

# 9-12 Science Genomes



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## Overview:

This lesson will challenge students to understand how genomes were discovered and the scientist responsible, understand the Punnett square, and show inheritance patterns mathematical probability.

(Time Needed: 3 class periods.)

## Standards:

- SB3. Obtain, evaluate, and communicate information to analyze how biological traits are passed on to successive generations.
  - a. Use Mendel's laws (segregation and independent assortment) to ask questions and define problems that explain the role of meiosis in reproductive variability.
  - b. Use mathematical models to predict and explain patterns of inheritance.  
(Clarification statement: Students should be able to use Punnett squares (monohybrid and dihybrid crosses) and/or rules of probability, to analyze the following inheritance patterns: dominance, codominance, incomplete dominance.)

## Objectives:

- Students will be able to identify biological traits of plants.
- Students will understand how Mendel's laws explain reproduction variability.
- Students will use Punnett squares to identify the mathematical probability of inheritance patterns of multiple types.
- Students will discuss why this discovery is important and current uses of Mendel's laws.

## Materials:

- Videos:
  - <https://www.youtube.com/watch?v=CBezq1fFUEA>
  - <https://www.youtube.com/watch?v=Mehz7tCxjSE>
  - <https://www.youtube.com/watch?v=cWt1RFnWNzk>

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- Resources

- <http://iyp2016.org/resources/mapping-pulse-genomes>
- <https://www.quia.com/quiz/806830.html>
- <http://anthro.palomar.edu/mendel/quizzes/mendqui2.htm>
- <http://www.csun.edu/~dcw04262/files/pdf/Punnett%20Square%20Practice%20Pages.pdf>
- <http://www.cpalms.org/Public/PreviewResourceLesson/Preview/128824>

## Outline:

- Engage: Students will watch a video that will give them basic information on Mendel.
- Explore: Students will explore how genomes express themselves and make predictions based on current information.
- Explain: Students will use Punnett squares to explain probability.
- Extend: Students will discuss a variety of ways to further their knowledge of genetics.

## Lesson Plan:

- Engage: Show one or more video from the materials list. Be mindful of students' prior knowledge and ability levels.
- Explore: Looking at the [IYP website](#), discuss how legumes/pulses are crucial for global food production and stability. Visit the school garden and identify the legumes being grown. Discuss how being able to breed plants for specific traits is beneficial for today's agriculture.
- Explain: Using the [pdf](#), explain how Punnett squares can be used to determine probability of expressed biological traits.
- Extend: Students can practice using Punnett squares and Mendel's laws with [quia](#) and [palomar](#) websites. Students can also work in the school garden and complete ongoing research using a variety of seeds to explore this further. Science fair projects are also a great way to extend learning.
- Evaluate: Use online quizzes to identify mastery. Also, classroom quiz, test, or lab can also be utilized. [The CPALMS website](#) also has a lab activity for formative assessment.