. Create a chart or book to solidify the learning.</p>	
<p><b>For children who are ready for a challenge:</b> Increase the complexity of the experiment by choosing some plants to water more, and some less. Keep track of the amount of water given to each plant and record the results on the plants' growth.</p>	
<p><b>Children with IEPs:</b> How will I incorporate individual children's IEP goals into this lesson? What specific accommodations or modifications will I make? How will I collaborate with SEIT and/or related service providers?</p>	
<p><b>Teacher Tip:</b></p> <p>If potting soil is not available, seeds can be grown in a transparent plastic glove or small plastic baggie. Place a wet cotton ball in the finger of a glove, add a seed and hang up the glove.</p> <p>The plants will also need to be watered.</p> <p>Check labels on soil mixtures to ensure the soil is safe for children.</p> <p>Be sure children wash their hands after handling soil and planting seeds.</p>	
<p><b>Teacher Reflection:</b> What went well? Why? What will I do differently, given what I have learned from observing children during this activity? Which children needed differentiation during this activity and how will I meet their needs moving forward?</p>	

## Assessment Opportunity

### Small Group Experience: Light Helps Plants Grow

**PKFCC Focus Standard**

*PK.SCI.9. [P-PS3-1.] Participates in an investigation to determine the effect of sunlight on Earth's surface.*

**Authentic Assessment Alignment**

WSS: IV.D.1: Observes the sky and the natural and human-made objects in it

TSG: 27: Demonstrates knowledge of the Earth's environment

COR: DD: Natural and physical world

Child's name	What does the child understand about plant growth and the role of light?	Notes

Child's name	What does the child understand about plant growth and the role of light?	Notes

Child's name	What does the child understand about plant growth and the role of light?	Notes

## Lesson: My Shadow Does That Too!

Type: Outdoor Experience

Unit of Study: Light	Focus Question: What are shadows?
<b>Objective:</b> Children will begin to understand that shadows are created when light is blocked.	
<b>PKFCC Focus Standard:</b> <i>PK.SCI.9. [P-PS3-1.] Participates in an investigation to determine the effect of sunlight on Earth's surface.</i>	<b>Link to Authentic Assessment Systems:</b> WWS: IV.B.3: Explores and describes light and sound TSG: 27: Demonstrates knowledge of the Earth's environment COR: DD: Natural and physical world
<b>Additional PKFCC Standard:</b> <i>PK.ARTS.1. [DA:Cr1-3.PK] Creates Dance</i>	
<b>Materials:</b> Space for children to see their shadows, camera (if available), paper, writing utensils	<b>Vocabulary:</b> opaque, light, dark, shadow, sun
<b>Procedure:</b> <b>Hook:</b> Dance or move excitedly and invite children to look at your shadow. <b>Beginning:</b> Invite children to dance or move with you. Point out to the children how their shadow moves as they dance. <b>Middle:</b> Ask children to stop moving and pose for a shadow picture. Take a picture of each child's shadow. <b>End:</b>	

Unit of Study: Light	Focus Question: What are shadows?
<p>Ask children to tell you about their shadow and how shadows are made. If possible, engage in a discussion with them around their ideas.</p> <p>Record student's responses.</p> <p>Display the pictures of children's shadows with their dictations in the classroom.</p>	
<p><b>Assessment:</b> What does the child understand about shadows?</p>	
<p><b>Differentiation:</b> Consider multiple entry points for all children to be successful. How do I/we plan to meet individual student needs? For example, repeat directions, extend time, adapt materials, preview questions, and provide 1:1 support</p>	
<p><b>For children who need additional support:</b> Ask questions to prompt a response from these children and extend their thinking. Remember, children will be at different points in their understanding and ability to articulate their thoughts. Your dictation should record exactly what the child says.</p>	
<p><b>For children who are ready for a challenge:</b> Ask these children to use their bodies to try make lines and/or shapes related to the unit vocabulary (straight, zigzag, etc.).</p>	
<p><b>Children with IEPs:</b> How will I incorporate individual children's IEP goals into this lesson? What specific accommodations or modifications will I make? How will I collaborate with SEIT and/or related service providers?</p>	
<p><b>Teacher Tip:</b> If a camera is not available, trace each child's shadow on a large piece of butcher paper.</p> <p>Prior to implementing this activity select a location and time of day that is conducive to creating and viewing shadows.</p>	
<p><b>Teacher Reflection:</b> What went well? Why? What will I do differently given what I have learned from observing children during this activity? Which children needed differentiation during this activity and how will I meet their needs moving forward?</p>	

## Assessment Opportunity

Outdoor Experience: My Shadow Does That Too!

**PKFCC Focus Standard**  
*PK.SCI.9. [P-PS3-1.] Participates in an investigation to determine the effect of sunlight on Earth's surface.*

**Authentic Assessment Alignment**

WSS: IV.B.3: Explores and describes light and sound  
 TSG: 27: Demonstrates knowledge of the Earth's environment  
 COR: DD: Natural and physical world

Child's name	What does the child understand about shadows?	Notes

Child's name	What does the child understand about shadows?	Notes

Child's name	What does the child understand about shadows?	Notes

## XI. Appendices

### Appendix A: Teacher-made Light Table

#### Version One

##### Materials:

Clear storage box with top

White tissue paper

Clear tape

String of small lights

##### Directions:

Tape the white tissue paper to the bottom side of the top of a clear storage box.

Place the string of small lights inside the box. Allow the end of the lights to hang out of the box in order to plug in the lights.

Invite children to place materials on top of the box to explore and play.

#### Version Two

##### Materials:

Plastic drawer with a translucent white top

4-6 battery powered lights (depending on the size of the drawers)

##### Directions:

Turn on the lights.

Place the lights inside the drawer and close.

Invite children to place materials on top of the box to explore and play.





## Appendix B: Speaking to Children about Vision Loss

Some people are born without the sense of sight or experience a loss of sight. This can make it difficult to do some things because they may not see things clearly or may need to have pictures or writing made big for them to see. Imagine not being able to see a toy from far away—only being able to see it when it is up close to you. Some people who experience a loss of sight may only be able to tell the difference between light and dark. Imagine darkness with a little bit of light or shadows. People who experience loss of vision may walk using white canes, people or dogs to guide them. They can also read using Braille which is an alphabet of raised dots that can be read with fingers.

## Appendix C: Finger Shadow Puppets

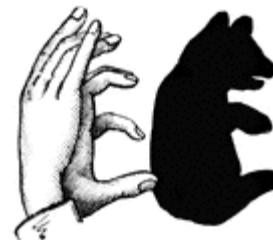
<http://etc.usf.edu/clipart/galleries/266-hand-shadow-puppetry>



Butterfly



Dog



Teddy Bear



Pig

## Appendix D: Teacher-made Shadow Puppet Theater

### Materials:

- Empty cereal box or other cardboard box
- Marker
- Scissors or craft knife
- Tape
- 1 sheet of fairly thin white paper or wax paper

### Directions:

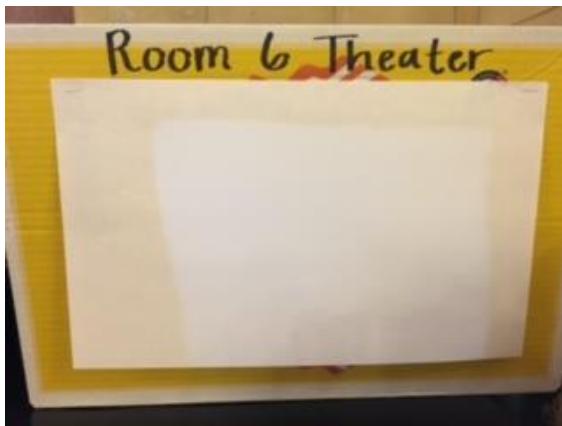
Wrap the sides of the cereal box with tape until the box is sturdy.

Trace a border about 1 inch from the edge of the cereal box on both large faces creating two large rectangles.

Cut out the large rectangles.

Tape the paper to the box to cover one of the large rectangles.

Shine a light behind the box and use puppets to create shadows.



## Appendix E: Art

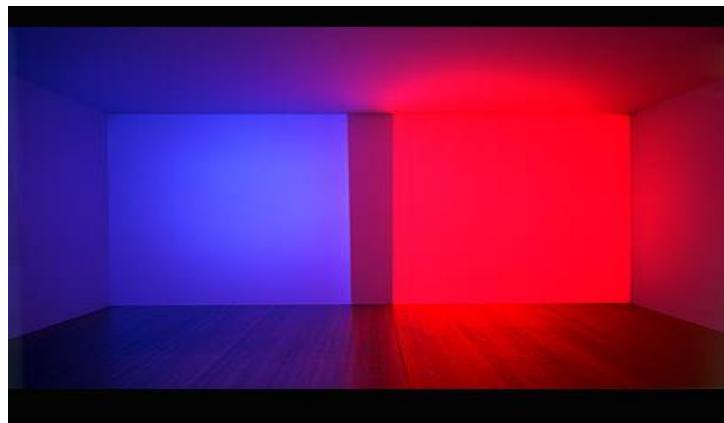
*The Starry Night* painting by Vincent van Gogh is used in several activities in this Unit. Other art or artists may be more responsive to the classroom community. The following art can be used instead of *The Starry Night*, however this is not an exhaustive list and further research may be required to find the best art for your class.



Yayoi Kusama, Infinity Mirrored Room- The Souls of Millions of Light Years Away, 2013



Rafael Lozano-Hemmer, Articulated Intersect, 2011



James Turrell, Orca, Blue-Red, 1969



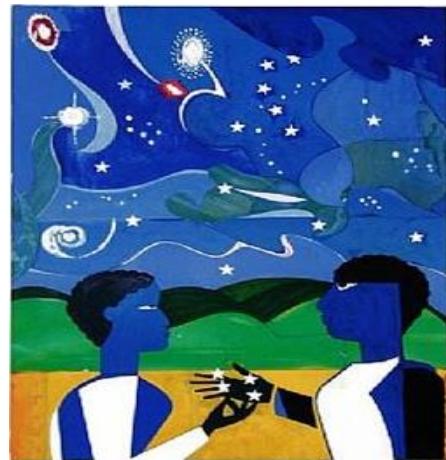
Light Sculpture by Iván Navarro



Shamsia Hassani Afghan Graffiti Artist



Vincent van Gogh, The Starry Night ,1889



Romare Bearden, Two Worlds/Faces of the Future, 1980



Carmen Lomas Garza, Tito's Gig on the Moon, 2002



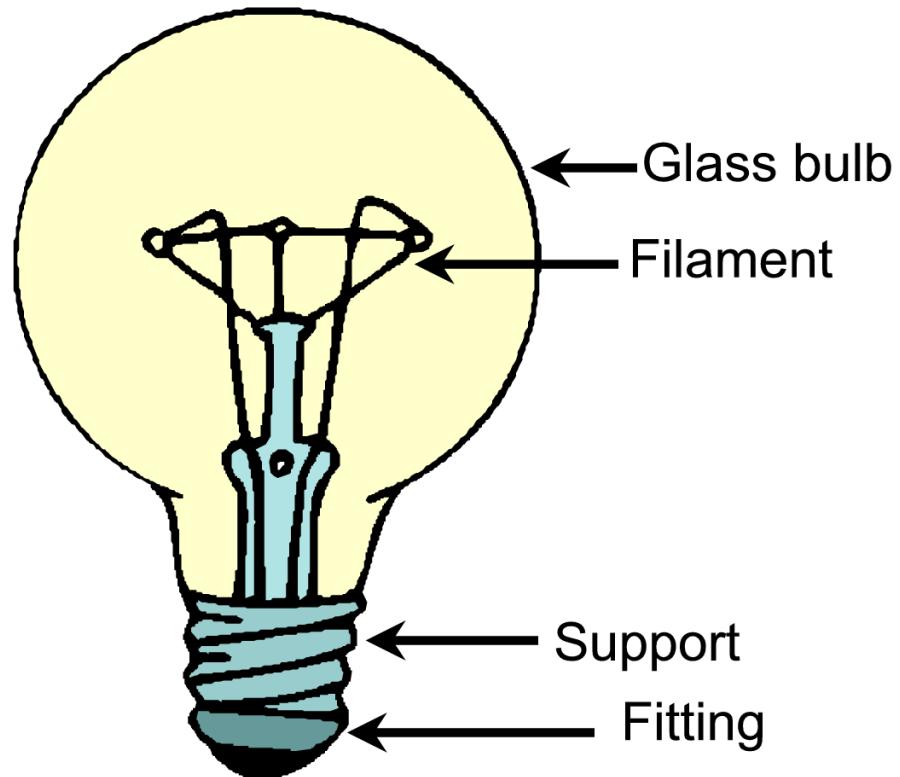
Michael Kenna, Chrysler Building, Study 2, New York, New York, USA, 2006



Frédéric Auguste Bartholdi, Statue of Liberty, dedicated 1886

## Appendix F: Simple Light Bulb Diagram

Light bulb



<https://cnx.org/contents/OaPHrzsE@1.1:KVBUNVSV@1/Electric-Circuits>