A **dominant allele** masks any recessive allele paired with it.
- Only **one dominant** allele is needed to express a trait.

A **recessive allele** is masked when paired with a dominant allele.
- **Two recessive** alleles are needed to express a trait.

**genotype** is the genetic makeup of the organism.
- **Homozygous** refers to having the same alleles for a single trait.
- **Heterozygous** refers to having two different alleles for a single trait.

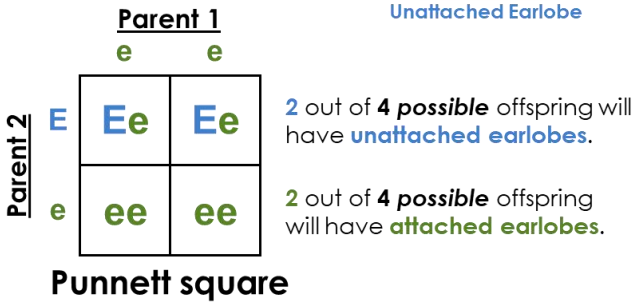
The **phenotype** is the visible characteristic of the offspring.
**Punnett squares** are used to determine the **possible genotypes** of offspring.

Attached Earlobe

**Parent 1:** ee homozygous

**Parent 2:** Ee heterozygous

Unattached Earlobe




**Punnett square**

## CFU

In pea plants, tall alleles (T) are dominant and short alleles (t) are recessive. Will a plant with one tall alleles and one short allele (Tt) be tall or short? How do you know?

A **Tall** B **Short**

What is the difference between dominant and recessive alleles? Which is an example of a homozygous genotype? How do you know?

A **Tt** B **TT**

Which is a genotype? How do you know?

A **bb** B **Blonde hair**

What is the difference between a genotype and a phenotype?

Using the Punnett square for earlobes, what is one possible genotype for the offspring?

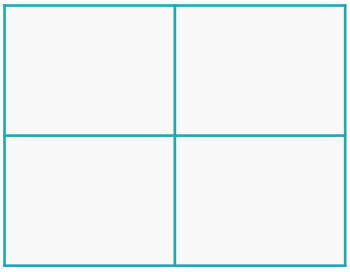
What phenotype will be expressed? How do you know?

**We will predict possible phenotypes of offspring using Punnet square.**

**Skill Development/ Guided Practice**

1. Read the genetic cross and identify the dominant and recessive traits. (underline)
   a. Determine the genotype of each parent.
2. Label the Punnett square with the alleles of each parent.
3. Determine the possible genotypes of the offspring. **Hint: combine parents' alleles.**
4. Interpret the possible phenotypes of the offspring.

**1.** In radishes, bent roots (**B**) are dominant and straight roots (**b**) are recessive. Determine the offspring of a ***heterozygous bent root*** radish crossed with another ***heterozygous bent root*** radish.



Genotype of each parent: _____

Possible phenotypes of the offspring:

_____

_____

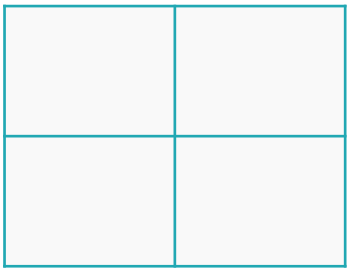
_____

Is it possible for the recessive trait to be expressed in the offspring? Explain.

_____

_____

**2.** In humans, long eyelashes (**L**) are dominant and short eyelashes (**l**) are recessive. Determine the offspring of a ***homozygous long-lashed*** parent and a ***homozygous short-lashed*** parent.



Genotype of each parent: _____

Possible phenotypes of the offspring:

_____

_____

_____

Is it possible for the recessive trait to be expressed in the offspring? Explain.

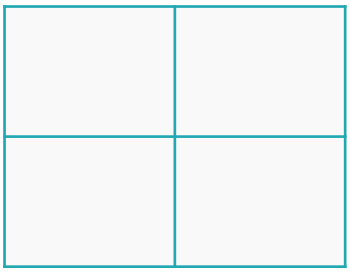
_____

_____

**We will predict possible phenotypes of offspring using Punnet square.** | **Skill & Concept Closure**

1. Read the genetic cross and identify the dominant and recessive traits. (underline)
   a. Determine the genotype of each parent.
2. Label the Punnett square with the alleles of each parent.
3. Determine the possible genotypes of the offspring. **Hint: combine parents' alleles.**
4. Interpret the possible phenotypes of the offspring.

**1.** In pea plants, round peas (**R**) are dominant, and wrinkled peas (**r**) are recessive. Determine the offspring when a ***heterozygous round pea*** and another ***heterozygous round pea*** are crossed.



Genotype of each parent: _____

Possible phenotypes of the offspring:

_____

_____

_____

Is it possible for the recessive trait to be expressed in the offspring? Explain.

_____

_____

**Concept Closure.**
Explain why the following statement is incorrect and provide a counterexample to her claim.

Tabatha concluded that an offspring that expresses a dominant allele in its phenotype cannot have a recessive allele in the genotype.

_____

_____

_____

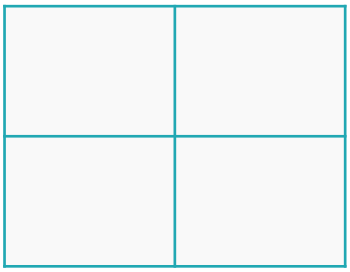
_____

_____

_____

**Identify the traits of each parent, label the Punnett square, and determine the possible genotypes and phenotypes of the offspring.**

1. In humans, brown eyes (**B**) are a dominant trait, and blue eyes (**b**) are a recessive trait. Determine the offspring of a ***heterozygous brown-eyed*** parent and a ***homozygous blue-eyed*** parent.



Genotype of each parent: _____

Possible phenotypes of the offspring:

_____

_____

_____

Is it possible for the recessive trait to be expressed in the offspring? Explain.

_____

_____