

15 Shades of Gray: An Exercise in Serial Dilutions for Undergraduate Students

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Many undergraduates struggle with the concept of serial dilutions and making multicomponent solutions. This workshop makes these seemingly abstract concepts tangible, using readily available dyes as a visual representation of molarity. Learning outcomes for this workshop include explaining the advantages of using serial dilutions, accurately pipetting serial dilutions, converting between different metric units and making stock solutions with multiple solutes. After a brief presentation about serial dilutions and molarity, groups of 4-5 students are given dyes diluted to a specific concentration and instructed to make further serial dilutions. These solutions are then arranged based on concentration, using the color of the solution as an indicator of molarity. We then focus on making solutions of varying concentrations, using multiple solutes. This activity uses two separate dyes to create a hue of colors, ultimately creating a spectrum. With many commercial dyes available, as well as common solutions, this activity can be easily incorporated into any undergraduate laboratory course.

Keywords: serial dilutions

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