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Teaching Osmosis and Diffusion through Kidney Dialysis

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The purpose of this unit is to teach middle-school students about osmosis and diffusion in cells. In order to make the material more relevant, the unit will focus on how osmosis and diffusion are two of the processes necessary for urine formation in the kidneys. Students will briefly review the structure of the kidney and how the nephrons help maintain homeostasis in the body. Students will also learn how our current understanding of these cellular functions within the kidney has made kidney dialysis. Students will watch demonstrations of osmosis and diffusion and will also perform several labs, including one in which they will create their own mini kidney dialysis machine in order to filter artificial blood. The unit was developed specifically for eighth-grade students and provides hands-on activities and higher level comprehension questions. However, it could easily be used in a high school biology class with minor changes.

(Developed for Integrated Science, grade 8; recommended for Biology, General Science, and Health, grades 6-9)

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