

Symbols

Vocabulary terms you need to know: dominant, recessive, phenotype, genotype, homozygous, heterozygous, allele

Introduction: Like any language, the language of genetics consists of symbols and rules for using those symbols. For the purposes of this unit, a symbol for an allele consists of one letter. When a trait shows dominance, the capitalized first letter of the dominant form of the trait becomes its symbol. (In humans, for example, free ear lobes are the dominant form of earlobe shape. Attached ear lobes are recessive. Thus, F stands for free ear lobes.) For the recessive form of the same trait, the symbol remains the same but is not capitalized. (Thus f stands for attached ear lobes.)

The table below shows the forms of the traits Mendel studied in peas:

| | stem height | coat color | pod color | seed color | seed shape | flower position |
|----------------|-------------|------------|-----------|------------|------------|-----------------|
| Dominant form | tall | colored | green | yellow | round | axial |
| Recessive form | short | white | yellow | green | wrinkled | terminal |

1. Underline the first letter of each dominant form in the table above. Using the rules described above, complete the following chart of the traits Gregor Mendel studied in pea plants.

| | stem height | coat color | pod color | seed color | seed shape | flower position |
|-------------------------|-------------|------------|-----------|------------|------------|-----------------|
| Dominant allele symbol | | | | | | |
| Recessive allele symbol | | | | | | |

2. Using the symbols from the table above, write the genotypes that would be present in the following phenotypes if they were all homozygous. Next, indicate whether they are dominant or recessive:

| phenotype | genotype | Dom. or Rec.? |
|--------------------------|----------|---------------|
| tall stemmed plants | | |
| terminal flower position | | |
| white seed coat | | |
| wrinkled seed shape | | |
| yellow pod color | | |
| yellow seed color | | |

3. Write the genotype of the following hybrids (also called heterozygotes).

| phenotype | genotype |
|--------------------|----------|
| yellow seeded peas | |
| axial flowers | |
| green podded peas | |
| colored seed coats | |
| round seeds | |
| tall stemmed seeds | |

4. Use Punnett squares to predict the genotypic and phenotypic ratios of the following parental cross.

Tt x Tt

Genotypic ratio:

| | |
|--|--|
| | |
| | |

Phenotypic ratio:

5. Use Punnett squares to predict the genotypic and phenotypic ratios of the following parental cross.

homozygous wrinkled seeds x heterozygous round seeds

| | |
|--|--|
| | |
| | |

Genotypic ratio:

Phenotypic ratio: