CLASS 10 SCIENCE NCERT SOLUTIONS

NCERT Solutions for Class 10 Science Chapter 8: Heredity – Free PDF Download

Chapter 8 of Class 10 Science covers Heredity -- how traits pass from parents to offspring. Under the 2023 curriculum rationalisation, the Evolution portion of the earlier combined "Heredity" chapter was removed from the CBSE syllabus, and the chapter was renumbered and retitled simply Heredity. The solutions below ...

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Why this chapter matters for boards

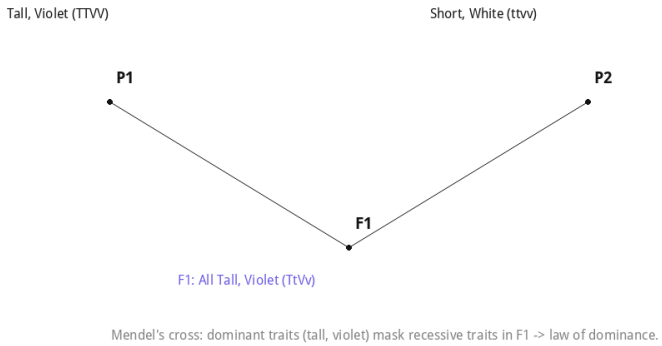
Heredity is a high-frequency topic for both objective (MCQ/assertion-reason) and short-answer board questions — monohybrid/dihybrid cross ratios, dominant/recessive traits, and the XX/XY sex-determination mechanism appear almost every year.

Textbook-style Exercise Solutions

Q1. If a trait A exists in 10% of a population of an asexually reproducing species and trait B exists in 60% of the same population, which trait likely arose earlier?
Answer: Trait B likely arose earlier. In an asexually reproducing population, a trait that has existed for a longer time has had more generations to spread and accumulate; a higher percentage generally indicates an older origin (assuming no unusual selection pressure against it).

Q2. How does the creation of variation in a species promote survival?
Answer: Variations arise during reproduction due to differences in DNA copying. Most are neutral, but some help individuals survive drastic environmental changes (for example, a variant bacterium that tolerates higher temperature survives a heat wave that kills the rest of the population). This lets the species survive changing conditions even though individuals without the helpful variation may die out.

Q3. In a cross between tall, violet-flowered pea plants and short, white-flowered pea plants, all F1 offspring were tall with violet flowers. What does this tell us about the inheritance of height and flower colour?



Mendel's cross: dominant traits (tall, violet) mask recessive traits in F1 -> law of dominance.

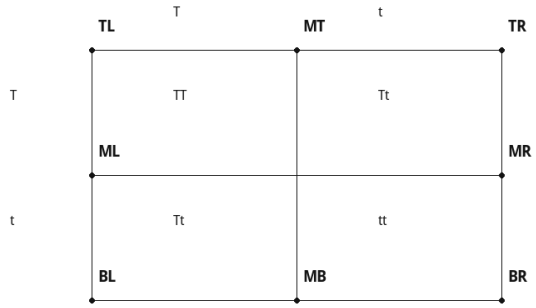
Answer: Tallness and violet colour are dominant traits (each fully expressed in F1). Because both dominant traits appeared together and the two traits segregate independently in later generations, the genes controlling height and flower colour are inherited independently of each other — Mendel’s Law of

Independent Assortment.

Q4. How is the sex of a child determined in human beings?
Answer: Humans have 23 pairs of chromosomes; one pair are the sex chromosomes. Every egg carries an X chromosome, but sperm carry either an X or a Y chromosome in equal proportion. If an X-carrying sperm fertilises the egg the child is female (XX); if a Y-carrying sperm fertilises the egg the child is male (XY). The father's sperm therefore determines the child's sex, with a natural probability close to 50:50.

Q5. A mother with blood group A and a father with blood group O have a child who could be either group A or group O. What does this depend on?
Answer: It depends on the mother's genotype. The I^A allele is dominant over i. If the mother is homozygous (I^AI^A), all children get an I^A allele and are group A. If heterozygous (I^Ai), she can pass either I^A or i; combined with the father's i allele (group O is ii), the child is A (I^Ai) or O (ii) with equal probability.

Q6. What is a monohybrid cross, and what phenotypic ratio does it produce in the F2 generation?



Monohybrid cross Tt × Tt: F2 ratio 3 Tall (TT, Tt, Tt) : 1 short (tt).

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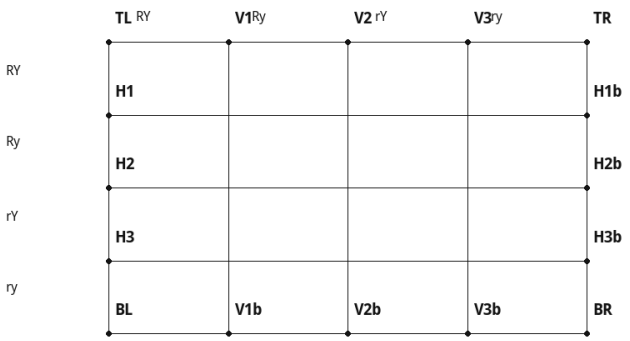
Answer: A monohybrid cross studies inheritance of a single trait (e.g. tall x short). Self-pollinating F1 (all tall, Tt) gives an F2 ratio of **3 tall : 1 short** (genotypic 1 TT : 2 Tt : 1 tt).

Q7. What phenotypic ratio does a dihybrid cross produce in F2, and why?



Dihybrid cross RrYy × RrYy: 4×4 Punnett square -> F2 phenotypic ratio 9:3:3:1.

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Answer: A dihybrid cross tracks two traits together (e.g. round-yellow x wrinkled-green seeds). The F2 ratio is **9:3:3:1**, because the two genes assort independently during gamete formation.

Q8. Why are traits acquired during an individual's lifetime (like a strong body built by exercise) generally not passed on to offspring?
Answer: Only changes in the DNA of germ cells (egg/sperm) are inherited. Acquired traits affect body cells (somatic cells) but not germ-cell DNA, so they are not transmitted to the next generation.

Q9. Give an example showing how a dominant trait can remain hidden in one generation and reappear in the next.
Answer: If both parents are heterozygous Tt (tall, since T is dominant), all are phenotypically tall, but the recessive short trait (tt) is hidden. Crossing two Tt parents can produce a short (tt) offspring in a 1-in-4 ratio, showing the recessive trait re-emerging after being masked.

Note on scope: some question numbers/wording in third-party solution sets for this chapter show minor inconsistencies after the 2023 rationalisation (which removed the Evolution section); the nine questions above cover the core, stable Heredity concepts confirmed across multiple current sources.

CBSE Exam Weightage

This chapter falls under **Unit II: World of Living** in the CBSE Class 10 Science board exam syllabus. This unit typically carries around **25 marks (31.25%)** of the 80-mark theory paper, based on CBSE's published unit-wise weightage (Question Paper Design). CBSE sets weightage at the unit level rather than chapter-by-chapter, so the exact share from this specific chapter can vary a little between years and sample papers.

Class 10 Science Chapter 8 – Notes and Extra Questions

Along with these NCERT Solutions, students can also use the Class 10 Science Chapter 8 Extra Questions and Class 10 Science Chapter 8 Revision Notes for quick revision and extra practice.