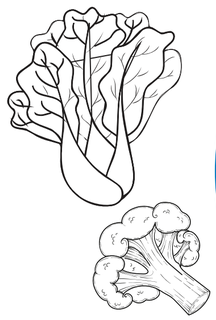
Exploring Precision Medicine

(7–11 class sessions)

Is Taste Genetic?

Begin to explore a trait (taste) and investigate whether different people experience it differently.

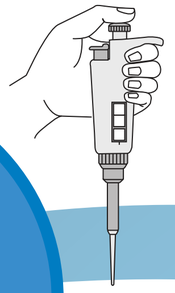


Medical Mystery

Explore the idea that people respond differently to medications and consider the possible reasons.

Sample Our Own DNA

Take sample cheek cells, isolate DNA, and amplify a short sequence of the bitter-taste gene.

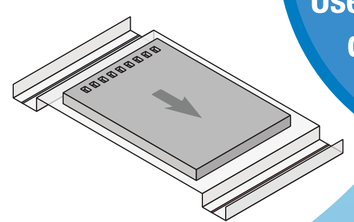


Sequence Analysis

Use bioinformatics software to explore the bitter-taste gene and how genotypes can be distinguished.

Gel Electrophoresis

Use gel electrophoresis to determine our bitter-taste genotype.



Drug Metabolism

Investigate the genetics of drug metabolism and consider how genetics can aid medical treatment.

UNDERSTANDING PRECISION MEDICINE

Genes affect not only visible traits but also traits that cannot be seen, including the metabolism of medications. Our ability to taste bitter substances is controlled by genetics, and this module uses the variability of bitter taste as an analog for the variability of drug metabolism. DNA sequencing and bioinformatics have made it possible for us to discover differences in our genotypes and determine how they affect our phenotypes. The differences in our DNA can be incredibly small—even a single nucleotide can change a phenotype radically. Understanding our genetic differences when it comes to medicine allows doctors to practice *precision medicine*—medicine based on each individual's genotype.