Topic: Waves and Electromagnetic Radiation

How can you design a system to stop a thief?

How Did I Do? Use the rubric below for the Quest *To Stop a Thief* as you design an optical security system to protect a gemstone exhibition in a museum.

	Outstanding **Score your work 10–9 *if*:**	**Accomplished** **Score your work 8–7 *if*:**	**Developing** **Score your work 6–4 *if*:**	**Beginning** **Score your work**
Criteria and Constraints **Your company gave you the following criteria and constraints: You must use at least one lens. You must use at least two mirrors. You must develop a solution in which the light travels no more than 1.5 meters total. You must use a flashlight as the source of light.**	☐ All of the criteria for your design of an optical security system were met. ✓ One lens and two mirrors ✓ A flashlight as a source of light ✓ The light travels no more than 1.5 meters total. ☐ You worked within all the constraints.	☐ Most of the criteria of your optical security system were met. ☐ You worked within most of the constraints.	☐ Some of the criteria of your optical security system were met. ☐ You worked within some of the constraints.	☐ None of the crite met. ☐ You completely outside of the constraints.
Engineering Design **The manager of your company's design team will want you to use good design processes.**	☐ All of the steps of the design and engineering process were completed, including testing and modifying your solutions.	☐ Most of the steps of the design and engineering process were completed, including testing and modifying your solutions.	☐ Only a few parts of the design process were used, and your solutions were not tested or modified.	☐ No evidence of design process used.
Communicate Your Final Design **You demonstrated your design. Your supervisor wants to make sure that you understand the science behind your design.**	☐ Your design successfully achieves the goal of getting a beam of light around an obstacle in order to hit a target. ☐ You demonstrated a complete understanding of how lenses and mirrors affect the behavior of light.	☐ Your design achieves the goal of getting a beam of light around an obstacle in order to hit a target. ☐ You demonstrated some understanding of how lenses and mirrors affect the behavior of light.	☐ Your design did not achieve the goal of getting a beam of light around an obstacle in order to hit a target. ☐ You did not demonstrate an understanding of how lenses and mirrors affect the behavior of light.	☐ You did not cor your design. ☐ You did not sho understanding lenses and mir the behavior of