

Shadow Casters

Shared by: MIT K-12 Maker Lab team

Specialized tools and materials used:	Experience level required:
Template for base and support pieces	Beginner
Copper tape with conductive adhesive	Beginner

Grade Level and Subject (of this example): Reading, 5th Grade

Topic/Content Standards (for this example): Determine a theme of a story, drama, or poem from details in the text [\[RL.5.2\]](#)



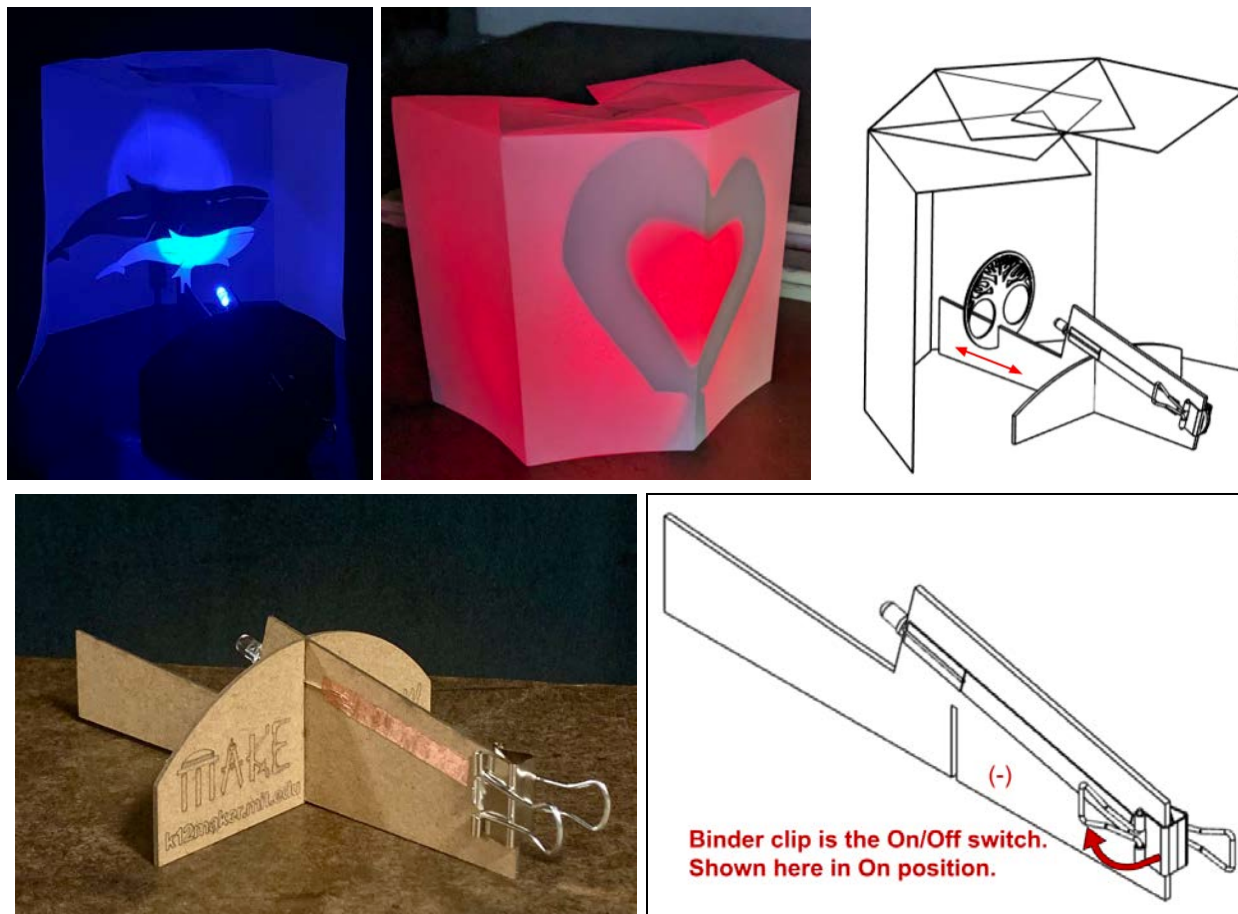
Summary of Project:

Students cast unique and interesting shadows using a hand-fabricated LED projector, and their own custom shapes to express thoughts and ideas. The project above comes from a 5th Grade Reading class and reflects on themes found in *Bridge to Terabithia*. The prompt for the shapes was for students to choose “an idea you want to project into the world”, or “a part of the story that had meaning for you”.

The project involves problem-solving and redesign as well as basic electric circuits. Once the base is constructed and the circuit functions, students experiment with several shadow caster shapes at varying distances from the LED light.

Each student constructs their own projector, circuit, and projector screen. The LED circuit is from the well-known popsicle-stick flashlight circuit, and is a nice way to build and demonstrate a simple circuit with easy materials. The projector screen can be made from a piece of opaque paper. With transparent paper, such as vellum, the image can be projected to the outside of the screen. For spaces with a lot of light, try making a shadow box or using a cabinet. The projector base can be hand-fabricated individually,

or made in advance with a laser cutter. Templates for the projector base and detailed instructions are provided in the Resources section of this write-up, though the “shadow caster” concept can be implemented in many ways.



Resources

- [Template](#) for base and support pieces
- [Build Guide](#) with diagrams and step by step instructions
- [Shadow Casters project tutorial slides](#) with photos and step by step instructions

Possible Content explorations [example MA Content Standards]

- **ELA:** Storytelling and oral tradition; creative writing; examination of setting, scenery, or interactions
- **SEL:** Personal mythology [[Self Awareness](#)]
- **STEM:** Exploration of light waves [[1-PS4-3](#)]