Unit Summary

	Cluster 1: Light Is All Around Us (Lessons 1-2)	Cluster 2: Light Travels in Straight Lines (Lesson 3)	Cluster 3: Light Bounces (Lessons 4-6)
Overview	Children consider questions about where light comes from, how it gets from one place to another, and how light enables us to see objects. They discover how difficult it is to create an area with no light.	Children explore and model how light beams travel. Their observations help them understand that not only does light *exist* in straight lines; it *travels* in straight lines.	Children establish that light can bounce, or be reflected. They realize that vision is possible because light bounces off objects and into their eyes; the more light there is, the easier it is to see. They also manipulate periscopes to observe a variety of objects.
Science Content	• If you can see something, then light must be present.	• Light travels in straight lines. It moves outward in all directions from a source until it hits something.	• Light bounces off many materials. • Light can bounce directly back (mirror-like reflection) or in many directions (scatter). • We see because light bounces off objects and into the eye. • The more light there is, the easier it is to see things.
Science Center	• Begin using a "dark box," which allows children to observe objects through a hole and to control how much light enters the box.	• Shine light into the dark box to target dots on a card. • Experiment with shining light through a cloudy solution.	• Bounce light off of smooth and rough materials. • Model how light travels to the eye using a cluster of straws. • Explore how objects can be seen using a dark box and a flashlight. • Continue experimenting with the periscopes. • Modify a periscope by putting it together in different ways. • Manipulate mirrors and a flashlight to direct light.
Family Links	• Introduce the *Family Link Notebooks*.		• Explore how light bounces off objects. • Explain to a family member how light bounces off of objects and into their eyes, enabling them to see. • Make periscopes at home with the help of a family member.
Further Science Explorations	• Discuss the ideas generated during a science talk. • Experiment with light inside a shoebox. • Research light pollution.	• Line up index cards to observe the path of light through holes. • Build a pinhole viewer to model how light travels in straight lines.	• Bounce light off shiny and matte surfaces. • Explore how light bounces off the moon. • Model how light travels through a periscope to the eye using a flashlight, a ball and two mirrors. • Build more elaborate periscopes using longer tubes and multiple mirrors.
Cross-Curricular Extensions	**Language Arts:** Read about scientists who contributed to our understanding and use of light. **Social Studies**: Discuss what life was like before the invention of electric lights.		**Art:** Use bouncing light to trace a picture. **Language Arts:** Read the book *Stellaluna* and discuss with the children if Stellaluna's idea about vision is correct. **Social Studies:** Research the history of the periscope.

Cluster 4: Opaque, Translucent, and Transparent Materials (Lessons 7-9)	Cluster 5: Summative Lessons (Lessons 10-11)	
Children explore what happens to light as it shines on three types of materials: transparent, translucent and opaque. They manipulate an opaque material to make it translucent. They observe pencils in different types of transparent liquids to understand that light changes directions.	Children review what they have learned about light by revisiting the questions they asked at the beginning of the unit, and by revising their science notebook models of how light travels. They role play two different scenarios that model the behavior of light.	**Overview**
• Transparent, translucent and opaque materials let different amounts of light pass through them. • Translucent materials allow some light to pass through them. • Opaque materials do not allow any light to pass through them. The light is either absorbed, reflected, or a combination of both. • Transparent materials allow most light to pass through them. • Light can change direction as it passes through transparent materials.	• Light travels in straight lines. It moves outward in all directions from a source until it hits something. • When light hits something, one or more of three things can happen: the light can bounce off it, go through it, or be absorbed by it. • You see when light comes into your eye.	**Science Content**
• Continue to test and categorize different types of materials by shining light through them. • Compare shadows cast by transparent, translucent and opaque materials. • Read books about transparent, translucent and opaque materials. • Describe objects viewed through different types of jars.	• Compare the children's models of light from the beginning of the unit and the end by copying and displaying samples of science notebook pages 2 and 3. • Use copies of "Light Journal" pages from the children's science notebooks and other representative work to make and display a class book about what they learned about light.	**Science Center**
• Shine a light through a variety of objects and rank them by the amount of light that goes through each. • Share with family members a reference sheet about opaque, translucent and transparent materials. • Make shadow puppets and think about why a shadow is cast. • Create magnifying lens to observe objects in detail.	• Describe to a family member how people can see a tree.	**Family Links**
• Experiment with a cup of water and a coin to observe how light changes directions. • Investigate how corrective lenses help people to see. • Explore different professions that use lenses.	• Role-play additional scenarios about light's behavior: its sources, how it moves, what happens when it hits different kinds of objects, and how it makes vision possible.	**Further Science Explorations**
Art: Make light catchers using transparent, translucent and opaque materials. Sketch an object, the shadow it casts and the light reflected off the surface. Study works of cubism. **Language Arts:** Construct a book out of transparent, translucent and opaque materials and write down information learned about all three. Investigate how various lenses are used today. Investigate why pioneers often used oiled paper for windows instead of glass.	**Language Arts:** Write "I Learned" pages about light.	**Cross-Curricular Extensions**