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Experimental and Analytic Analysis on Double Parabolic Solar Reflectors YUN JIN JEONG, Emma Willard School, JAE WON LIM, Whitestone Academy — Although solar energy is currently an abundant and widely used renewable energy source around the world, one of its biggest drawback is its low efficiency in converting sunlight into usable energy. Thus, increasing the efficiency of the panels is the biggest concern that must be addressed in order to develop solar energy as a source that can replace fossil fuels in the coming future. Solar energy is converted from sunlight into electricity, thermal energy, and other types of energy. One of the most common ways to harness solar energy is through solar panels, reflectors, and concentrators, which are equipped with solar cells or photovoltaic cells. To find the optimal environment for maximizing efficiency of solar energy production, this research conducts experiments that test new combinations of reflectors . The reflector components on the system are altered to achieve highest efficiency. The first proposed reflector has primary and secondary parabolic reflectors, and the second proposed reflector has double parabolic reflectors with Fresnel Lens. By changing the location of Fresnel Lens, the foci of the two parabolic reflectors are calculated and the amount of electricity is measured by a voltmeter.

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