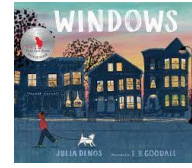


Unit 4: Light and Darkness



WEEK 1

**Science and Engineering: Light Play 1: Opaque Materials**

Children play with light. This week, children investigate how light interacts with opaque materials.

Note: This is a three-part learning experience that continues through Week 3.

<b>Big Ideas</b>	Light comes from natural and artificial sources. People use their senses to see and feel light. Shadows are created when an object blocks light.
<b>Guiding Question</b>	How is natural light different from artificial light?
<b>Family Engagement</b>	Encourage families and caregivers to talk about and explore light at home, with house lights, lamps, flashlights, etc. Suggest that children experiment with various objects at home to block the light.
<b>Vocabulary</b>	<b>block:</b> to get in the way and stop something from coming through, such as light <b>light source:</b> something that shines light, like the sun, or a lamp <b>opaque:</b> not letting any light through, blocking all light <b>surface:</b> the top layer
<b>Materials and Preparation</b>	<ul style="list-style-type: none"><li>● <i>Windows</i>, Julia Denos Flag pages 3-4.</li><li>● light table</li><li>● various small, opaque materials from around the classroom (e.g., dark construction paper squares, paintbrushes, bear counters, small blocks, board book, etc.) Store the materials in a basket on the side of the light table.</li><li>● paper attached to clipboards</li><li>● writing and drawing tools</li></ul> <p>This three-part learning experience requires a light table. If a store-purchased light table is not possible, assemble one instead. A simple</p>

	<p>light table can be created by adding a light source (e.g., string lights or battery operated tea lights) to a large, short, plastic storage bin and covering the lid with a translucent covering (e.g., tissue paper, paper towel). Another alternative is to utilize an old overhead projector.</p> <ul style="list-style-type: none"> <li>● A simple “how to” video can be found <a href="#">here</a>.</li> <li>● A website resource can be found <a href="#">here</a>.</li> </ul> <p>Bring to the Intro to Centers: <i>Windows</i>, the light table/ projector, a couple of the opaque materials.</p>
<p><b>Intro to Centers</b></p>	<p><i>In Windows, we can see light shining through the windows at night.</i>  Show <i>Windows</i>, pages 3-4. Point to the bicycle.  <i>The light shines against many different kinds of objects. This bicycle is <b>opaque</b>, which means that light is unable to pass through it.</i>  <i>What do you notice?</i>  Point to the shadow.</p> <p>Show the light table, turned off.  <i>This week in Science and Engineering we will play with light! This is a light table. There is a <b>light source</b> inside the table that shines through the plastic. Are you ready to see it turned on?</i>  Turn the light table on. Invite children’s reactions.  <i>What do you see?</i>  Collect responses from children.  <i>During Centers, we will experiment with light by putting different objects on the table. These objects are all opaque, that means that light is unable to pass through them. Let’s see what happens when I place this paintbrush on the light table. What do you notice?</i>  Invite 1-2 responses. If children need support, share that the light does not pass through the paintbrush, instead, there could be a solid shadow.</p>
<p><b>During Centers</b></p>	<p>Children experiment with the opaque materials at the light table/projector. Encourage children to search for additional items around the room that are opaque.</p> <p>Encourage children to draw pictures of the opaque objects that they have played with at the light table.</p> <p>When possible, turn down the class lights to better illuminate the light table.</p>
<p><b>Differentiation ideas</b></p>	<ul style="list-style-type: none"> <li>● Use a core board and Center Language Support to support childrens’ communication about what they can see or not see through opaque/translucent/transparent objects (e.g., “I see,” “I don’t see,” “I see a little”).</li> </ul>

	<ul style="list-style-type: none"> <li>● Create smaller, individual light tables for children to work independently.</li> <li>● Provide just a few opaque materials or high interest items for children to experiment with.</li> </ul> <p>For further modified learning experiences, see <a href="#">Science and Engineering: Light Play Differentiated Access</a></p>
<b>Facilitation</b>	<ul style="list-style-type: none"> <li>● What do you notice about the light table?</li> <li>● Which materials here are opaque? Translucent? Transparent?</li> <li>● How does the opaque/transparent/translucent material interact with the light?</li> <li>● What other materials might we try? Why?</li> </ul>
<b>Standards</b>	<p><b>PreK-PS1-2(MA).</b> Investigate natural and human-made objects to describe, compare, sort, and classify objects based on observable physical characteristics, uses, and whether something is manufactured or occurs in nature.</p>

**Image Citations from Center Language Supports:**

- light source: b13923790 on Pixabay
- opaque: <https://fineartamerica.com/featured/vintage-wooden-door-in-vienna-helenap-art.html>
- surface: Tim Mossholder from Unsplash
- translucent: <https://www.mornglass.com/how-to-make-the-glass-frosted-glass.html>
- transparent: <https://www.mornglass.com/how-to-make-the-glass-frosted-glass.html>

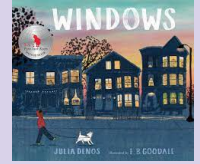
**Notes**





## U4 W1-3 Center Language Supports

# Science and Engineering: Light Play



### Facilitation prompts:

- What do you notice about the table?
- What do you notice about the light table?
- Which materials here are opaque? Translucent? Transparent?
- How does the opaque/transparent/translucent material interact with the light?
- What other materials might we try? Why?



light source



opaque



surface



translucent



transparent

### Children are learning to...

- investigate natural and human-made objects to describe, compare, sort, and classify objects based on observable physical characteristics. (PreK-PS1-2MA)