


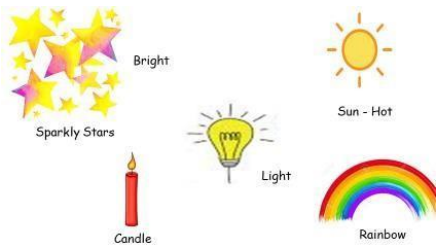






## SHADOW PLAY (LEVEL 2)


<b>Description</b>	Learners will explore the qualities and characteristics of light and shadows. They will create their own shadow theatre by illustrating part of their story, illustrating and cutting their own puppets and setting up the stage
<b>Leading question</b>	What stories can shadows tell us?
<b>Subjects covered</b>	Science, Literacy, Art and Design
<b>Total time required</b>	5 hours over 5 days
<b>Resources required</b>	White sheet, straws/skewers/ toothpicks Light source: Lamp, Torch, Sun etc. Tape, paper, black marker/ crayon, scissors, paint and paintbrush, and pen
<b>Learning outcomes:</b>	By the end of this project, learners will be able to: <ol style="list-style-type: none"> <li>1. Understand the difference between natural and artificial</li> <li>2. Understand the differences between opaque, translucent and transparent objects.</li> <li>3. Understand how opaque objects cast a shadow, and how the shadow appears.</li> <li>4. Investigate how shadows change when the distance of a light source is altered</li> <li>5. Describe people, places, things, and events with relevant details, expressing ideas and feelings clearly.</li> <li>6. Add puppets to descriptions to clarify ideas, thoughts, and feelings when appropriate.</li> </ol>
<b>Previous Learning</b>	None
<b>Supervision required</b>	Medium

### Day 1 –

Today you will explore the properties and qualities of light through this project!

<b>Suggested Duration</b>	<b>Activity and Description</b>
<b>15 minutes</b>	<ul style="list-style-type: none"> <li>● Explore the importance of light so that we can see and to provide heat. Draw a scene in the daylight and night – think about the different things we do when it is light or dark.</li> <li>● Explore that most of your working time is in the day with the sunlight and most people sleep in the night in the darkness</li> </ul>

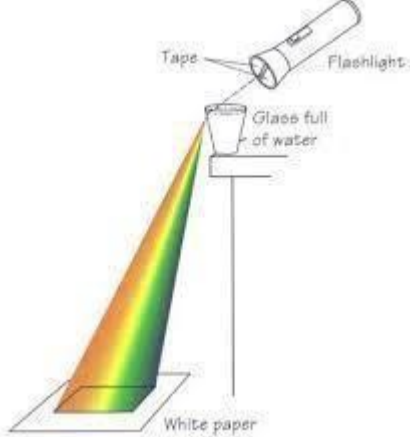
					
<p><b>15 minutes</b></p>	<ul style="list-style-type: none"> <li>● Draw an image of “light”. Think of how you can draw and show light and draw this. Think of all the words you associate with light.             <ul style="list-style-type: none"> <li>- What color do you associate with light?</li> <li>- How would you describe light?</li> <li>- What are the main sources of light?</li> <li>- Do you think of hot or cold when you think of light?</li> </ul> </li> <li>● Illustrate and label each of these answers in 5 adjectives you associate with light for example: bright, sun, yellow etc.</li> </ul> <div style="text-align: center;">  </div>				
<p><b>15 minutes</b></p>	<ul style="list-style-type: none"> <li>● Identify sources of light and make a list of five different sources of light. Characterize your examples as artificial (man made) or natural.</li> <li>● Input: Parents may support the learners with input on this including:             <ul style="list-style-type: none"> <li>- Natural: Sun, Stars, Moon, Flame (Candles, Stove), Lightening etc. -</li> <li>- Artificial: Light bulb, Torch etc.</li> </ul> </li> <li>● Draw the different sources within each of the columns:</li> </ul> <p>Sources of light</p> <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th style="width: 50%;">Natural</th> <th style="width: 50%;">Artificial</th> </tr> </thead> <tbody> <tr> <td>                     Sun   </td> <td>                     Bulb   </td> </tr> </tbody> </table>	Natural	Artificial	Sun 	Bulb 
Natural	Artificial				
Sun 	Bulb 				

	<p>fire</p> 	
<p><b>15 minutes</b></p>	<ul style="list-style-type: none"> <li>● Share your table of natural and artificial sources of light with your family members for feedback. Family feedback will include:</li> <li>● Other possible sources of light</li> <li>● What does this list make you wonder about the difference between natural and artificial?</li> <li>● Use the feedback to include additional sources of light in your table and write down your own definition of “natural” and “artificial.”</li> <li>● Explore what happens without lights and how the different senses work together. Play a game in a dark room. In this game, turn off all the lights of the room and make it dark. The family members will call out and you will try to find them based on their voice. Think about how your different senses of sound and sight work together, there are animals like bats that are blind but follow sounds and echoes.</li> </ul>	

## Day 2 –

Today you will continue to explore the properties of light and color.

<p><b>Suggested Duration</b></p>	<p><b>Activity and Description</b></p>
<p><b>20 minutes</b></p>	<ul style="list-style-type: none"> <li>● Conduct an experiment on how rainbows are formed. Place a white paper or sheet on the ground or a table. Fill a glass with water and hold this against the sun – as the light goes through the glass of water it reflects a rainbow on the white sheet of paper</li> </ul>
	<ul style="list-style-type: none"> <li>● Paint over the reflected rainbow that is on the paper with colors and paints.</li> </ul>

	 <ul style="list-style-type: none"> <li>● Input: This is called the prism effect. When different colors of light hit a prism, or an object with 2 sides that are not parallel, they leave at different angles (refraction) so they separate.</li> <li>● Understand that sunlight has all the colors. Paint over the reflected rainbow that is on the paper with colors and paints</li> </ul>
<p><b>20 minutes</b></p>	<ul style="list-style-type: none"> <li>● Based on this experiment, is it correct to say that “sunlight has all the colors”? Why or why not?</li> <li>● Explore how colors mix to create new colors. Experiment with mixing different colors of paint to see what happens. Learners will start mixing combinations of the primary colors of (red, blue and yellow) following this order:             <ol style="list-style-type: none"> <li>a. What happens if we mix red and yellow?</li> <li>b. What happens if we mix red and blue?</li> <li>c. What happens when we mix yellow and blue?</li> <li>d. What other combinations can you think of?</li> <li>e. Can you make a maroon, a pink?</li> <li>f. Can you make your favorite color? How would you name your favorite color?</li> </ol> </li> </ul>
<p><b>20 minutes</b></p>	<ul style="list-style-type: none"> <li>● Write the “math – equations” on the result as a list, for example:             <ul style="list-style-type: none"> <li>● Red + Yellow = Orange</li> <li>● Red + Blue = Purple</li> <li>● Yellow + Blue = Green</li> <li>● Favorite color[name it however you would like]= [quantity]_____ + [quantity] _____ + [quantity] _____</li> </ul> </li> </ul>

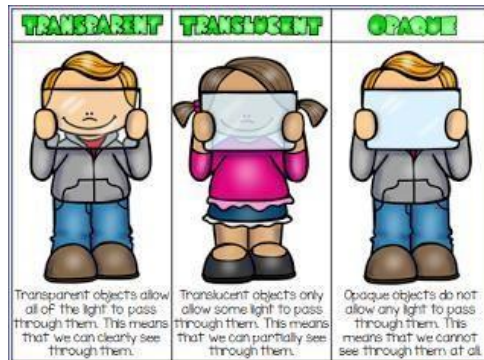
Share your formulas with family members for feedback. Family feedback will include:

- What was your favourite part of the process?
  - What did you learn during the process?
- The family members can also challenge the learners on what colours to mix to get certain secondary colours

Part 2. Explore how some things are transparent, translucent or opaque by holding up items against a source of light.

Learn new terminology and explain:

- Transparent materials include glass, windows, clear plastic etc. that you can clearly see through since all light passes through
- Translucent materials include sunglasses, white shirt, paper towel, white sheet etc. that you can partially see through since some light passes through
- Opaque materials include a chair, a cardboard box, a book etc. that no light passes through and you cannot see anything through.



Explore (hold against direct sunlight, a lantern, or a lightbulb) different materials or objects and sort them out as transparent, translucent or opaque. Brainstorm a list of at least five objects or materials that you would like to explore. To record your observations, write or draw the items across three columns in a chart like the following:

Transparent	Translucent	Opaque



Translucent, Transparent & Opaque

• Make a list writing or drawing the items within the three columns of transparent, translucent and opaque  
 • Share the list or drawings of transparent, translucent and opaque items. Family members give feedback indicating ideas of other things that you could explore.

**Day 3 –**

Today you will explore the sun’s patterns and the impact of shadows.

Suggested Duration	Activity and Description																
	Track the sun’s movements through the day and see where it is from their window. Illustrate this in a schedule answering the following questions:																
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;"></th> <th style="width: 20%;">Sunrise</th> <th style="width: 20%;">Mid-day</th> <th style="width: 30%;">Sunset</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">Where do you see the sun from their window?</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding: 5px;">How bright is the sun?</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding: 5px;">How big is the sun?</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		Sunrise	Mid-day	Sunset	Where do you see the sun from their window?				How bright is the sun?				How big is the sun?			
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Where do you see the sun from their window?																	
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	<p>What is the color of the sky around it?</p> <p>Draw and label images of sunrise, mid-day and sunset based on the above</p>  
<p><b>5 minutes</b></p>	<p>Numeracy extension: read the time and write that down for the different time of the day that you are illustrating e.g. sunrise (5:45 am), mid-day (12 pm) and sunset (6:15 pm). Conduct subtraction to see how many hours it takes the sun from sunrise to mid-day.</p>
	<ul style="list-style-type: none"> <li>• Now, explore the concept of shadows – a shadow is made when an object blocks the light – this is for opaque objects. A shadow can show an object's shape, but it cannot show colors or details (like a smile or a frown).</li> <li>• Place small toys or objects in the sun and place a paper underneath it. Try and trace the shadows of their toys.</li> </ul>



- Try to form shadows of their own body and move around to see how your shadows move – form a sundial to mark your own shadows at different times of the day standing at the same place. Notice where your shadows move on the ground and the length of your shadows
- Notice where your shadows move on the ground and the length of your shadows. Prompts: Is your shadow always the same? How does it change? What are some reasons that can explain why it changes?

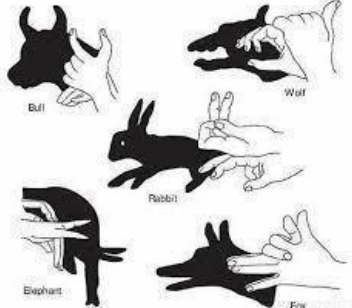


#### Day 4 –

Today, you will begin to plan for your shadow puppet theatre!

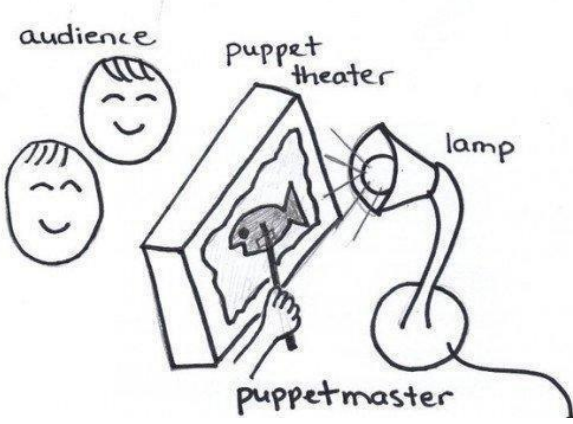
Suggested Duration	Activity and Description
30 minutes	<ul style="list-style-type: none"> <li>• Use a torch or the sun to form shadows with your hands and form different animals and characters to try and have your family guess what these different shadows are.</li> </ul>



	
<b>20 minutes</b>	<ul style="list-style-type: none"> <li>• Think of a basic story that they will represent through a shadow theatre. They will make puppets whose shadows will represent the characters of the story.</li> <li>• Illustrate or write out the story. To make the writing process easier, you can adapt a section of a story that you already know. Think of a fairytale like the Hare and the Tortoise Race or Jack and the Beanstalk. Ideally, you will pick a story with not more than 2 or 3 characters: a wolf, a princess, a rabbit and props including the sun, a house, a cloud etc.</li> </ul>
<b>30 minutes</b>	<ul style="list-style-type: none"> <li>• Design the main characters and props of shadow theatre as puppets. Then draw the main outline on paper or cardboard and color this inside with black crayon, paint or marker.</li> <li>• Now cut out these characters or props and stick them using tape on toothpicks / chopsticks</li> </ul>

**Day 5** - Today you will begin to set up and present your shadow puppet theatre!

<b>Suggested Duration</b>	<b>Activity and Description</b>
<b>30 minutes</b>	<ul style="list-style-type: none"> <li>• Design the “stage”.</li> </ul> <p>Find a place to hang a large white bedsheet or shadow screen – it can be hung on a door frame (it is better if the screen is straight)</p> <p>There needs to be space behind the screen for the learners to stand and hold the puppets</p> <p>The bottom half of the screen can have a desk or table so learners can hide behind it when they operate the puppets</p> <p>Find a good source of light e.g. sunlight or a lamp / torch behind the screen</p> <p>There needs to be space in front of the screen for audience to sit</p>

	<ul style="list-style-type: none"> <li>Use a doorframe –make the screen: pin a large sheet of paper on the frame or hang a sheet from the rod.</li> </ul> 
<b>10 minutes</b>	<ul style="list-style-type: none"> <li>Play with light and experiment with it guided by their insights on the first part of the project until you discover its effects on the shadows your puppets make. Learners will quickly discover that the shadows grow larger when the puppets are close to the light source, and smaller when they are further away</li> </ul>
<b>10 minutes</b>	<ul style="list-style-type: none"> <li>“Act” out the story using these puppets and props and try and simultaneously narrate or tell the story. Add music or sound effects for e.g. a plastic bottle with little stones as a shaker for rain etc.</li> </ul>
<b>10 minutes</b>	<ul style="list-style-type: none"> <li>Now, act the play for their family.</li> </ul>
<b>10 minutes</b>	<ul style="list-style-type: none"> <li>Ask family about their opinion about the play: Did they understand the characters based on the shadows? Did the family members like the story? Did the family members enjoy any additional effects of sound or the narration of the story?</li> </ul>

<b>Additional enrichment activities:</b>	- Learners can design more complex shadow puppet theatre.
<b>Modifications for simplification</b>	- Learners can work on days 3 – 4 and 5 of the project to explore shadows and create their own shadow theatre.

## ASSESSMENT CRITERIA

A majority of my learners were able to:

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EAA welcomes feedback on its projects in order to improve. For feedback please use this link <https://forms.gle/pVXs3vQEufuzSShs7>

- Draw and label illustrations.
- Showcase creativity and simplicity through the story and character puppets
- Narrate and retell the story
- Distinguish between objects as opaque, translucent or transparent