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A redesign and analysis of the PhET Geometric Optics simulation for effective science education SARAH CHANG, Swarthmore College — Geometric optics is a confusing subject for many physics students, who often first encounter the subject in introductory college physics classes. Traditional instruction in geometric optics involving lectures and physical laboratories have been shown to be less effective than using interactive, online simulations. In 2004, PhET Interactive Simulations created a geometric optics Flash simulation, but all modern browsers have eliminated support for Flash as of January 2021. In response, we redesigned and redeveloped the simulation from scratch in Javascript/HTML5, adding new features to expand on the learning goals and address common student difficulties found in the literature. We assessed the effectiveness of the redesign through think-aloud student interviews and revised the design of the simulation based on that feedback. A public prototype of the simulation is now available for use and will be a valuable resource in geometric optics curricula around the world.

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