

MENDELISM

Principles of Inheritance

Mendel's Three Laws of Inheritance — At a Glance

1. Law of Dominance

In a heterozygote, one allele (dominant) masks the expression of the other (recessive) allele.

2. Law of Segregation

The two alleles of a gene separate from each other during gamete formation; each gamete gets only one.

3. Law of Independent Assortment

Alleles of different genes (on different chromosome pairs) assort into gametes independently of one another.

Comprehensive Illustrated Study Notes

Genetics & Biology | Gregor Mendel's Laws of Inheritance, Monohybrid & Dihybrid Crosses, Chromosomal Theory, and Exceptions to Mendelism

Prepared for academic study & examination revision

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1. Introduction to Genetics and Mendelism

Genetics is the branch of biology that studies heredity (the transmission of characters from parents to offspring) and variation (differences among individuals). **Heredity** explains why offspring resemble their parents, while **variation** explains why offspring are never exactly identical to their parents or to each other.

Mendelism refers to the fundamental principles of inheritance first proposed by the Austrian monk and botanist **Gregor Johann Mendel**, based on his breeding experiments with the garden pea plant (*Pisum sativum*) between 1856 and 1863. Mendel's work established that heredity is governed by discrete, particulate units (later called genes), which are passed from parents to offspring according to definite, predictable rules. This discovery replaced the earlier, incorrect idea of "blending inheritance" and laid the entire foundation of modern genetics.

1.1 Why Mendel Chose the Garden Pea

Mendel's success is largely credited to his careful choice of experimental material. The garden pea plant offered several distinct advantages:

- It is normally **self-pollinating**, ensuring true-breeding (pure) lines, but can easily be **cross-pollinated** artificially by removing the anthers (emasculatation) and dusting pollen from another plant.
- It has a short life cycle and completes generations quickly, allowing several generations to be studied within a few years.
- It is easy to cultivate, hardy, and produces a large number of seeds/offspring per cross, which is essential for reliable statistical analysis.
- Many varieties with clear, easily distinguishable, contrasting (either/or) traits were commercially available — for example, tall vs dwarf plants, round vs wrinkled seeds.
- The traits studied are controlled by single genes with clear dominant and recessive forms, uncomplicated by continuous variation.

2. Gregor Johann Mendel — The Father of Genetics

Gregor Johann Mendel (1822–1884) was born in Heinzendorf, Austrian Silesia (in the present-day Czech Republic). He joined the Augustinian Abbey of St. Thomas in Brno (Brünn) as a monk and later studied natural science and mathematics at the University of Vienna. Between 1856 and 1863, working in the monastery garden, he carried out a systematic series of hybridization experiments on garden pea plants, examining seven pairs of contrasting characters across roughly 28,000 pea plants.

In 1865, Mendel presented his findings to the Natural History Society of Brünn, and in 1866 published them as a paper titled "*Versuche über Pflanzen-Hybriden*" ("Experiments on Plant Hybridization"). Despite the significance of his findings, the work was largely ignored by the scientific community for over three decades.

In 1900, Mendel's principles were independently rediscovered by three botanists working on different plants: **Hugo de Vries** (Netherlands), **Carl Correns** (Germany), and **Erich von Tschermak** (Austria). Their confirmation brought Mendel's work to prominence, and he is now honoured as the "Father of Genetics."

2.1 Why Mendel's Work Was Initially Overlooked

- The mathematical and statistical style of his paper was unfamiliar and unappealing to most biologists of his time, who favoured descriptive approaches.
- The concepts of chromosomes, meiosis, and the physical basis of heredity were unknown in 1866, so there was no framework for biologists to interpret his abstract "factors."
- His paper was published in the relatively obscure *Proceedings of the Natural History Society of Brünn*, which had limited circulation.

- Karl Nägeli, the leading botanist Mendel corresponded with, failed to grasp the importance of the work and encouraged Mendel to repeat his experiments on hawkweed (*Hieracium*), a plant that (unknown at the time) reproduces asexually by apomixis — producing confusing, non-Mendelian results that discouraged further pursuit.

3. Mendel's Experimental Traits in the Garden Pea

Mendel selected seven pairs of easily distinguishable, contrasting (antagonistic) characters, each controlled by a single gene with two alternative forms (alleles) — one dominant and one recessive.

Mendel's Seven Pairs of Contrasting Traits in Garden Pea (*Pisum sativum*)

Character	Dominant	Recessive
Seed shape	 Round	 Wrinkled
Seed colour	 Yellow	 Green
Pod shape	 Inflated	 Constricted
Pod colour	 Green	 Yellow
Flower colour	 Violet	 White
Flower position	 Axial	 Terminal
Stem height	 Tall	 Dwarf

Figure 1. The seven pairs of contrasting characters Mendel studied in *Pisum sativum*.

4. Basic Genetic Terminology

Term	Meaning
Gene / Factor	A unit of heredity that controls a particular character; occupies a fixed position (locus) on a chromosome.
Allele	One of two or more alternative forms of a gene (e.g. T for tallness, t for dwarfness).
Genotype	The genetic (allelic) constitution of an organism, e.g. TT, Tt, or tt.
Phenotype	The observable physical/biochemical expression of the genotype, e.g. tall or dwarf.
Homozygous	Having two identical alleles for a gene (e.g. TT or tt); also called "pure" or "true-breeding."
Heterozygous	Having two different alleles for a gene (e.g. Tt); also called a "hybrid."
Dominant allele	The allele that expresses its effect in both homozygous and heterozygous states, masking the recessive allele (written in upper case, e.g. T).

Term	Meaning
Recessive allele	The allele that expresses its effect only in the homozygous state (written in lower case, e.g. t).
P generation	The parental generation used to start a genetic cross.
F1 generation	The first filial (hybrid) generation, produced by crossing two P-generation parents.
F2 generation	The second filial generation, produced by self- or inter-crossing the F1 individuals.
Punnett square	A grid diagram used to predict all possible genotypes of offspring from a given cross.
Test cross	A cross between an individual of unknown genotype (showing the dominant phenotype) and a homozygous recessive individual, used to determine the unknown genotype.
Back cross	A cross between an F1 hybrid and either of its parents (or a genetically similar individual).

5. Monohybrid Cross

A **monohybrid cross** is a genetic cross between two parents that differ in a **single** pair of contrasting traits. Mendel crossed a true-breeding tall pea plant (TT) with a true-breeding dwarf pea plant (tt).

5.1 Observations

- **P generation:** TT (tall) × tt (dwarf)
- **F1 generation:** All offspring were **Tt** and phenotypically **tall** — the dwarf trait disappeared completely, showing that tallness is dominant over dwarfness.
- **F2 generation** (produced by self-pollinating F1 plants): Approximately **3/4 tall** and **1/4 dwarf** plants reappeared, in a ratio of **3 : 1**. The recessive dwarf trait, though hidden in F1, was not lost — it reappeared unchanged in F2.

Monohybrid Cross: $Tt \times Tt$ (F1 Self-Cross)

Parents (F1): Tt (tall) $\times$ Tt (tall)

	T	t
T	TT Tall	Tt Tall
t	Tt Tall	tt Dwarf

Genotypic ratio 1 TT : 2 Tt : 1 tt

Phenotypic ratio 3 Tall : 1 Dwarf

Figure 2. Punnett square for the F1 self-cross ($Tt \times Tt$) showing the classic monohybrid F2 ratios.

Genotypic ratio in F2 = 1 TT : 2 Tt : 1 tt | Phenotypic ratio in F2 = 3 Tall : 1 Dwarf

6. Law of Dominance (Mendel's First Law)

Statement: When two homozygous individuals with contrasting/antagonistic traits are crossed, only one form of the trait appears in the F1 hybrid generation. This expressed trait is called **dominant**, and the suppressed, unexpressed trait is called **recessive**.

In the monohybrid cross above, tallness (T) is dominant over dwarfness (t): all F1 plants (genotype Tt) were tall, even though they carried one copy of the recessive dwarf allele.

7. Law of Segregation (Mendel's Second Law)

Also called the **Law of Purity of Gametes**. **Statement:** During gamete formation, the two alleles of a gene present in a heterozygous individual separate (segregate) from each other, so that each gamete receives only **one** allele of the pair, in its pure/unaltered form. The two alleles do not blend or contaminate each other in the heterozygote.

Law of Segregation: Alleles Separate During Gamete Formation

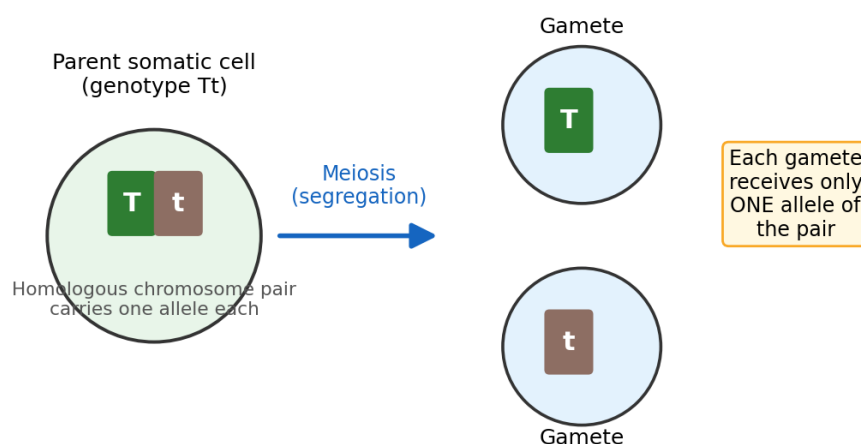


Figure 3. Alleles T and t , present together in a heterozygous (Tt) parent cell, segregate into separate gametes during meiosis.

This law explains why a recessive trait, though masked in the F_1 (Tt), reappears in the F_2 generation: half of the gametes produced by an F_1 plant carry T and half carry t , so random fertilisation regenerates all three genotypic combinations (TT , Tt , tt).

8. Test Cross and Back Cross

Because a dominant phenotype can arise from **either** a homozygous (TT) or heterozygous (Tt) genotype, a **test cross** is used to determine which genotype an individual actually has. The unknown individual is crossed with a homozygous recessive individual (tt).

- If the unknown parent is **homozygous (TT)**: all offspring will show the dominant phenotype (ratio = all Tt , i.e. 1:0).
- If the unknown parent is **heterozygous (Tt)**: offspring will appear in a **1 : 1** ratio of dominant : recessive phenotypes.

Test Cross: Tt (unknown/tall) $\times$ tt (homozygous recessive)

Used to determine whether a dominant phenotype is homozygous or heterozygous

	t	t
T	Tt	Tt
t	tt	tt

Result $1 Tt : 1 tt \rightarrow$ Tall : Dwarf = 1 : 1 $\Rightarrow$ parent was heterozygous (Tt)

Figure 4. A test cross ($Tt \times tt$) produces a 1:1 ratio, revealing that the tested parent is heterozygous.

A **back cross**, in the broader sense, is any cross of an F1 hybrid back to one of its parental genotypes (either the dominant or the recessive parent). A test cross is therefore a special type of back cross — specifically, a back cross to the **recessive** parent — used for the purpose of genotype determination.

9. Dihybrid Cross

A **dihybrid cross** studies the inheritance of **two** different genes/traits simultaneously. Mendel crossed a pea plant with round, yellow seeds (true-breeding, RRYy) with one having wrinkled, green seeds (true-breeding, rryy).

- **P generation:** RRYy (round, yellow) × rryy (wrinkled, green)
- **F1 generation:** All offspring were **RrYy** — round and yellow — showing that round seed shape and yellow seed colour are each dominant.
- **F2 generation (F1 × F1):** Four phenotypic classes appeared in the ratio **9 : 3 : 3 : 1** — round-yellow : round-green : wrinkled-yellow : wrinkled-green.

Dihybrid Cross: RrYy × RrYy (Round-Yellow × Round-Yellow)

Phenotypic ratio 9 Round-Yellow : 3 Round-Green : 3 Wrinkled-Yellow : 1 Wrinkled-Green

	RY	Ry	rY	ry
RY	RRYY RY	RRYy RY	RrYY RY	RrYy RY
Ry	RRYy RY	RRyy RG	RrYy RY	Rryy RG
rY	RrYY RY	RrYy RY	rrYY WY	rrYy WY
ry	RrYy RY	Rryy RG	rrYy WY	rryy WG

 RY = Round+Yellow (9)
 RG = Round+Green (3)
 WY = Wrinkled+Yellow (3)
 WG = Wrinkled+Green (1)

Figure 5. The 4×4 Punnett square for a dihybrid F1 self-cross (RrYy × RrYy), yielding the classic 9:3:3:1 phenotypic ratio.

Crucially, the F2 ratio shows that new trait **combinations** appeared that were not present in either P-generation parent (e.g. round-green and wrinkled-yellow seeds) — proving that the two genes for seed shape and seed colour are inherited **independently** of one another.

10. Law of Independent Assortment (Mendel's Third Law)

Statement: When two (or more) pairs of genes, located on different chromosome pairs, are considered together, the alleles of one gene segregate independently of the alleles of the other gene during gamete formation. Each pair of alleles behaves as an independent unit, so all possible combinations of alleles occur in the gametes with equal probability.

Important limitation: This law strictly holds true only for genes located on **different chromosomes**, or far apart on the same chromosome. Genes located close together on the same chromosome tend to be inherited together — a phenomenon called **linkage**, discovered later by Thomas Hunt Morgan, which is an exception to independent assortment.

11. Summary of Mendel's Three Laws

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In a heterozygote, one allele (dominant) masks the expression of the other (recessive) allele.

2. Law of Segregation

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3. Law of Independent Assortment

Alleles of different genes (on different chromosome pairs) assort into gametes independently of one another.

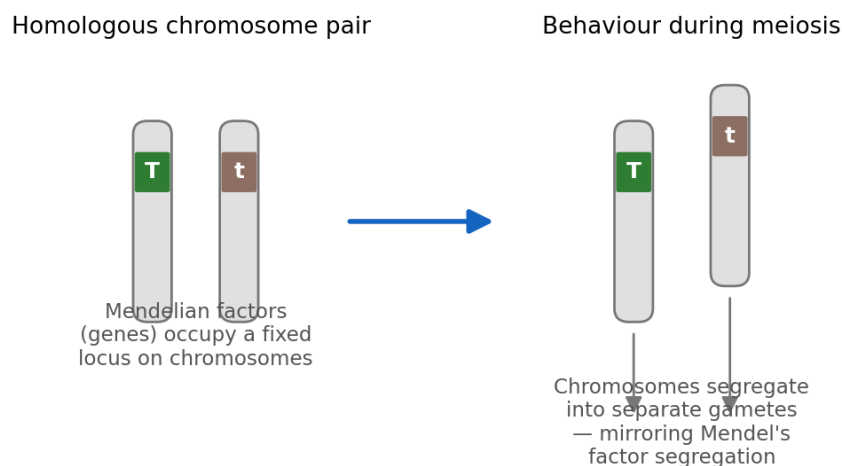
Figure 6. Mendel's three laws of inheritance at a glance.

12. Chromosomal Theory of Inheritance

Mendel's abstract "factors" remained a mathematical concept until the physical basis of heredity was understood. In 1902, **Walter Sutton** and **Theodor Boveri**, working independently, proposed the **Chromosomal Theory of Inheritance**, noting a striking parallel between the behaviour of Mendel's hereditary factors and that of chromosomes during meiosis:

- Chromosomes, like Mendelian factors, occur in **pairs** in somatic (body) cells, one inherited from each parent.
- During meiosis, homologous chromosome pairs **segregate** into different gametes — paralleling the Law of Segregation.
- Chromosome pairs on **different** chromosomes assort into gametes **independently** of one another — paralleling the Law of Independent Assortment.
- Each gamete receives only **one** chromosome from each homologous pair, restoring the diploid number upon fertilisation.

Chromosomal Theory of Inheritance (Sutton & Boveri, 1902)



Conclusion: Mendel's 'factors' (genes) are physically located on chromosomes

Figure 7. Genes occupy fixed loci on chromosomes; chromosome behaviour during meiosis explains Mendel's laws at the cellular level.

This theory unified cytology (the study of cells) with genetics, confirming that genes are physically carried on chromosomes, and is considered one of the pillars of classical genetics.

13. Reasons for Mendel's Success

Several earlier plant hybridists had performed similar crosses but failed to discover the underlying laws. Mendel's success is attributed to his experimental rigor:

- He used **true-breeding (pure) parental lines**, confirmed over several generations before beginning experiments.
- He studied **one or a few traits at a time** (monohybrid, then dihybrid crosses), rather than considering the whole organism at once.
- He chose traits showing **clear-cut, discontinuous** (either/or) variation rather than continuously varying traits.
- He grew **large numbers** of plants and counted offspring precisely, applying **quantitative, statistical analysis** to his results — an approach almost unknown among biologists of his era.
- He carefully controlled pollination through **artificial emasculation and hand-pollination**, ensuring the parentage of every cross was known with certainty.
- He performed **reciprocal crosses** (using each parental type as both the male and female parent) to confirm that results did not depend on which parent contributed which trait.

14. Exceptions to Mendelism (Non-Mendelian Inheritance)

Later research revealed several inheritance patterns that extend or deviate from Mendel's simple dominant/recessive model. These are not violations of the underlying laws of segregation and assortment, but reflect additional layers of complexity in how genes are expressed.

14.1 Incomplete Dominance

Neither allele is completely dominant; the heterozygote shows an **intermediate (blended)** phenotype distinct from both parents. Example: flower colour in snapdragon (*Antirrhinum majus*) and the "4 o'clock"

plant (*Mirabilis jalapa*) — red (RR) × white (rr) produces pink (Rr) offspring.

Incomplete Dominance in Snapdragon (*Antirrhinum majus*)

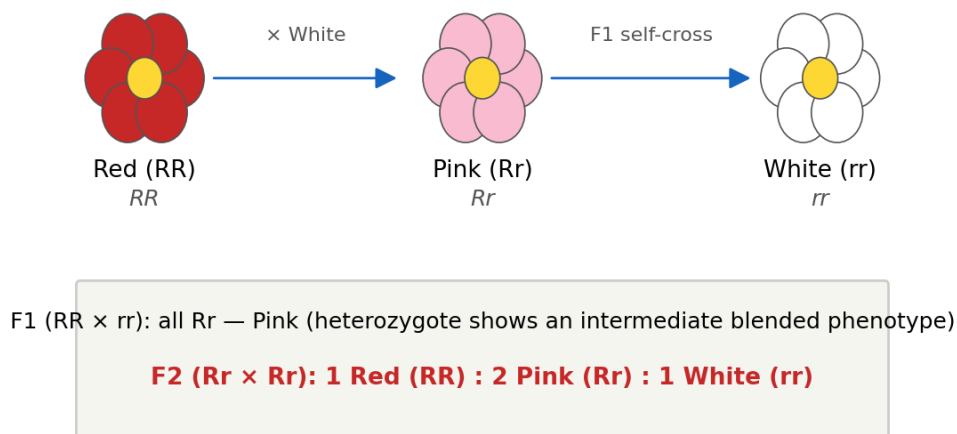


Figure 8. Incomplete dominance: the F1 heterozygote shows a blended, intermediate phenotype, and F2 shows a 1:2:1 phenotypic (= genotypic) ratio.

Note that in incomplete dominance, the phenotypic ratio in F2 (1 Red : 2 Pink : 1 White) exactly matches the genotypic ratio (1 RR : 2 Rr : 1 rr), unlike simple Mendelian dominance where the phenotypic ratio (3:1) differs from the genotypic ratio (1:2:1).

14.2 Co-dominance

Both alleles are fully and simultaneously expressed in the heterozygote, without blending. Example: roan coat colour in cattle, where red and white hairs both appear side-by-side; and the human **ABO blood group** system, where alleles I^A and I^B are co-dominant with each other (both expressed together in genotype $I^A I^B$, giving blood group AB).

Co-dominance: Coat Colour in Cattle

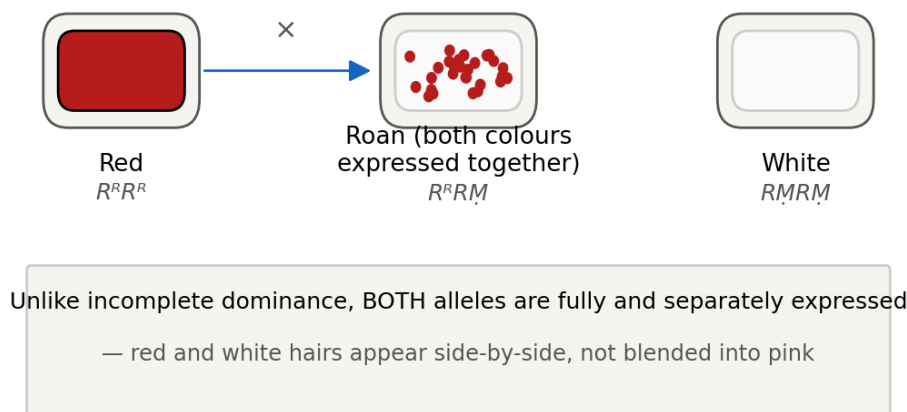


Figure 9. Co-dominance in cattle coat colour: the heterozygote expresses both parental colours simultaneously rather than blending them.

14.3 Multiple Alleles

Some genes exist in more than two allelic forms within a population, although any individual diploid organism carries only two of them. The classic example is the human **ABO blood group** system, controlled by three alleles: I^A , I^B , and i (where I^A and I^B are co-dominant, and both are dominant over i).

Genotype(s)	Blood Group (Phenotype)
$I^A I^A$ or $I^A i$	A
$I^B I^B$ or $I^B i$	B
$I^A I^B$	AB
ii	O

14.4 Lethal Alleles

Certain alleles, when present in the homozygous condition, cause the death of the organism before or shortly after birth, altering the expected Mendelian ratios. Example: the yellow coat colour allele (A^Y) in mice is dominant for coat colour but recessive lethal — $A^Y A^Y$ individuals die before birth. A cross between two yellow mice ($A^Y a \times A^Y a$) therefore produces surviving offspring in a **2 yellow : 1 non-yellow** ratio instead of the expected 3:1.

14.5 Pleiotropy

A single gene affects **multiple, apparently unrelated** phenotypic traits simultaneously. Example: the human sickle-cell allele affects red blood cell shape, causes anaemia and organ damage, but also confers partial resistance to malaria. Another example is phenylketonuria (PKU), where a single defective enzyme gene affects mental development, skin pigmentation, and hair colour.

14.6 Epistasis

The expression of one gene is masked or modified by one or more other, independently inherited genes (a gene-gene interaction, as opposed to dominance, which is an interaction between alleles of the **same** gene). Example: in Labrador retrievers, one gene (B/b) determines black versus brown pigment, while a separate gene (E/e) determines whether pigment is deposited in the coat at all — dogs with genotype ee are yellow/gold regardless of their B/b genotype, because the E gene is epistatic to the B gene.

14.7 Polygenic Inheritance

Some traits are controlled by **many genes** acting together (each with a small, additive effect) rather than by a single gene, producing **continuous** variation (a bell-curve distribution) rather than Mendel's discrete either/or classes. Examples in humans include skin colour, height, and body weight.

14.8 Mendelian vs Non-Mendelian Inheritance — Comparison

Feature	Mendelian Inheritance	Non-Mendelian Examples
Number of genes per trait	One	One (with modifiers) or many (polygenic)
Dominance	Complete (one allele fully masks the other)	Incomplete, co-dominant, or epistatic interactions
F2 phenotypic classes	Discrete (e.g. 3:1, 9:3:3:1)	Blended, additional classes, or skewed ratios
Variation pattern	Discontinuous (either/or)	Often continuous (e.g. height) or ratio-altered (lethal alleles)

15. Significance and Applications of Mendelism

- **Foundation of modern genetics:** Mendel's laws remain the conceptual starting point for understanding heredity, later unified with cytology (Chromosomal Theory) and molecular biology (DNA, genes as DNA sequences).
- **Plant and animal breeding:** Principles of dominant/recessive inheritance and predictable ratios underpin selective breeding, hybridisation, and hybrid vigour (heterosis) programmes used to improve crop yield, disease resistance, and livestock traits.
- **Human genetics and genetic counselling:** Many human disorders (e.g. albinism, cystic fibrosis, sickle-cell disease) follow simple Mendelian (autosomal dominant or recessive) inheritance patterns, allowing pedigree analysis and risk prediction for families.
- **Evolutionary biology:** Mendelian genetics, combined with Darwinian natural selection, gave rise to the "Modern Synthesis" of evolutionary theory in the 20th century.
- **Basis for further discovery:** Mendel's framework enabled later discoveries such as gene linkage, crossing over, mutation, and ultimately the structure and function of DNA.

16. Key Takeaways

- Mendelism is based on Mendel's pea-plant experiments (1856–1863), published in 1866 and rediscovered in 1900.
- Heredity is controlled by discrete, paired factors (genes/alleles), not by blending.
- **Law of Dominance:** one allele masks the other in a heterozygote.
- **Law of Segregation:** paired alleles separate into different gametes.
- **Law of Independent Assortment:** genes on different chromosomes assort independently.
- Monohybrid cross F2 ratio = 3:1 (phenotype), 1:2:1 (genotype).
- Dihybrid cross F2 ratio = 9:3:3:1.
- Test cross ($Tt \times tt$) reveals unknown genotypes via a 1:1 ratio.
- Exceptions — incomplete dominance, co-dominance, multiple alleles, lethal alleles, pleiotropy, epistasis, and polygenic inheritance — extend but do not invalidate Mendel's basic laws.
- The Chromosomal Theory of Inheritance (Sutton & Boveri, 1902) provided the physical, cellular basis for Mendel's abstract factors.

17. Practice Questions for Revision

A. Short Answer Questions

Q1. Define Mendelism and state who proposed it.

Ans: Mendelism refers to the principles of inheritance proposed by Gregor Johann Mendel based on his pea-plant hybridisation experiments (1856–1863).

Q2. Why is the garden pea considered an ideal experimental organism for genetic studies?

Ans: It is naturally self-pollinating (ensuring pure lines) yet easy to cross-pollinate artificially, has a short life cycle, is easy to grow, produces many offspring, and shows clear contrasting traits.

Q3. State the Law of Segregation.

Ans: The two alleles of a gene in a heterozygote separate from each other during gamete formation, so each gamete carries only one allele of the pair, in pure/unaltered form.

Q4. What phenotypic and genotypic ratios are obtained in the F₂ generation of a monohybrid cross?

Ans: Phenotypic ratio 3:1 (dominant:recessive); genotypic ratio 1:2:1 (homozygous dominant : heterozygous : homozygous recessive).

Q5. Differentiate between a test cross and a back cross.

Ans: A test cross is a cross of an individual of unknown genotype with a homozygous recessive individual, used specifically to reveal the unknown genotype. A back cross is any cross of an F₁ hybrid with either parental genotype; a test cross is therefore one particular type of back cross (to the recessive parent).

Q6. Why does the dihybrid F₂ ratio equal 9:3:3:1?

Ans: Because the two gene pairs assort independently, all four possible gamete types (RY, Ry, rY, ry) are produced in equal proportion by the F₁, and their random combination in a 4×4 Punnett square yields 9 parts showing both dominant traits, 3 parts each showing one dominant and one recessive trait, and 1 part showing both recessive traits.

Q7. Give one example each of incomplete dominance and co-dominance.

Ans: Incomplete dominance: flower colour in *Mirabilis jalapa*/snapdragon (red × white → pink). Co-dominance: roan coat colour in cattle, or the AB blood group in humans.

Q8. What is a lethal allele? Give an example.

Ans: An allele that causes death of the organism when present in the homozygous state. Example: the yellow coat colour allele (A^Y) in mice, where $A^Y A^Y$ is lethal, producing a 2:1 (instead of 3:1) ratio of surviving offspring.

Q9. State the Chromosomal Theory of Inheritance and name its proposers.

Ans: Proposed independently by Walter Sutton and Theodor Boveri (1902): Mendel's hereditary factors (genes) are located on chromosomes, and the behaviour of chromosomes during meiosis (pairing, segregation, independent assortment) parallels and explains Mendel's laws.

Q10. Why was Mendel's work overlooked for over 30 years?

Ans: Its mathematical/statistical approach was unfamiliar to contemporary biologists; the physical basis of heredity (chromosomes, meiosis) was not yet known; it was published in an obscure journal; and Karl Nägeli failed to recognise its importance.

B. Numerical / Punnett Square Problems

- In pea plants, tall (T) is dominant over dwarf (t). A tall plant of unknown genotype is crossed with a dwarf plant, and the offspring show a 1:1 ratio of tall to dwarf. What is the genotype of the tall parent? (*Answer: Tt, heterozygous — confirmed by the test cross result.*)
- In a dihybrid cross $RrYy \times RrYy$, what fraction of the F₂ offspring are expected to be homozygous recessive for both traits (rryy)? (*Answer: 1/16.*)
- Two pink-flowered (Rr) snapdragon plants are crossed. What phenotypic ratio is expected in the offspring? (*Answer: 1 Red : 2 Pink : 1 White.*)
- A man with blood group AB marries a woman with blood group O. What blood groups can their children have? (*Answer: Group A or Group B only, each with probability 1/2 — since the mother can only contribute allele i.*)

C. Multiple Choice Questions

1. Mendel's experiments were conducted mainly on:
(a) Drosophila (b) Garden pea (c) Maize (d) Guinea pig
2. The F₂ phenotypic ratio of a monohybrid cross is:
(a) 9:3:3:1 (b) 1:2:1 (c) 3:1 (d) 1:1
3. The scientists who independently rediscovered Mendel's laws in 1900 were:
(a) Watson, Crick, Wilkins (b) Sutton, Boveri, Morgan (c) de Vries, Correns, Tschermak (d) Darwin, Wallace, Lamarck
4. A cross between a heterozygote and a homozygous recessive individual is called a:
(a) Dihybrid cross (b) Reciprocal cross (c) Test cross (d) Monohybrid cross
5. Roan coat colour in cattle is an example of:
(a) Incomplete dominance (b) Co-dominance (c) Epistasis (d) Pleiotropy
6. The Chromosomal Theory of Inheritance was proposed by:
(a) Mendel and Darwin (b) Sutton and Boveri (c) Watson and Crick (d) Morgan and Muller

Answer key: 1-b 2-c 3-c 4-c 5-b 6-b

— End of Notes —