



Curriculum Units by Fellows of the National Initiative
2021 Volume V: Human Centered Design of Biotechnology

STEAM and Human Centered Design of Biotechnology

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by Jesse Baker

How can we increase the overall adoption of biotechnology that is affordable, accessible, and appropriate to improve the human condition? Students will discuss the importance of using the arts to become well-rounded and creative bioengineers to foster a work force that can be effective, sustainable, and fosters innovation. Background information on why STEM vs STEAM is met with skepticism by the scientific community will be researched in this unit. By 2025, the U.S. alone is projected to have 3.5 million STEM jobs, with 2 million of them going unfilled.¹ As introduction to the topic, students will view and discuss MIT Professor Hugh Herr's Ted Talks on bionics. The project workflow will have students view photos of biotechnology on the web and discuss the reasons why this technology exists and why it is important. By integrating the arts into the teaching of STEM subjects, it is clear STEAM becomes increasingly accessible and appealing to more people. Studying art subjects contribute to the development of essential skills like collaboration, communication, problem-solving, and critical thinking. The maker movement reminds us regularly that art and science are inseparable.² This unit is targeted towards fourteen- and fifteen-year-old 9th or 10th grade students in Geometry.

Notes

1. *STEM vs. STEAM, Why STEM Should Welcome the Arts!*, Twist Bioscience, 9 Nov. 2020, www.twistbioscience.com/blog/perspectives/stem-vs-steam-why-stem-should-welcome-arts.
2. Martinez, Sylvia Libow, and Gary S Stager. *Invent to Learn: Making, Tinkering, and Engineering in the Classroom*. Constructing Modern Knowledge Press, 2019.

(Developed for Geometry CAS, grade 9, and Geometry PSP, grade 10; recommended for Geometry, grades 9-10)

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