Siam Physics Congress 2017



Contribution ID: 112

Type: Poster

DIY Low Cost Thick Lenses kit Applied Teaching of Parallel light rays passing through lenses in either direction in Physics

Wednesday 24 May 2017 15:45 (15 minutes)

The Thick lenses was developed and fabricated by DIY (Do it yourself) Low Cost process that applied teaching the focal length for parallel light rays passing through lenses in either direction in Physics, to increase good achievement and attitude of students. This instrument kit was made form transparent acrylic Perspex thickness of 2 mm. It was cut rectangle form an area the size 2x15 cm2 and bent by heat air blower. Next, two plastic bend which have two spherical surfaces with radii of curvature R1 and R2 of about 3-4.5 cm were composed to be the thick lenses form base on acrylic platform. Next, liquids such as Ice (H2O), water, oil, glycerin and gasoline that have the liquids index of refraction (n) 1.31, 1.33, 1.40, 1.47 and 1.50, respectively, were poured into thin lenses form of acrylic form. The 36 students in grade 10 at Mengraimaharaj Witthayakhom School, Chiang Rai, Thailand, were tested by this instrument. The 5Eenter code heres model of teaching and the one group pretest-posttest design were used to study of education through learning activities. To determine the effectiveness of instrument and learning achievement of students were evaluated by the satisfaction analysis. While the attitude of the students was interpreted by the observation and recording of results from other activities. In this research, it was found that the instrument kit using of 5Es model with this instrument has very useful. The students can be easy understood about the light rays passing through lenses in either direction. The results have shown that the 83.33 percent of students were satisfied to learn. Meanwhile, the enhancing of learning achievement in grade 10 students are 80.92/78.61 percent and the sample was found that the attitude of students increase.

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Session Classification: Poster Presentation I

Track Classification: Physics Education