

Problem-based Learning with Multiple Representations

Activity developed at John Abbott College

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Problem-based learning (PBL) is a collaborative approach that allows students to learn through authentic situations. However, the usual presentation format of these problem situations often remains unauthentic. To optimize authenticity, this activity presents a real-life problem situation that also involve several representation modalities (e.g. verbal, visual, spatial, kinaesthetic, intrapersonal, etc.). Students take on the role of a crime scene investigator to solve a murder. To this end, they must gather information from the scene (measure the calibre of the bullet, which allows them to find the muzzle speed, angle at which the bullet entered a block, etc.) and learn about two-dimensional kinematic motion.

The Crime Scene Investigation problem situation is more authentic than so-called traditional laboratory assignments as it requires students to extract information from an emulated environment. Furthermore, students are not stymied by unfamiliar sophisticated devices since only familiar instruments such as rulers and watches are used. Moreover, since some approximations are required to solve this problem, students realize that a real physics problem is often a matter of making the right educated guesses. In addition, this activity helps to demonstrate that physics is not merely the work of men and women dressed in white lab coats, but a field of knowledge of several public-interest professions.