

## Quiz: Mendelian Genetics Quiz

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Multiple Choice: Select the best answer to each question. (Knowledge/inquiry)

1. **The “father of modern genetics” is:**
  - a. Charles Darwin
  - b. Gregor Mendel
  - c. Francis Crick
  - d. James Watson
  
2. **If an offspring is said to be homozygous recessive, which of the following could be its genotype?**
  - a. Rr
  - b. Tt
  - c. ss
  - d. Ss
  
3. **Genotype refers to:**
  - a. The genetic make-up of an organism
  - b. The physical make-up of an organism
  - c. The genetic and physical make-up of an organism
  
4. **If fur colour in mice is caused by the following: B= black and b= brown, choose the genotype for the organism which will have brown fur. (Assume black is dominant)**
  - a. BB
  - b. Bb
  - c. bb
  - d. A or B
  
5. **A specific form of a characteristic that can be inherited is referred to as:**
  - a. Gene
  - b. Chromosome
  - c. Hybrid
  - d. Trait
  - e. mutation
  
6. **Assume that in mice, B=black fur, b = brown fur. If a heterozygous black mouse mates with a homozygous brown mouse, what percent of their offspring will have black fur?**
  - a. 25%
  - b. 50%
  - c. 75%
  - d. 100%

7. What characteristic describes an individual that carries two different alleles for a given characteristic?
- Homozygous
  - Heterozygous
  - Dominant allele
  - Recessive alleles
8. Which one of the following would have a different phenotype from the others?
- Rr
  - rR
  - RR
  - rr

Short Answer: Write your answers to the following questions in the spaces provided.  
(Communication/Application)

1. In Mendel's pea plants, purple flowers (P) are heterozygous dominant over white flowers (p).
- Create a Punnett square for a cross between a homozygous purple flowering plant and a homozygous white flowering plant. What is the phenotypic ratio? What is the genotypic ratio? (4 marks)

	P	P
p	Pp	Pp
p	Pp	Pp

(2 marks)

The phenotypic ratio is 100% purple. (1 mark)

The genotypic ratio is 100% Pp or 100% heterozygous. (1 mark)

- Create a Punnett Square for a cross between a heterozygous purple flowering plant and a homozygous white flowering plant. What is the phenotypic ratio? What is the genotypic ratio? (4 marks)

	P	p
p	Pp	pp
p	Pp	pp

(2 marks)

The phenotypic ratio is 1:1 or 50% purple and 50% white. (1 mark)

The genotypic ratio is 1:1 or 50% heterozygous (Pp) and 50% homozygous (pp). (1 mark)

- c. If you were given purple flowering plant, how would you determine if the genotype of these plant is homozygous or heterozygous? You may use Punnett squares in your explanation. (4 marks)

A **test cross** could be used to determine if an individual is homozygous or heterozygous for a particular trait. (1 mark)

A test cross involves crossing the unknown individual with a homozygous recessive genotype and the results will determine the genotype. (1 mark)

If all the offspring are dominant, then the genotype is homozygous dominant. If half of the offspring are dominant and half are recessive, then the genotype is heterozygous. (2 marks)

	P	p
p	Pp	pp
p	Pp	pp

	P	P
p	Pp	Pp
p	Pp	Pp