



The National  
Orthodox School  
Shmaisani

## The National Orthodox School / Shmaisani

Subject: Biology

Worksheet : Genotype and phenotype

Name:

Answer Key.

Date:

Grade 8 : All sections

*Objective : understand the difference between genotype and phenotype*

A **genotype** is a way to list the genes an organism has, which indicates the actual combination of alleles.

**An example** of a gene that can be passed from a human parent to its offspring is the tongue rolling gene. If **someone possesses both** the dominant and recessive alleles for tongue rolling, we would write his or her genotype as "**Rr**". The capital R shows that there is one dominant allele for tongue rolling, and the lower case r represents the other, recessive allele.

Another person might have **two recessive alleles** for tongue rolling, so his or her genotype would be **rr**. What would be the genotype of a person with two **dominant** tongue rolling alleles?

RR

- Using the letter L to indicate the dominant allele for long eye lashes, and "l" to indicate the recessive allele for short eye lashes, what is the genotype of a person with two **dominant** alleles for eye lash length?-----LL-----

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- Using the letters D for the allele for detached earlobes and d for the allele for attached ear lobes what is the genotype of a person with one dominant and one recessive allele for detached earlobes? Dd
- Using the letter B for the allele for brown eyes, and b for the allele for blue eyes, what is the genotype of a person with two recessive eye color alleles? bb

A **phenotype** is a description of what an organism looks like based on its **genotype**.

### Examples:

A person with the **Rr** genotype for tongue rolling **would be able to roll his or her tongue, because he or she has the dominant allele** that allows tongue rolling. So "tongue rolling" is his or her phenotype.

- A person with the genotype RR would also show the tongue rolling phenotype. What is the phenotype of a person with the genotype rr? No tongue rolling
- A person with the **g**enotype DD would have detached earlobes. What is the **p**henotype of a person with the genotype dd? attached

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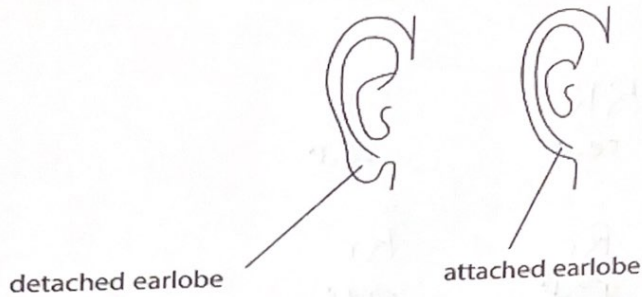


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Check your understanding :

- The earlobes of an individual are detached or attached . This is determined by alleles inherited from their parents .

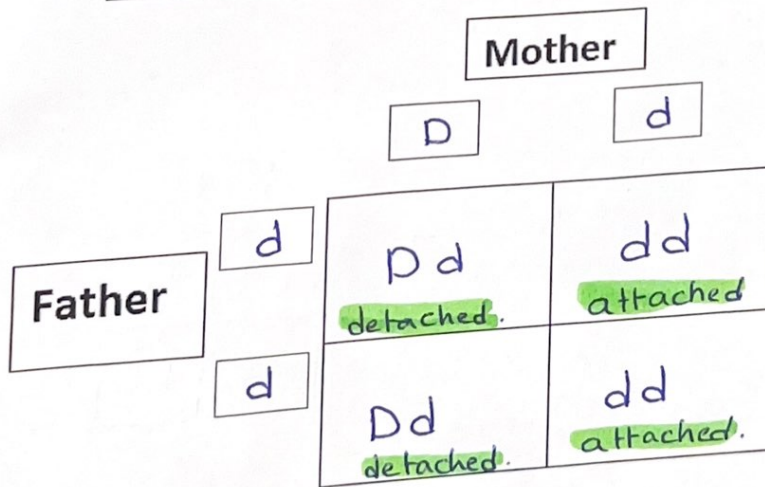


An individual with attached earlobes must have inherited two recessive alleles **dd**.

If the mother has detached earlobes, the father has attached earlobes and their child has attached earlobes.

Complete the square below to show :

- The alleles of the father.
- The alleles of the mother.
- The probability( percentage ) of the next child having detached earlobes .....50%.....



2. The allele for white flowers is recessive to the allele for red flowers .  
Complete the diagram below :

	R	R
R	RR red	RR red
r	Rr red	Rr red

3. A father with the **genotype BB** (B dominant brown eyes) and a mother with the **genotype bb** ( recessive blue eyes ), what is the probability that their baby will have **blue eyes**? Show how you got your answer.

Father  
BB

Mother  
b  
b

Bb	Bb
Bb	Bb

0% blue eyes.

4. What would be the genotype(s) of the offspring from a cross between two organisms with the genotype Tt?

- A all Tt  
B half TT, half tt  
 C quarter TT, half Tt, quarter tt  
D three quarters TT, quarter Tt

	T	t
T	TT	Tt
t	Tt	tt

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