



**PROJECT TITLE: SYNTHETIC
BIOLOGY AND THE HIGH SCHOOL CURRICULUM**
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GRADE LEVEL(S): HIGH SCHOOL

This project addresses several limitations to the existing AP curriculum, including the limited range of experimental problems that might be addressed, the unwieldy volume of facts students are held accountable for knowing for the AP test, as well as the migration of current AP experimental techniques into pre-AP classes. This unit consists of two labs, an essay assignment, and links to resources.

The unit can be found online at

http://openwetware.org/wiki/synthetic_Biology_and_the_High_school_Curriculum

Lab 1: “Eau that smell”

Objectives:

- Explain how synthetic biology as an engineering discipline differs from genetic engineering.
- Explain the population growth curve of bacteria.
- Define and properly use synthetic biology terms: parts, device, inverter.
- Define and properly use molecular genetics terms: promoter, ribosome binding site, open reading frame, terminator, plasmid,
- Culture bacteria using proper microbiology methods.
- Measure the growth of a bacterial population.

Lab 2: “Tuning a System.”

Objectives:

- Explain how synthetic biology as an engineering discipline differs from genetic engineering.
- Explain the population growth curve of bacteria.
- Define and properly use synthetic biology terms: parts, device, inverter.
- Define and properly use molecular genetics terms: promoter, ribosome binding site, open reading frame, terminator, plasmid.
- Explain the functioning of the lac Operon and relate it to this lab.
- Culture bacteria using proper microbiology methods.
- Measure the growth of a bacterial population.
- Explain the engineering paradigm and the role of tuning a system.