



## Title: Licht und Schatten – light and shadow

Aim	<p>As the children seek out "shadow searching" and explore both their own shadows and the shadows of different objects, they should ...</p> <ul style="list-style-type: none"> <li>• discover that the creation of shadows always requires light and light-blocking objects or people.</li> <li>• discover the causes of a shadow changing its length or direction.</li> <li>• become more familiar with relationships of directions, shapes, proportions, and distortions, and develop the ability to change shadows.</li> <li>• be encouraged in their creativity, relate scientific findings to art and create their own paper-cut portraits.</li> </ul>
Tools I need	<p>Rule pictograms for working on stations, earth globe model, tennis ball, image of the lunar eclipse (impulse), 5 light sources (eg OHP, table lamps, floor lamps, ...), 5 flashlights, 6 white wall surfaces, white sheets or canvases, 6 station orders + solution sheets, geometric bodies (Cube, ball, cuboid, cones, cylinder), template folder for shadow figures, cardboard templates for Max and Mia (alternatively: small and large figures), research folders for the children including two additional worksheets, white drawing paper, tape or magnets, pencils or black Felt-tip pens, black cardboard, glue sticks, scissors</p>
Preparations	<p>The individual stations are set up in six different locations in the classroom with the corresponding materials.</p>
What to do	<p>The teacher introduces the main theme "light and shadow" by means of an impulse (lunar eclipse), makes assumptions and transfers to scientific research questions and inquiries. She then gives instructions for carrying out the wards and discusses the procedure with the children. The children work consecutively at the various wards, making guesses, reviewing them and documenting their results in the research booklet (sometimes using additional worksheets). At the end there will be a joint reflection in which the initial problem (lunar eclipse) will be taken up again and put into relation with the findings of the children.</p>
What I get / results	<p>The assumptions and findings of the children are verbalized, actively reviewed and documented in the research booklet. In addition, creative, artistic implementations in the form of shadow theater performances (shadow figures) and paper-cut portraits are created.</p>

## The STEAM approach:

<b>S</b>	Search	Through the action-oriented examination of different researcher questions and tasks at different stations, the children discover the characteristics of and connections between light and shadow.
<b>T</b>	Think	Due to the various problems and the resulting research questions and researcher assignments as well as the instructions for carrying out the individual ward tasks, the children are made aware of the subject and made curious.
<b>E</b>	Experience	<ul style="list-style-type: none"> <li>• Station 1: What shadows can you create with the two flashlights?</li> <li>• Station 2: What are the shadows of the bodies and surface forms?</li> <li>• Station 3: Which hand shadow figures can you create?</li> <li>• Station 4: How to change the shadow size of Max and Mia?</li> <li>• Station 5: How to change the direction of a shadow?</li> <li>• Station 6: How to make a paper cut portrait?</li> </ul>
<b>A</b>	Active learning	The children perform the individual experiments in partner work or groups of three at the various stations.
<b>M</b>	Motivation	The construction of the different stations, the dealing with the topic as well as the linking of science and art are very motivating for the children.

Ressources / Links:	<ul style="list-style-type: none"> <li>• <a href="https://www.haus-der-kleinen-forscher.de/de/praxisanregungen/experimente-themen/licht-farben-sehen/kategorien/zeige/detail/licht-farben-sehen/">https://www.haus-der-kleinen-forscher.de/de/praxisanregungen/experimente-themen/licht-farben-sehen/kategorien/zeige/detail/licht-farben-sehen/</a></li> <li>• Licht und Schatten: Jungas, A. / Sommerlatte, A.; SINUS-Transfer Grundschule; Voerster, C.; LISUM – Berlin; Grundschule am Rüdesheimer Platz</li> <li>• <a href="http://supra.physik.uni-muenchen.de/">http://supra.physik.uni-münchen.de/</a></li> </ul>
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