



Yale-New Haven
Teachers Institute®

Curriculum Units by Fellows of the Yale-New Haven Teachers Institute
2014 Volume IV: Engineering in Biology, Health and Medicine

Repair and Regeneration of the Human Musculo-Skeletal and Cardiovascular Systems

Guide for Curriculum Unit 14.04.10
by Larissa Spreng

Teaching a curriculum unit focused on engineering in biology, health, and medicine will engage in cutting-edge work of the discipline, through topics such as prosthetics, joint replacement, and stem cell therapy. This unit will also focus on problem-solving. Students, like engineers and doctors, will practice thinking critically and creatively to solve problems that relate to the world around them and other fields of science and mathematics. Finally, this unit will provide students with a deeper understanding of STEM careers and hopefully spark their interest.

This curriculum unit addresses engineering related particularly to advancements in orthopedic technology. Orthopedic bioengineering is a way for students to deepen and expand their thinking about the musculo-skeletal and cardiovascular systems. In addition to gaining a deeper understanding of the function of bones, joints, muscles, and the heart, students will see first-hand how scientists and engineers work together to repair injury and counter wear and tear through the design process. Students will also practice using their inquiry skills through a problem-based learning activity. By analyzing – through their own experimental design – how types of materials used for these techniques affect factors such as friction, lubrication, and wear characteristics, students will propose their own engineering ideas.

(Recommended for Science, grade 7)

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