

### **Action Shadow**

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Type: Design Problem  
Student time: 5 weeks  
Location: Take home

### **Summary**

This project is to design a means by which a shadow of a teeter-totter with one kid on each end is projected on the ceiling or wall. The entire system, including the teeter-totter and the illumination means must be designed. Teams of three to four, possibly interdisciplinary and including an industrial design major or art major would expose students to working on interdisciplinary projects.

The students are to experiment with different alternative designs that they build. Any design is acceptable as long as it looks like two kids are playing on a teeter-totter rocking back and forth. Even optical illusions could be used to stimulate their imagination. They should choose an alternative that they like aesthetically, and construct the final product. A contest will be held to determine first, second and third place winners. The whole class, as well as the instructor, and maybe someone from the Art Department, will evaluate the designs. It is suggested that students show their product and evaluate the marketability of the product.

### **ABET Descriptors:**

Eng. Sci. Content: First Year Engineering, or aesthetics of mechanical/electrical systems.  
Type: System.  
Elements: Synthesis, construction, testing, evaluation.  
Features: Creativity, alternatives, selection, imagination.  
Constraints: Aesthetics, time, market research.  
Effort: Team, possibly interdisciplinary

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### Problem Statement:

Compose a team of three to four students, and try to find students in other majors that can work with you. Include an industrial design major or art major if these are offered at your university. In industry, it is important to work together on teams with others from different fields.

You are to design a means by which the shadow of a teeter-totter with one kid on each end is projected on the ceiling or wall. You must design the entire system, including the illumination means or projector.

Experiment with different alternative preliminary designs. Any approach is acceptable as long as it *looks like* two kids are playing on a teeter-totter rocking back and forth. Even optical illusions could be used. You should choose an alternative that you like aesthetically, and construct the final product. A contest will be held to determine first, second and third place choices. The whole class, as well as the instructor, and maybe someone from the Industrial Design or Art Department, will evaluate the designs. Evaluate the marketability of your design. See if you can make a profit and if anyone would buy your product.

Determine:

1. Cost of unit.
2. Input power requirements.
3. Ease of use.
4. Constraints, such as, does the room need to be dark?
5. Aesthetically pleasing appearance.

Evaluation criteria:

Originality, cost, report, aesthetics.

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### **Engineering Notes:**

### **Objectives/Comments:**

This is an exercise to encourage working together in an interdisciplinary group. It exposes the student to teaming with others from different majors, creativity, artistic ability, and aesthetics.

### **Follow-up:**

Another project might be to design a projection system for a particular application. The operation of projectors and video monitors could be discussed.