

Practicing With Punnett Squares



Introduction

After being introduced to Mendelian genetics and monohybrid crosses, students will apply this new knowledge by solving a short series of problems using Punnett squares.



Grade Level: 7-9

Time Needed: One 45-60 minute class period

Learning Objective

After completing this lesson, students will be able to:

1. Use Punnett squares to predict the probable genotypic and phenotypic ratios within different F_1 generations

Materials

- Mendel and Heredity PowerPoint presentation
- Practicing With Punnett Squares Student Activity Sheet

Instructional Process



1. Using the “Mendel and Heredity” PowerPoint presentation (found in the Presentation section of the Get Biotech Smart website), introduce Mendelian genetics and the use of a Punnett square.
2. Pass out the *Practicing with Punnett Squares Student Activity Sheet*.
3. Walk around the room as students are working on the activity sheet problems. Provide assistance to students as necessary.

Next Generation

Science Standards (NGSS)

As a result of activities in grades 7-9, all students should develop:

Topics

- **MS-LS2:** Growth, Development, & Reproduction of Organisms
- **HS-LS2:** Inheritance and Variation of Traits

Performance Expectations

- **MS-LS3-2:** Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.
- **HS-LS3-3:** Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.

Dimensions

Practices:

- Developing and Using Models

Disciplinary Core Ideas:

- **LS3.A:** Inheritance of Traits
- **LS3.B:** Variation of Traits

Cross-Cutting Concepts:

- Patterns



- c) What percentage of offspring would be expected to be blue from the cross of two, heterozygous blue plants?
- d) What percentage of offspring would be expected to be red from the cross of two homozygous recessive plants?
3. Mendel found that crossing wrinkle-seeded plants with pure round-seeded plants produced only round-seeded plants. What genotypic & phenotypic ratios can be expected from a cross of a wrinkle-seeded plant & a plant heterozygous for this trait?
4. A spiny-leaved pointyplant (imaginary plant) is crossed with a smooth-leaved pointyplant. Spiny leaves are dominant (S) and smooth leaves are recessive (s). The cross of two parents produces 78 spiny-leaved pointyplants and 26 smooth-leaved plants. What were the likely phenotypes and genotypes of the parents? Explain your answers.