

PRE-K
FOR ALL

Light
Interdisciplinary Unit of Study
NYC DOE

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The left side of the page features a large, semi-transparent orange overlay. Behind this overlay is a photograph of a young child with dark hair, looking down at a small object in their hands. The child is wearing a dark jacket. The overall tone is warm and educational.

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I. Unit Snapshot: Goals and Standards

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:

What the student should understand by the end of the unit.

Enduring Understandings:

- 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 best fit the needs of individual programs and classrooms.

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

Focus Standards from the Prekindergarten Foundation for the Common Core (PKFCC):

Domain 1 Approaches to Learning:

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

Domain 2 Physical Development and Health:

PDH.1 Uses senses to assist and guide learning.

PDH.3 Demonstrates coordination and control of large muscles.

PDH.9 Demonstrates awareness and understanding of safety rules.

Domain 4: Communication, Language and Literacy:

Approaches to Communication

CLL.5 Demonstrates a growing receptive vocabulary.

Reading Standards for Informational Text

CLL.1 With prompting and support, ask and answer questions about details in a text.

Reading Standards: Foundational Skills

CLL.1 Demonstrate understanding of the organization and basic features of print.

Language Standards

CLL1 Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

CLL.5 With guidance and support, explore word relationships and nuances in word meanings.

Domain 5: Cognition and Knowledge of the World

Mathematics

PK.CKW.2 (Operations and Algebraic Thinking): Duplicate and extend (e.g., what comes next?) simple patterns using concrete objects.

Science

PK.CKW.4 Observes and describes characteristics of earth and space.

PK.CKW.6 Acquires knowledge about the physical properties of the world.

The Arts

PK.CKW.5 Participates in a variety of dramatic play activities to represent fantasy and real life experiences.

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 man-made 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, but you can find information in Section XI: Appendices on how you can create your own 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.

All 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 week’s question, “What kinds of light are around us?” Children will observe, discuss and explore what they know about natural and man-made light. In the second week children will have learning experiences and 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 made up 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 VIII, or other accurate resources for background science knowledge on light.

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 new 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

Unit Topic	Light
<p>Essential Question This is a child-friendly question that connects the knowledge and skills that children should develop throughout the unit.</p>	<ul style="list-style-type: none"> • How and why do we use different kinds of light?
<p>Enduring Understandings These are the big ideas that children should remember throughout their educational careers and extend beyond the unit topic.</p>	<ul style="list-style-type: none"> • 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.

	Week One	Week Two	Week Three	Week Four
<p>Focus Questions These questions 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.</p>	<p>What kinds of lights are around us?</p>	<p>What is darkness?</p>	<p>How does light help us?</p>	<p>What are shadows?</p>
<p>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 Question.</p>	<p><i>Foundational Text Read Aloud</i></p> <p><u>Round Trip</u> by Ann Jonas</p> <p><i>PK.CLL.1 (Reading Standards for Literature): With prompting and support, ask and answer about details in a text.</i></p> <p>See page 36 for lesson plan.</p>	<p><i>The Starry Night</i></p> <p>Show children Vincent Van Gogh’s <i>The Starry Night</i> painting and allow them time to think about and respond to the art. Select some questions to help them think critically about the painting and their reactions to it (e.g., What do you notice about the painting? How does the painting make you feel? What do you see in the picture? What colors do you see? What might these colors mean? What does the title of the painting tell us?).</p> <p><i>PK.CKW.2 (The Arts): Responds and react to</i></p>	<p><i>Light Helps Plants Grow</i></p> <p>Plant seeds with the children. 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.CKW.4 (Science): Observes and describes characteristics of earth and space.</i></p>	<p><i>My Shadow Does That Too!</i></p> <p>Point children’s shadows out to them. Show them how their shadows move in the same way and at the same time they do. Encourage children to watch their shadows as they move their bodies. 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.CKW.4 (Science): Observes and describes characteristics of earth and space.</i></p> <p>See page 49 for lesson plan.</p>

		<i>visual arts created by themselves and others.</i> See page 40 for lesson plan.	See page 44 for lesson plan.	**Teachers are never advised to use their personal devices to take photos or videos.
<p>Foundational Texts These are a combination of literary and informational texts that can be read throughout the unit. See Section IX for text-based critical thinking questions to support the read aloud experience.</p> <p>PK.CLL.5 (<i>Reading Standards for Literature</i>): <i>Students interact with a variety of common types of texts.</i></p> <p><i>*Books with an asterisk are also available in languages other than English.</i></p>	<u>Round Trip</u> by Ann Jonas	<u>Can't You Sleep Little Bear?</u> by Martin Waddell	<u>All About Light</u> by Lisa Trumbauer	<u>Moonbear's Shadow</u> by Frank Asch
<p>Rich, informative and literary texts provide opportunities for learning, expression, imagination and critical thinking that are enhanced through multiple readings of the same book. Reading books multiple times helps all children solidify their thinking about content areas and builds their confidence as learners and as future readers. When you have a rich text that truly 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:</p> <ul style="list-style-type: none"> • 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. • Pause throughout the book and ask children to share a new word or idea they heard. • 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. • Preview or review texts or parts of texts 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. 				

<p>Key Vocabulary</p> <p>These are academic vocabulary words that help children understand the unit focus questions and access complex texts. These words can be supplemented by additional vocabulary in read alouds.</p>	<p>candle curve electricity fire firefly flame flashlight lamp lantern light light bulb lightning lines moon rainbow stars straight street light sun traffic light</p>	<p>clouds dark diurnal horizontal night nocturnal opaque shade sunglasses transparent translucent vertical</p>	<p>batteries day eyes eyesight grow heat night melt mirror reflection see sight solar power spiral zigzag</p>	<p>parallel shadow silhouette outline weather wavy</p>
<p>Family and Community Engagement</p> <p>These are ideas for inviting families to share their experience and knowledge with the class, or for extending learning outside of the classroom. Each activity is aligned to the PQS.</p>	<p>Black and white pictures: After reading the book, <u>Round Trip</u> by Ann Jonas, in class, send children home with a piece of black paper and a piece of white paper and invite them to create a picture with these two pieces of paper 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</p>	<p>Dark or light? 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 as well as why or why not. <i>Primary Teacher</i></p>	<p>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.</p> <p>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. <i>Primary Teacher</i></p>	<p>Finger shadow puppets: Invite children and families to use a flashlight, lamp or sunny window to create finger shadow puppets together at home by putting their hands in various positions in front of a light source 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.</p>

	<p>pictures. Ask families to return the pictures to you with a brief description of the art, then display in the classroom. <i>Two-Way Communication</i></p>			<p>See Section XI: Appendices for sample puppets. <i>Primary Teacher</i></p>
<p>Culminating Experience 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.</p>	<p>Plan a light show with the children. Talk about what a light show might look like and sound like, and who they would like to invite. Choose one piece of music (or more) as a group and have each child who wants to participate practice using a flashlight to shine on a white sheet, white wall or ceiling and move the light around as the music plays. Create a name for the show and make invitations for other children, families and/or staff members. Turn off the lights, play the music, and have fun. OR Do shadow puppet shows. Spend several days creating stories with the class in small groups. Each group can create puppets for their shadow play. 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. **Program Quality Standard (PQS) Eight, “Engaging Children in Meaningful Activity,”** highlights the necessary balance between adult and child-initiated learning experiences as well as some ways teaching staff can enhance children’s learning in center play. 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 PKFCC and is woven into many of the Program Quality Standards. 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 **PKFCC Standard PK.AL.1 (Actively and confidently engages in play as a means of exploration and learning)**. This same play helps children develop the background knowledge of **PKFCC Standard PK.CLL.4 (Demonstrates s/he is 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. PKFCC 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	Dramatic Play
<ul style="list-style-type: none"> • Critical thinking questions/statements: Tell me about your work. You just ___; what would happen if you ___? Why? How do you know? What is your prediction? What is your conclusion? • 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. <i>PK.AL.1 Actively and confidently engages in play as a means of exploration and learning.</i> • Traffic lights: Add small traffic light and traffic signal toys (or make your own) for children to use in their building. <i>PK.PDH.9 Demonstrates awareness and understanding of safety rules.</i> • Building shadows: Tape paper to the walls in the Blocks/Construction Center. Invite children to build in front of the paper, then shine a flashlight on the structure. 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. <i>PK.CKW.1 (Science): Asks questions and makes predications based on observations and manipulation of things and events in the environment.</i> • 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. <i>PK.AL.4 Exhibits curiosity, interest, and willingness in learning new things and having new experiences.</i> 	<ul style="list-style-type: none"> • 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...? • Sunglasses: Add a basket of sunglasses to the Dramatic Play Center. Talk with the children about when and why they might wear sunglasses. <i>PK.CKW.4 (Science): Observes and describes characteristics of earth and space.</i> • 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. <i>PK.AL.3 Approaches tasks, activities and problems with creativity, imagination and/or willingness to try new experiences or activities.</i> • 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. <i>PK.CKW.5 (The Arts): Participates in a variety of dramatic play activities to represent fantasy and real life experiences.</i> • Suggested Text: <u>I Took the Moon for a Walk</u> by Carolyn Curtis. Invite children to take their own journey with the moon.

- Shadow letters: Invite children to explore how they might use blocks and a flashlight to create shadow letters. How can they build letter structures that will produce a letter shadow?
PK.AL.2 Actively engages in problem solving.
✓ Opportunity for Assessment
 Does the child try multiple ways to create letters? Why or why not? Can the child share how s/he figured out how to create shadows in the form of letters?
- 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 to create a homemade set of window blocks.
PK.AL.3 Approaches tasks, activities and problems with creativity, imagination and/or willingness to try new experiences or activities.
- Skyline: Add pictures of the NYC skyline at night 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.CKW.4 (Science): Observes and describes characteristics of earth and space.
- Light table: Use translucent rulers to create ramps on the light table. Invite children to drive cars down the ramps. Connect to children’s previous experiences with ramps in **Unit 5: Transportation**.
PK.CKW.6 (Science): Acquires knowledge about the physical properties of the world.
- Suggested Text: [Bright Lights and Shadowy Shapes](#) by Jennifer Waters. Use this book to support children’s learning as they explore the shadows their structures create.

Art

- Critical thinking questions/statements: 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?

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?

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| <ul style="list-style-type: none"> • Pipe cleaner art: Invite children to create designs with pipe cleaners by twisting and bending them together. Hang the art in the classroom in front of a blank wall. Shine a light behind the artwork, noting 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?
 <i>PK.CLL.5 (Approaches to communication): Demonstrates a growing receptive vocabulary.</i>
 ✓ Opportunity for Assessment
 Is the child able to answer questions about the different types of lines in s/he sees? Is s/he able to identify any of the lines related to words? (Do you see a spiral line? Show me.) • Stained glass windows: Provide tissue paper and contact paper or clear container lids. Invite children to use the tissue paper to create designs and place them on the contact paper or lid. If using lids, supply glue as well and 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.
 <i>PK.CKW.4 (Science): Observes and describes characteristics of earth and space.</i> • 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.
 <i>PK.PDH.5: Demonstrates eye-hand coordination and dexterity needed to manipulate objects.</i> • Black and white art: After reading the book <u>Round Trip</u> by Ann Jonas, provide black and white paper for children to use to create a picture. They can cut or rip the paper and use glue to assemble the art. Use vocabulary words such as straight and wavy to describe the lines that they make.
 <i>PK.CKW.2 (The Arts): Responds and react to visual arts created by themselves and others.</i> | <ul style="list-style-type: none"> • Flashlight parts: Provide flashlights for children to disassemble and explore the parts. Help them ponder how the flashlight works as well as what each piece is for and how the pieces fit together.
 <i>PK.AL.4 Exhibits curiosity, interest, and willingness in learning new things and having new experiences.</i> • 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.
 <i>PK.CKW.5 (Science): Observes and describes characteristics of living things.</i> • 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 discuss how the light goes through or is blocked by the container.
 <i>PK.AL.3 Approaches tasks, activities and problems with creativity, imagination and/or willingness to try new experiences or activities.</i> • 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 in various lines such as straight, curvy and zigzag; invite them to place the lines on the paper. Encourage children 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 shapes from the paper and examine the paper together. What do the children notice? How did that happen?
 <i>PK.CKW.4 (Science): Observes and describes characteristics of earth and space.</i> • 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 <i>prism</i> to the children and use it often throughout the exploration.
 <i>PK.CKW.1 (Science): Asks questions and makes predictions based on observations and manipulation of things and events in the environment.</i> |
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- 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.CKW.1 (The Arts): Expresses oneself and represents what s/he knows, thinks, believes and feels through visual arts.
- Suggested Text: Draw Me a Star by Eric Carle. Invite children to draw their own versions of the stars and other objects the artist draws.

- Reflections: Introduce the word *reflection* to the children and use this word throughout the exploration. Invite children to look at their reflection 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.AL.3 Approaches tasks, activities and problems with creativity, imagination and/or willingness to try new experiences or activities.
- 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.CKW.6 (Science): Acquires knowledge about the physical properties of the world.
- Light table: Cut shapes from translucent file folders or page dividers of various colors; invite children to explore the shapes (starting with circle, square and triangle) as well as color mixing.
PK.CKW.2 (Geometry): Correctly name 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?

- Suggested Text: Light: Shadows Mirrors and Rainbows by Natalie M. Rosinsky. Invite children to refer to this book as they explore prisms and reflective items.

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? Tell me about... How do you know? If I want to ____, what should I do? Tell me why.
- 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 and confidently engages in play as a means of exploration and learning

Sand and Water/Sensory

- Critical thinking questions/statements: What happens when...? How do you think that works? How could you change that? What does that remind you of? What would happen if...? Tell me more...
- Mirrors: Place mirrors in the bottom of the sensory table and add water and various items. Invite children to observe and explore.
PK.CKW.6 (Science): Acquires knowledge about the physical properties of the world.

<ul style="list-style-type: none"> • 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. <i>PK.PDH.1 Uses senses to assist and guide learning.</i> • Find a match: create silhouettes of small manipulatives. Invite children to find the manipulatives that match each silhouette. Encourage children to find all of the matches. <i>PK.AL.5 Demonstrates persistence.</i> • Shadow building: Invite children to build with small blocks and connecting manipulatives. Shine a light behind the structures and observe and discuss the shadows created. Consider casting the shadows on pieces of paper and inviting children to trace them. <i>PK.PDH.5 Demonstrates eye-hand coordination and dexterity needed to manipulate objects.</i> <p>✓ Opportunity for Assessment How does the child manipulate small objects? Is s/he able to manipulate them with ease?</p> <ul style="list-style-type: none"> • Patterning: Supply translucent plastic drinking cups in a variety of colors. Invite children to create patterns with the cups. This can be done on a light table if available. <i>PK.CKW.2 (Mathematics): Duplicate and extend (e.g., what comes next?) simple patterns using concrete objects.</i> • 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 be used to secure the shapes at the angles. <i>PK.CKW.2 (Geometry): Create and build shapes from components (e.g., sticks and clay balls).</i> • Suggested Text: Papa Please Get the Moon for Me by Eric Carle. Invite children to use small blocks and connecting manipulatives to create ladders that Papa could use to get the moon. 	<ul style="list-style-type: none"> • Foil: Line the bottom 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. <i>PK.AL.4 Exhibits curiosity, and willingness in learning new things and having new experiences.</i> • Traffic light soup: Add red, yellow and green plastic circles to water in the sensory table as well as containers and scoops for scooping and sorting. Talk with the children about traffic lights and how they help keep us safe. Encourage children to think about other lights that are helpful. <i>PK.PDH.9 Demonstrates awareness and understanding of safety rules.</i> • 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. <i>PK.AL.1 Actively and confidently engages in play as a means of exploration and learning.</i> • Light table: Place a lamp or light source under the sensory table to turn the sensory table into a light table. <i>PK.CKW.1 (Technology): Describes types of materials and how they're used.</i> <p>✓ Opportunity for Assessment What can the child share about how the lamp works and the effect it has on the sensory table?</p> <ul style="list-style-type: none"> • 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. Children can pretend the glow sticks are animals from the book.
<p>Library</p>	<p>Cooking and Mixing (as needed)</p>

- Critical thinking questions/statements: Tell me about that book. What do you like about it? What do you notice? What do you think is happening? What will happen next? What would happen if...? What does the author want us to know? Does that remind you of anything?
- Storytelling: 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 could also use the props to expand on the story or create alternate endings.
PK.CLL.2 (Reading Standards for Literature): With prompting and support, retell familiar stories.
- 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.CKW.5 (The Arts): Participates in a variety of dramatic play activities to represent fantasy and real life experiences.
- Author study: Place several of Frank Asch’s light related books (e.g., Moonbear’s Shadow, Mooncake, Moonbear’s Sunrise, Moonbear’s Skyfire, Moondance, Moongame, Happy Birthday, Moon) in a basket in the library. Tell children the same person wrote the words and created the pictures for all of these books; they all have the same author and illustrator. Invite children to read the books. What things are similar? What things are different? Which book do they like best? Why?
PK.CLL.9 (Reading Standards for Literature): With prompting and support, students will compare and contrast two stories relating to the same topic.
- My Shadow: Write out the poem, *My Shadow*, by Robert Louis Stevenson. Post it in the library, read it to the children and refer to it throughout the unit.
PK.CLL.5 (Reaching Standards for Literature): Students interact with a variety of common types of texts (e.g. storybooks, poems, songs).
- Light box: Humpty Dumpty color mixing: Create Humpty Dumpty’s of various colors by cutting out ovals from translucent file folders of

- Critical thinking questions/statements: Why do you think we are adding...? What would happen if...? What do you notice as we do this? How do you think it will taste? How does it smell? How does it feel? What does it look like? What does this remind you of?
- Starry Night playdough pictures: Make blue and yellow playdough with the children. After the playdough is made, provide pictures of Van Gogh’s *Starry Night* painting for the children to view, then ask the children to use the yellow and blue playdough to create their own representations of the art.
PK.CKW.2 (The Arts): Responds and reacts to visual arts created by themselves and others.
- 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.CLL.1 (Reading Standards: Foundational Skills): 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.

Notes:

- 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.
- 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 USDA meal guidelines in order to make sure children’s nutritional needs are met.

<p>various colors. Use a permanent marker to add a face. Supply a written copy of the Humpty Dumpty rhyme or nursery rhyme book and read it to the children. Invite them to retell the rhyme and/or explore color mixing by layering various Humpty Dumpty.</p> <p><i>PK.CLL.5 (Reading Standards for Literature): Students interact with a variety of common types of texts (e.g., storybooks, poems, songs).</i></p>	
<p>Computer/Technology</p> <p><i>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 outlined in their Individualized Education Program.</i></p> <ul style="list-style-type: none"> • Drawing with light: If a camera with video option is available, 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. <i>PK.CKW.3 (Technology): Expresses an understanding of how technology affects them in daily life and how it can be used to solve problems.</i> • Lite Brite: If available, allow children to explore a Lite Brite. Children can play with it in the way it was designed and/or explore the components and how it works. <i>PK.CKW.3 (Technology): Expresses an understanding of how technology affects them in daily life and how it can be used to solve problems.</i> • Fireworks: Look up pictures of fireworks on the computer and use as inspiration for painting. Invite children to help you search for the pictures and determine which ones to print. <i>PK.CKW.4 (Technology): Understands the operation of technology systems.</i> <p>√ Opportunity for Assessment</p> <p>What does the child understand about the input and output devices on the computer such as the keyboard, monitor and mouse?</p> <ul style="list-style-type: none"> • Sun, moon and stars: Look up satellite pictures of the sun, moon and various stars. Show children how to find a few letters on the keyboard as you use them. 	<p>Outdoors/Playground</p> <ul style="list-style-type: none"> • Critical thinking questions/statements: I saw you do... What will you do next? If you try... What do you notice? How did you do..? Ring toss: If glow sticks are available, fasten them into rings and invite children to toss them into a large bowl. <i>PK.PDH.4 Combines a sequence of large motor skills with and without the use of equipment.</i> • Jack be nimble: Supply a small block or other similar item to represent a candle stick. Invite children to take turns jumping over the item. As the children jump, say the rhyme, <i>Jack be nimble, Jack be quick, Jack jump over the candlestick</i>. Replace the name <i>Jack</i> with a child’s name to indicate his/her turn. <i>PK.PDH.3 Demonstrates coordination and control of large muscles.</i> • Red light, green light: <i>Play Red Light, Green Light</i>, outdoors or on the playground with the children. Refer to Unit 5: Transportation for implementation directions. <i>PK.CLL.5 (Language Standards): With guidance and support, explore word relationships and nuances in word meanings.</i> • 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. <i>PK.CKW.4 (Science): Observes and describes characteristics of earth and space.</i>

<p><i>PK.CKW.4 (Science): Observes and describes characteristics of earth and space.</i></p>	<ul style="list-style-type: none"> Light table: Allow children to collect natural items from outside and explore on the light table. <i>PK.CKW.6 (Science): Acquires knowledge about the physical properties of the world.</i> Suggested Text: <u>What Makes a Shadow?</u> by Clyde Bulla. Invite children to look for and explore the shadows they see outside or in the Gross Motor Area.
<p>Writing</p> <ul style="list-style-type: none"> Critical thinking questions/statements: I notice that you... That reminds me of... What if you try..? What's under the table? Write this question on a piece of paper and place the paper on top of the table. Model reading the sign 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 the flashlight 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 but continue to allow children to look under the table to find the answer. <i>PK.CLL.1 (Reading Standards: Foundational Skills): Demonstrate understanding of the organization and basic features of print.</i> 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. <i>PK.CLL.1 (Reading Standards: Foundational Skills): Demonstrate understanding of the organization and basic features of print.</i> 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. <i>PK.CLL.1 (Language Standards): Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.</i> 	<p>Music and Movement</p> <ul style="list-style-type: none"> Critical thinking questions/statements: I see you moving like this. I heard you... 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? 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. <i>PK.PDH.3 Demonstrates coordination and control of large muscles.</i> 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 your own disco ball glue squares of tin foil to a ball or balloon. <i>PK.CKW.7 (The Arts): Expresses what s/he knows, thinks, feels and believes through dance and creative movement.</i> 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. <i>PK.CKW.7 (The Arts): Expresses what s/he knows, thinks, feels and believes through dance and creative movement.</i> √ Opportunity for Assessment

<ul style="list-style-type: none"> • 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. <i>PK.CLL.5 (Approaches to Communication): Demonstrates a growing receptive vocabulary.</i> • Large letters: Allow children to place small plastic letters and numbers onto an overhead projector (if available). Project the letters and numbers 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. <i>PK.CLL.1 (Reading Standards: Foundational Skills): Demonstrate understanding of the organization and basic features of print.</i> √ Opportunity for Assessment What letters can the child recognize and/or name? • 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. <i>PK.CLL.1 (Language Standards): Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.</i> • Suggested Text: <u>The Game of Light</u> by Hervé Tullet: Invite children to look at the types of lines in the book. 	<p>How does the child use his/her body while dancing? What creative movements (sway, stomp, twist, etc.) does s/he use?</p> <ul style="list-style-type: none"> • Light table: Create a water xylophone. Fill small glass jars with various amounts of colored water. Invite children to gently tap the sides of the jar with a spoon and listen to the different tones produced. <i>PK.CKW.3 (The Arts): Expresses oneself by engaging in musical activities.</i> • Suggested Text: <u>Goodnight Songs</u> by Margaret Wise Brown. Read a selection of these poems before rest time. Leave this book in the Music and Movement Center and invite children to read it while listening to quiet music during Center Time.
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V. 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; these are foundational texts. Some books will be read only once or twice throughout the unit; these are supporting texts. Supporting texts complement 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. Choose a balance between informational texts and literature to help children understand the scientific content of this unit and help them connect to this increasingly abstract concept. 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.*

The Big Dipper (Let's-Read-and-Find-Out Science 1) by Franklyn M. Branley: Are the stars out tonight? If they are, chances are you will see the Big Dipper.

**Blackout* by John Rocco: When the power goes out in New York City on a summer night a family goes up to their roof and enjoys the stars.

Bunny Rabbit in the Sunlight by Chris Ballew: An assortment of animals; each shown in a unique form of light.

Day Light, Night Light: Where Light Comes From (Let's-Read-and-Find-Out Science 2) by Franklyn M. Branley: Moonlight is really sunlight!

Draw Me a Star by Eric Carle: Draw me a star. And the artist drew a star. It was a good star. Draw me a sun, said the star. And the artist drew a sun. And on the artist draws...

Faces of the Moon by Bob Crelin: Why does the moon seem to change shape from night to night?

Fireflies in the Night by Judy Hawes: A young girl learns some interesting facts about fireflies from her grandfather.

Flashlight by Lizi Boyd: Inside a tent it's cozy. But what is going on outside? Is it dark? Is it scary? Not if you have your trusty flashlight!

The Game in the Dark by Hervé Tullet: A storytelling game that asks children to hold the book under a light source, turn the light off and then take a journey on a rocket to the moon in the dark.

The Game of Light by Hervé Tullet: Inside this book are beautiful paintings, ready for you to mix up. Turn the flaps to create a whole new work of art - with squiggles, spots, squares and shapes of all kinds!

The Game of Shadows Hervé Tullet: There's a noise in the garden. Who could it be? Creatures hidden in the bushes? Let's go and see!

**Goodnight Moon* by Margaret Wise Brown: Goodnight room, goodnight moon and goodnight to all the familiar things in the softly lit room.

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.

Goodnight Songs by Margaret Wise Brown: A collection of charming lullabies illustrated by 12 award-winning artists.

Guess Whose Shadow? by Stephen R. Swinburne: The basics of shadows and a shadow hunt.

The House in the Night by Susan Marie Swanson: Nighttime things that are comforting and intriguing.

How a Seed Grows by Helene Jordan: How does a tiny acorn grow into a huge tree?

How Do We Use Light? by Daniel Nunn: An introduction to the concept of light for young readers.

How Many Stars in the Sky by Lenny Holt: An all-night journey of discovery.

How the Sun got to Coco's House: While Coco sleeps far away, the sun creeps over a hill.

How to Catch a Star by Oliver Jeffers: Once there was a boy, and that boy loved stars very much. So much so that he decided to catch one of his very own. But how?

If You Decide to go to the Moon by Faith McNulty: If you decide to go to the moon, read this book first. It will tell you how to get there and what to do after you land. The most important part tells you how to get home.

*I took the Moon for a Walk by Carolyn Curtis: When the day has ended and everyone else has fallen asleep, a young boy embarks on a magical adventure with his friend the Moon.

*Kitten's First Full Moon by Kevin Henkes: It is Kitten's first full moon, and when she sees it, she thinks it is a bowl of milk in the sky. And she wants it. Does she get it?

Light and Dark by Daniel Nunn: An introduction to the concepts of light and dark.

Light Is All Around Us (Let's-Read-and-Find-Out Science 2) by Wendy Pfeffer: Light is all around us and it comes in many forms.

Little Owl's Day by Divya Srinivasan: Little Owl is supposed to be asleep, but when he wakes up early, he's just too curious to close his eyes again.

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

The Moon Book by Gail Gibbons: Identifies the moon as our only natural satellite, describes its movement and phases, and discusses how we have observed and explored it over the years.

The Moon Seems to Change by Franklyn Mansfield Branley: Can you see the moon? Does it look like a big round ball? Or is it just a sliver of light in the sky? The moon seems to change. But it doesn't really.

The Night World by Mordicai Gerstein: The secrets of nighttime and the beauty of dawn.

Nothing Sticks Like a Shadow by Ann Tompert: To win a bet, Rabbit tries to get rid of his shadow with the aid of his many animal friends.

Peppe the Lamplighter by Elisa Baritone: Peppe becomes a lamplighter to help his immigrant family in turn-of-the-century New York City.

*Papa Please Get the Moon for Me by Eric Carle: Monica wants the moon to play with, so her Papa sets out to get it for her.

A Rainbow of my Own by Don Freeman: A small boy imagines what it would be like to have his own rainbow to play with.

Shadow by Suzy Lee: An adventure that begins and ends with the click of a light bulb.

Shadows and Reflections by Tana Hoban: Shadows and reflections are all around us- under our feet, over our heads, directly in front of us.

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

Stars by Mary Lyn Ray: An exploration of stars both near and far.

Sun and Moon by Lindsey Yankey: All moon wants is to spend one day as the sun.

The Very Lonely Firefly by Eric Carle: A very lonely firefly finally finds the friends he is seeking at the end of a tireless search for belonging.

VI. Sample Weekly Plan

UNIT TITLE: Light					
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: battery, candle, curve, dark, electricity, fire, flame, flashlight, horizontal, lamp, lantern, light, light bulb, lines, moon, parallel, rainbow, spiral, stars, straight, sun, traffic light, vertical, zigzag					
	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 three, “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 in this manner, consider encouraging them to write their names throughout their center time play. For example, children could add their own names to their artwork or create their own name cards to save their structures in the Block/Construction Center. <i>PK.CLL.1 (Language Standards): Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.</i>				
Large Group Meeting (In order to reduce the amount of time children	<i>Foundation Text Read Aloud</i> Read the Foundational Text <u>Round Trip</u> by Ann	<i>Lights All Around Us</i> Revisit the Foundational Text	<i>Mister Sun</i> Teach the children the song <i>Mister Sun</i> (see	<i>Please Shine Down on Me</i>	<i>Light, Sight, Fright</i> Write the word <i>light</i> large enough for the

<p>spend in large group and ensure that children have enough time to engage in meaningful play, teachers should think strategically about other whole group activities and whether they are essential to the day.)</p>	<p>Jonas aloud to the class, paying special attention to the types of light the people in the story see on their trip.</p> <p><i>PK.CLL.1 (Reading Standards for Literature): With prompting and support, ask and answer about details in a text.</i></p> <p>See page 36 for lesson plan and Section IX for Inquiry and Critical Thinking Questions.</p>	<p><u>Round Trip</u> by Ann Jonas. Rather than reading the text, 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><i>PK.CLL.10 (Reading Standards for Literature): Actively engage in group reading activities with purpose and understanding.</i></p>	<p>Section VIII: 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><i>PK.CKW.5 (The Arts): Expresses oneself by engaging in musical activities.</i></p>	<p>Review the song <i>Mister Sun</i> 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 <i>Mr.</i> or <i>Ms.</i> (e.g., Ms. Lamp, Mr. Flashlight).</p> <p><i>PK.CKW.5 (The Arts): Expresses oneself by engaging in musical activities.</i></p>	<p>children to see it. Ask the children what would happen in you changed the first letter of the word. Play with this idea by covering the <i>L</i> with other letters. Read the new words with the children (e.g., Light → Sight), calling attention to how the initial letter looks as well as the sound it makes.</p> <p><i>PK.CLL.2 (Reading Standards: Foundational Skills): Demonstrate an emerging understanding of spoken words, syllables and sounds (phonemes).</i></p>
<p>Foundational Text</p>	<p><u>Round Trip</u> by Ann Jonas</p>				

Supporting Text	<u>Bunny Rabbit in the Sunlight</u> by Chris Ballew	<u>Flashlight</u> by Lizi Boyd	<u>Light Is All Around Us (Let's-Read-and-Find-Out Science 2)</u> by Wendy Pfeffer	<u>Sun and Moon</u> by Lindsey Yankey	<u>Day Light, Night Light: Where Light Comes From</u> (Let's-Read-and-Find-Out Science 2) by Franklyn M. Branley
<p>Small Groups</p> <p>Implement at least two of the three small group activities per week.</p> <p>*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 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</p>	<p>LITERACY SMALL GROUP</p> <p><i>The Shapes of Your Letters.</i></p> <p>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 the characteristics of the lines using vocabulary words such as <i>straight</i> and <i>curve</i>. Ask the children which letters include these types of lines. After children explore the lines, help them compare the lines in their names to the lines on the table. Provide name cards for them to reference. Children who are already familiar with many types of lines can look for, and identify,</p>	<p>MATH SMALL GROUP:</p> <p><i>Shine Your Light</i></p> <p>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 the paper with the corresponding shape.</p> <p><i>PK.CKW.2 (Geometry): Correctly name shapes regardless of size.</i></p> <p>Group 1:</p> <p>Group 2:</p>	<p>SMALL GROUP #3:</p> <p><i>What Melts in the Sun?</i></p> <p>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 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</p>	<p>Catch up day: Use this as an opportunity to complete small groups with children you may have missed throughout the week.</p> <p>Children to work with today (initials):</p>	<p>Catch up day: Use this as an opportunity to complete small groups with children you may have missed throughout the week.</p> <p>Children to work with today (initials):</p>

<p>of groups per day and spend the remainder of the time engaging with children in the interest areas.</p>	<p>lines throughout the classroom.</p> <p>*To implement this activity without a light table, children could use tracing paper, paper protectors or transparent file folders to trace the lines.</p> <p><i>PK.CLL.1 Demonstrate understanding of the organization and basic features of print.</i></p> <p>Group 1:</p> <p>Group 2:</p> <p>Group 3:</p> <p>Group 4:</p> <p>Group 5:</p>	<p>Group 3:</p> <p>Group 4:</p> <p>Group 5:</p>	<p>the day. Place a chart with two columns, one titled <i>Yes</i> and one titled <i>No</i>, near the muffin tin. When children check the experiment they can write their name or a make a mark in the appropriate column. Share results with the children at the end of the day. Some suggestions for items to try: butter, chocolate, crayons and ice.</p> <p><i>PK.CKW.4 (Science): Observes and describes characteristics of earth and space.</i></p> <p>Group 1:</p> <p>Group 2:</p> <p>Group 3:</p> <p>Group 4:</p> <p>Group 5:</p>		
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Small Group Tips	<p><i>4 Quick Tips for Small Group:</i></p> <ul style="list-style-type: none"> • <i>Use exciting language and affect to describe the small group activity.</i> • <i>Use hands-on materials that children are encouraged to explore.</i> • <i>Preview small group activities in whole group.</i> • <i>Link the activity to children’s previous experiences.</i> <p><i>If children still decline...</i></p> <ul style="list-style-type: none"> • <i>Have a private conversation with the child as s/he plays to understand why s/he did not want to join. Take that into consideration and adjust the small group materials to reflect the needs of the child.</i> • <i>Modify the small group activity so that you can do it with the materials that the child is using in the center of his or her choice.</i> • <i>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.</i>
Outdoors	See Section IV, Ideas for Learning Centers.
Lunch	Translucent or opaque? Discuss the food the children are eating. Are the foods translucent or opaque?
Centers	See Section IV, Ideas for Learning Centers.
Opportunities for differentiation and integration of goals for children with IEPs	(To be completed as needed by teachers.)
Differentiation for children whose home language is a language other than English	(To be completed as needed by teachers.)

VII. Sample Student Work

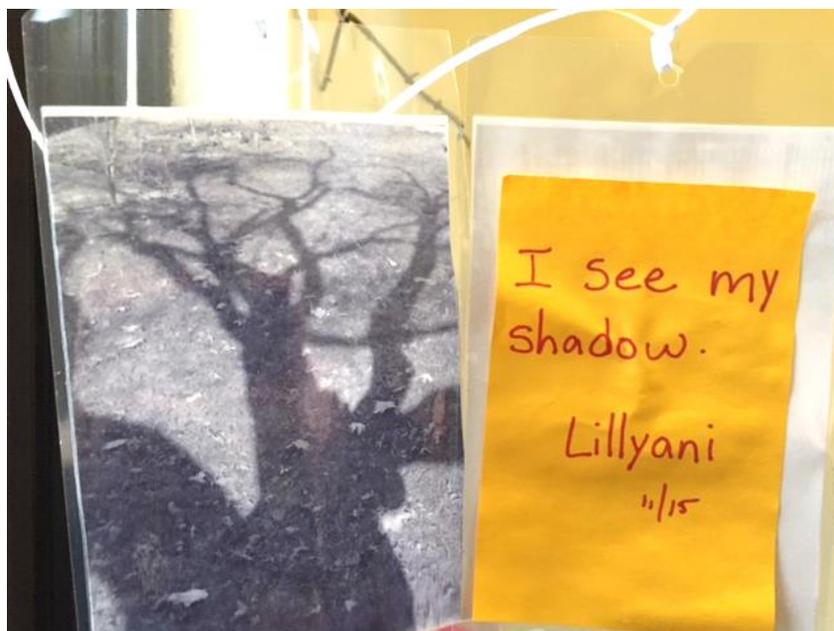
Below are examples of student work that were produced throughout this unit. Note the alignment to standards and relationship to the overarching question, enduring understandings, and unit subtopics. Some examples may fit under more than one standard, essential understanding, and/or focus question.

Example 1: My Shadow Does That Too!

Activity Type: Foundational Learning Experience

Focus Question: What are shadows?

PKFCC Standard: *PK.CKW.4 (Science) Observes and describes characteristics of earth and space.*



Example 2: Sun stains

Activity Type: Centers (Science)

Focus Question: What kinds of light are around us?

PKFCC Standard: *PK.CKW.4 (Science) Observes and describes characteristics of earth and space.*



“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.”
Hugh



“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.”
Gouzhi

VIII. 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

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

National Science Teachers Association- Early learning experiences build toward understanding concepts that are hard to teach

<http://nstacomunities.org/blog/2012/09/27/early-learning-experiences-build-toward-understanding-concepts-that-are-hard-to-teach/>

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

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.

Song Titles
May There Always be Sunshine
Moon, Moon, Moon

You Are My Sunshine
 Hey Diddle Diddle

Songs with Lyrics

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

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!

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.

IX: 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 (<http://schools.nyc.gov/NR/rdonlyres/522E69CC-02E3-4871-BC48-BB575AA49E27/0/WebbsDOK.pdf>) which provides a vocabulary and critical thinking frame of reference when thinking about our children and how they engage with unit content. A **PKFCC** standard is also listed for each text. This standard addresses several of the questions provided for each book. Reread foundational texts throughout the unit, starting with Level 1 questions and adding more complex questions each time you read them.

Round Trip by Ann Jonas

PK.CLL.1 (Reading Standards for Literature): With prompting and support, ask and answer about details in a text.

Level 1: Recall

- Where were the people going on the trip?
- How did the people in this story get to the city?
- Have you ever gone on a trip? Where did you go? How did you get there?

Level 2: Skill/Concept

- The trip started as soon as it was light. What does that mean? What time of the day did the trip start?
- Why was the neighborhood quiet, the houses dark and the stores closed when the trip started?
- Why do we turn on lights when it is dark?

Level 3: Strategic Thinking

- When the people got to the city they saw a lot of lights. Why?
- The people in this book rode in a car and on the subway. Do cars and subways have lights? Why?

Level 4: Extended Thinking

- What do you notice about the pictures in this book? Why do you think the illustrator only used black and white?
- What color does the illustrator use to show light? What color does the illustrator use to show darkness? Why?

All About Light by Lisa Trumbauer

PK.CLL.1 (Reading Standards for Informational Text): With prompting and support, ask and answer questions about details in a text.

Level 1: Recall

- What are some things that give off light?

- What happens when the sun goes down?
- Why does the moon look bright?

Level 2: Skill/Concept

- Shadows form when light is blocked. Do you see any shadows around you now?
- What kinds of light do you see in our classroom?

Level 3: Strategic Thinking

- When the sun is up it is light outside. What are some things people do in the light?
- When the sun goes down it is dark outside. What are some things people do in the dark?
- Why do we need lights in pre-K?
- Why do we need lights at home?

Level 4: Extended Thinking

- Do you prefer light or darkness? Why?
- Why do you think cars, buses and trains have light?

Can't You Sleep Little Bear? by Martin Waddell

PK.CKW.4 (Science): Observes and describes characteristics of earth and space.

Level 1: Recall

- Where does Little Bear sleep?
- Why couldn't Little Bear sleep?
- What did Big Bear do to help Little Bear sleep?

Level 2: Skill/Concept

- What did Big Bear and Little Bear use to light their cave? What do you use to light the place you live?
- Why did Big Bear and Little Bear go home when it got dark outside?

Level 3: Strategic Thinking

- Big Bear and Little Bear played outside in the bright sunlight. What do you like to do when it is sunny outside?
- Why do you think Big Bear wanted Little Bear to go to sleep?

Level 4: Extended thinking

- Why do you think Little Bear does not like the dark?

- Big Bear takes Little Bear outside to see the moon and Little Bear falls asleep. What are some other things you could do to help someone who is scared of the dark fall asleep?

Moonbear's Shadow by Frank Asch

PK.CKW.4 (Science): Observes and describes characteristics of earth and space.

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?
- What kind of fish did Bear's shadow catch?

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 get rid of/see your shadow?

X: Lesson Plans: Foundational Learning Experiences

Lesson Title: Round Trip by Ann Jonas

Lesson Type: Read Aloud

Unit of Study: Light		Unit Focus Question: What kinds of lights are around us?
Objective: Children will answer questions about the text.		
<p>PKFCC Focus Standard: <i>PK.CLL.1 (Reading Standards for Literature): With prompting and support, ask and answer about details in a text.</i></p> <p>Additional PKFCC Standards: <i>PK.CLL.1 (Reading Standards for Literature): With prompting and support, make connections between self, text and the world around them (text, media, social interaction).</i></p>		<p>Link to Authentic Assessment Systems WSS: II.C.4. Recounts some key ideas and details. TSG: 18a. Interacts during read alouds and book conversations COR: M. Listening and comprehension</p>
<p>Materials:</p> <ul style="list-style-type: none"> • <u>Round Trip</u> by Ann Jonas 		<p>Connected Academic Vocabulary: light, lightning, dark, sun</p>
<p>Procedure: Hook: Show children the cover of the book. Beginning: Share the title of the book. Share the author’s name as well as the illustrator’s name. Ask the children what they think this book is about. Middle: Read the book to the children. Pause throughout the book to ask the questions suggested in Section IX. End: Halfway through the book the reader must turn the book around to continue reading. After reading this book aloud, ask children to think about this book and the way you held the book while you read. What did they notice? Why do they think the author/illustrator decided to make a book like this? Summarize the discussion.</p>		
Assessment: What questions is the child able to answer about the text?		
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: Read a few pages in the story rather than reading the entire book. Invite these children to sit next to a teacher.
For children who are ready for a challenge: 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.

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

Children whose home language is a language other than English: 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.

Teacher Tip:

- This book will be used a second time this week to explore different sources of light in the environment.

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?

**Foundational Learning
 Experience Assessment
 Opportunity**

Read Aloud Experience: Round Trip by
 Ann Jonas

PKFCC Focus Standard: *PK.CLL.1 (Reading Standards for Literature): With prompting and support, ask and answer about details in a text.*

Authentic Assessment Alignment:

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

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

Lesson Title: The Starry Night

Lesson Type: Whole Group

Unit of Study: Light		Unit Focus Question: What is darkness?	
Objective: Children will reflect on a piece of visual art.			
PKFCC Focus Standard: <i>PK.CKW.2 (The Arts): Responds and react to visual arts created by themselves and others.</i>		Link to Authentic Assessment Systems WSS: VI.B.1 Responds to artistic creations or events. TSG: 33. Explores the visual arts COR: X. Art	
Additional PKFCC Standards: <i>PK.CLL.3 (Approaches to Communication): Demonstrates that s/he understands what they observe.</i>			
Materials: <ul style="list-style-type: none"> Print or copy of Van Gogh's <i>The Starry Night</i> 		Connected Academic Vocabulary: dark, light, moon, night, stars	
Procedure: Hook: Hang the print at the children's eye level in a highly visible place in the classroom. Invite children to take a 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. Beginning: 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 <i>The Starry Night</i> and an artist named Vincent Van Gogh painted it. Middle: Ask children to take some time to look at this painting again. Ask children some of the following questions: What do you notice about the painting? How does the painting make you feel? What do you see in the picture? What colors do you see? What might these colors mean? What does the title of the painting tell us? Chart children's responses. End: Summarize the discussion about the painting and children's responses.			
Assessment: What does the child share that indicates s/he is able to reflect on the artwork?			
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. Ask them to compare and contrast.

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

Children whose home language is a language other than English: What language is needed to understand the lesson, activity instructions, and participate in of the activity and discussion?

Point to the different elements of the painting as you talk about them. For example, when children talk about what they see in the painting point to each object they talk about.

Teacher Tip:

Calling children’s attention to the art before the group activity and discussing it briefly with them will provide children some time to think about the painting and 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?

**Foundational Learning
 Experience Assessment
 Opportunity
 Whole Group Experience: The Starry
 Night**

PKFCC Focus Standard: *PK.CKW.2 (The Arts): Responds and react to visual arts created by themselves and others.*

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

Lesson Title: Light Helps Plants Grow

Lesson Type: Small Group

Unit of Study: Light		Unit Focus Question: How does light help us?	
Objective: Children will understand that lights help plants grow.			
PKFCC Focus Standard: <i>PK.CKW.4 (Science): Observes and describes characteristics of earth and space.</i>		Link to Authentic Assessment Systems 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	
Additional PKFCC Standards: <i>PK.CKW.5 (Science): Observes and describes characteristics of living things.</i>			
Materials: <ul style="list-style-type: none"> • Seeds • Small container for planting • Soil • Light and dark areas for storing planted seeds • Chart paper • Marker 		Connected Academic Vocabulary: dark, grow, heat, light	
Procedure: Hook: Show children a plant, ideally a live plant but if necessary a picture of a plant. Beginning: Tell the children the plant is alive and that plants grow. Ask children what they think plants need in order to grow. Guide the discussion making sure to note that plants need light to grow. Middle: Tell children they are going to plant a seed. Discuss how to plant a seed. Allow children to plant their seeds assisting 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. End:			

Store the children’s plants in the designated areas for a period of time.
 Invite children to monitor the plants periodically and water them.
 At the conclusion of the experiment, graph the results. Create a graph with two columns *light* and *dark* and tally how many plants grew in the dark place and how many plants grew in the light place.

Assessment:
 Does the child understand that plants need light to grow? What evidence is there to support this understanding?

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: Take pictures of the plants a few times throughout the experiment. Create a chart or book to solidify the learning.
For children who are ready for a challenge: Increase the complexity of the experiment by choosing some plants in the light section and some plants in the dark section to water more, and some less. Keep track of which plants you will water more and less and record the results of the effects on the plants’ growth.

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

Children whose home language is a language other than English: What language is needed to understand the lesson and activity instructions and to participate in the activity and discussion?
 Prior to this activity, read a book with clear illustrations or photographs about what plants need in order to grow.

Teacher Tip:

- 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.
- The plants will also need to be watered.
- Check labels on soil mixtures to ensure the soil is safe for children.
- Be sure children wash their hands after handling soil and planting seeds.

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?

**Foundational Learning
 Experience Assessment
 Opportunity**
Small Group Experience: Light Helps Plants
 Grow

PKFCC Focus Standard: *PK.CKW.4 (Science): Observes and describes characteristics of earth and space.*

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	Understands that plants need light	Evidence of understanding	Notes

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Lesson Title: My Shadow Does That Too!

Lesson Type: Outdoors

Unit of Study: Light		Unit Focus Question: What are shadows?	
Objective: Children will begin to understand that shadows are created when light is blocked.			
PKFCC Focus Standard: <i>PK.CKW.4 (Science): Observes and describes characteristics of earth and space.</i>		Link to Authentic Assessment Systems 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	
Additional PKFCC Standards: <i>PK.CKW.1 (Science): Asks questions and makes predictions based on observations and manipulation of things and events in the environment.</i>			
Materials: <ul style="list-style-type: none"> • Space for children to see their shadows • Camera (if available) • Paper • Writing Utensil 		Connected Academic Vocabulary: opaque, light, dark, shadow, sun	
Procedure: Hook: Dance or move excitedly and invite children to look at your shadow. Beginning: Invite children to dance or move with you. Point out to the children how their shadow moves in the same way they do. Middle: Ask children to stop moving and pose for a shadow picture. Take a picture of each child’s shadow. End: Ask children to tell you about their shadow and how shadows are made. Record student’s responses. Display the pictures of children’s shadows with their dictations in the classroom.			
Assessment: What does the child understand about how shadows are made?			

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: Ask questions to prompt a response and extend thinking. However, children will be at different points in their understanding and ability to articulate their thoughts. Your dictation should record exactly what the child says.

For children who are ready for a challenge: Ask them to use their bodies to try make lines and/or shapes related to the unit vocabulary (straight, zigzag, etc.).

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

Children whose home language is a language other than English: What language is needed to understand the lesson, activity instructions, and participate in the activity and discussion?

If possible, invite a staff or family member who speaks (and writes) the child’s home language to participate in this activity. Ask this person to take the child’s dictation about his/her shadow in the home language. Display the child’s dictation in both the home language as well as English.

Teacher Tip:

- If a camera is not available, trace each child’s shadow on a large piece of butcher paper.
- Prior to implementing this activity select a location and time of day that is conducive to creating and viewing shadows.

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?

**Foundational Learning
 Experience Assessment
 Opportunity**

Outdoor Experience: My Shadow Does That Too!

PKFCC Focus Standard:

PK.CKW.4 (Science): Observes and describes characteristics of earth and space.

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	Knowledge about shadows	Understands how the sun can create 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:

- XII.** 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 drawer

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 can 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 really big for them to see. Imagine not being able to see a toy from far away—only being able to see it when it's 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. Loss of sight is different for different people. People who experience loss of vision may walk using white canes, or people or dogs to guide them. They can also read using Braille which is an alphabet of raised dots that can be read with the fingers.

Appendix C: Finger Shadow Puppets



Butterfly



Dog



Teddy Bear



Pig

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

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.

