A Connection between Geometrical Optics and an Elementary Kinematics Experiment NELSON ZAMORANO, Physics Department, FCFM, Universidad de Chile, LUIS ARGOMEDO, Colegio El Nocedal, La Pintana, Santiago, Chile, RICARDO HENRIQUEZ, Departamento de Fisica, Universidad Técnica Federico Santa Maria — Using an old device like the rail and a steel ball, we propose to show the students a connection between the kinematic of a ball with a constant speed and the trajectory of a light ray going between two points located at different media separated by a flat interface. Releasing the ball from two different heights, the students, using a free software, obtain two graphs of position vs. time. With this information, they have to set another graph. First they must draw five (for instance) different paths for going from the point in medium 1 to the other in medium 2. Next, they must compute the time it takes to cover the distance between the two points chosen at initio for the different paths, using only a ruler and the data from the kinematics graph. From this exercise the students learn that the straight line is the shortest in distance but not in travelling time. With elementary trigonometry they arrive to the rules for the geometrical optics. The experiment should end with a display a real light ray travelling along different media. There are other applications, in a different context, that can be used with this structure. This experiment is, in our opinion, a good practice for the use of graphs and the handling of information. They also learn about elementary path integrals.

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