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| **Lesson Title:** The Shadow Show |  |
| **Grade Level:** First | **Quarter:** 3 |
| **Standards:** **Science:****S1P1a** Sources of LightRecognize sources of light.**S1P1b** ShadowsExplain how shadows are made.**Math:****MCC1.G.2**Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape (Students do not need to learn formal names such as right rectangular prism). |
| **Lesson Essential Question:**How are shadows made?How can I create new shapes? | **Vocabulary:**light source, shadow |
| **Lesson Materials:** pattern blocks, heavy duty construction paper or cardstock, popsicle sticks, wooden chopsticks, dowels, scissors, tapeThin construction paper will work but students will need extra tape/glue so the puppets aren’t wobbly. various light sources: lamp, overhead projector, flashlight, lantern, sunlight, battery powered “candle” *Blackout* by John Rocco | **Lesson Assessment:** Student JournalTeacher ObservationsStudent should be assessed on the accuracy of the identification of shapes used in this project and their ability to explain how a shadow is created.  |
| **STEM Challenge Overview:**Students will be combining 2D shapes to make an object that will be used as shadow puppet. Students will compare different sources of light to see which works the best to make a shadow.  |
| **Teacher Background:**Step One: Students will learn that light comes from various sources and how shadows are madeStep Two: Students will test various light sources to see which makes the clearest shadowStep Three: Students will work in groups of 4 to construct a set of different objects that are composed of various 2D shapes that will be used in a shadow puppet show. |
|  **INSTRUCTION** |
| 1. **Ask/Engage (Day One- 45 minutes)**
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| Tell the students that you have a design challenge that involves shadows and you will give them all of the details on the following day, but today, we first need to learn about shadows. When doing the first part of this lesson, it is fun for the kids if you turn out your classroom lights when the lights go out in the story and finish reading the story using a flashlight. Start the lesson by reading the book: *Blackout* by John Rocco. As you read, point out all of the different sources of light that are used in the book, such as candles, flashlights, electric lights, stars. Ask students if they can think of any other sources of light. Write down all of the sources of light on a piece of chart paper. Using a flashlight or other light source, demonstrate to students how blocking all light results in a blackout, and blocking some of the light with an object causes a shadow to be made. Students should understand that you need BOTH light and an object blocking the light to make a shadow. As a class, test different types of light sources to see which ones make the clearest shadow by blocking various light sources (flashlight, overhead projector, lantern, lamp, battery powered candle) with the same object (a cut out of a word, a star, or numbers would all work well) Before you test each light source, ask students to make a prediction as to which one they think will work the best. To complete, take the kids outside on a sunny day and ask them to work with a partner to trace each other’s shadows.  |
| 1. **Imagine/Brainstorm (Day Two- 30 minutes)**
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| Introduce the design challenge to students by showing students the following video: <http://www.youtube.com/watch?v=pSVd_0AKTKc>It’s your turn to tell a story using shadow puppets. Your class will be putting on a shadow puppet show that highlights how you can mix different shapes to make common objects! You will need to work with your groups to put together a puppet show. * Each student will be responsible for designing their own puppet.
* Each puppet should contain at least 2 newly composed 2D shapes
* Each student will collaborate with their group to develop a short 1-minute shadow puppet show
* Each group will choose a specific source of light to use when performing their puppet show

https://encrypted-tbn3.gstatic.com/images?q=tbn:ANd9GcR1WZtnTJFj0lUky97w1pOfAhGwBhSQrl_s4HazPEkrq8vxhYO- Show students the above picture and ask them which shapes are used to construct the house. Tell students that they are going to be combining 2D shapes to make objects that will be used in a shadow puppet show. You can demonstrate how the house looks as a puppet by printing out the house on cardstock, cutting it, gluing it to a wooden stick and placing it front of a light source. As part of the brainstorming process, students can use pattern blocks to come up with ideas for their shadow puppet. Students should come up with at least 2 possible ideas for making a 2D shape puppet. They can trace their ideas on paper to show their groups. Students should know the names of the shapes that they are using.  |
| 1. **Plan/Design (Day Two- 30 minutes)**
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| Each student should present their ideas to their other group members. Groups should collaborate to decide which puppets will be made and the story that they will present during their shadow puppet show. Students should write down their final plan in their journals and create a list of supplies that they will need.  |
| 1. **Create / Test (Day Three- 60 minutes)**
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| Students should refer to their journals for their design plan and work together to construct their 2D shape shadow puppets. Students can use pattern blocks to construct their design and then trace it on to cardstock or heavy duty construction paper to be cut out. Once they have cut out their shape, they can glue it to a wooden stick. Teacher should set up an area for students to practice their puppet show with various sources of light.  |
| 1. **Evaluate/Improve –** and repeat Steps 1-5
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| Student groups should present their puppet shows. Each student should take a moment to explain their puppet and accurately name each of the shapes that they used to construct their puppet. They should also explain which source of light that they used and why.  |
| Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_C:\Users\ccc10193\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\YYXSSUPT\MC900221849[1].wmf The Shadow Show  1st GradeDescription of STEM Challenge **Challenge**: It’s your turn to tell a story using shadow puppets. Your class will be putting on a shadow puppet show that highlights how you can mix different shapes to make objects. You will need to work with your groups to build puppets using common shapes. **Criteria/ Constraints:**•Each student will be responsible for designing their own puppet. •Each puppet should contain at least 2 newly composed 2D shapes•Each student will collaborate with their group to develop a short 1- minute shadow puppet show•Each group will choose a specific source of light to use when performing their puppet show**Materials:**pattern blocks, heavy duty construction paper or cardstock, wooden chopsticks or dowels, scissors, tape |
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**How does your garden grow?**

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| **Date/Time** | **Which parts of the plant can you see?** | **Soil Conditions (dry, damp, wet, soggy)** | **What is the height of your plant?** |
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**Here is a drawing of my plant. I have labelled all of the plant parts.**

**My plant needs \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to grow.**

**My plant grew \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ inches in \_\_\_\_\_\_\_\_\_\_\_\_ days.**