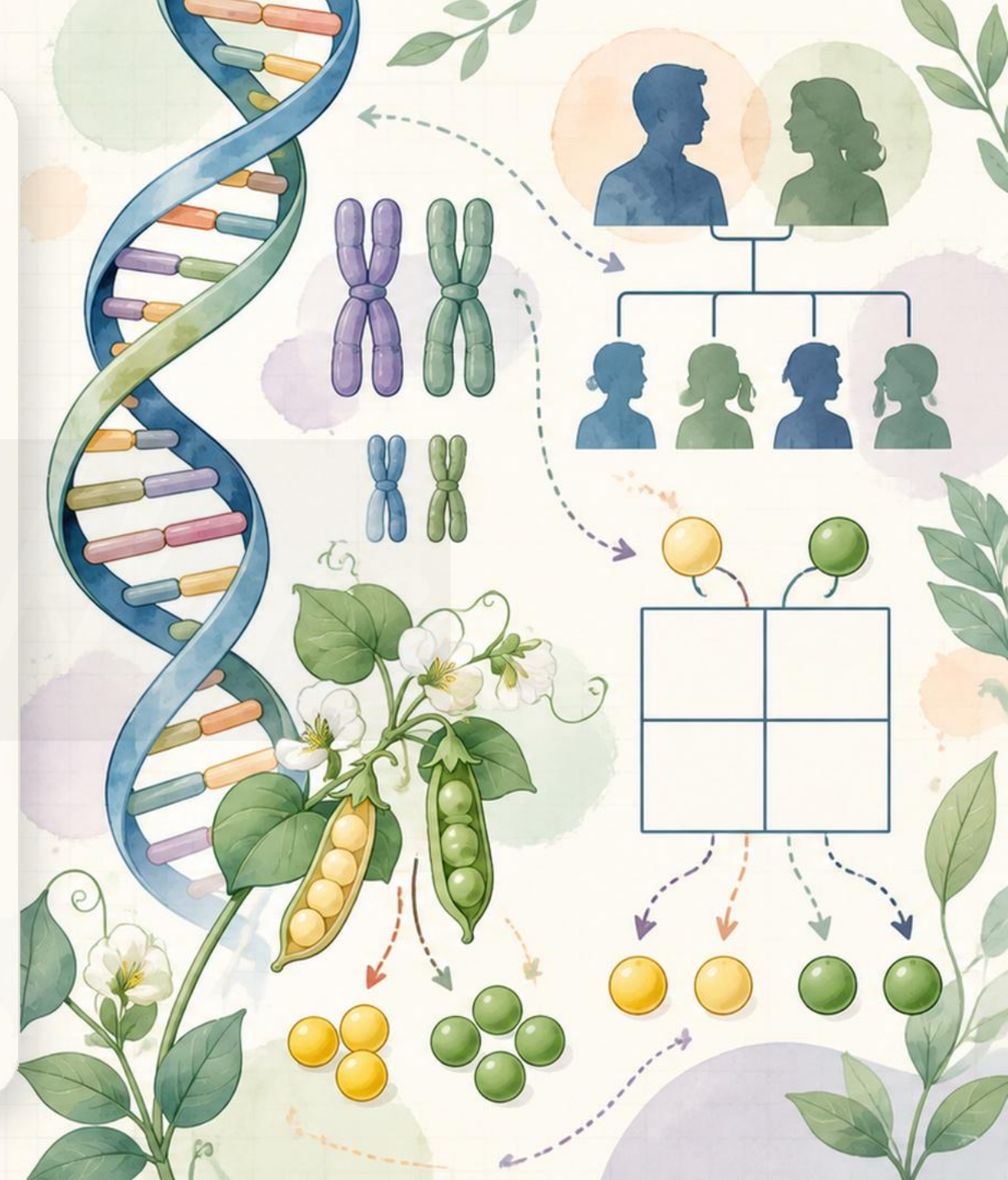


SCIENCE • CLASS 10

CHAPTER 8

Heredity

NCERT SOLUTIONS



GENOTYPE OF THE TALL PEA PARENT

Exercise 1 — A tall violet-flowered pea plant is crossed with a short white-flowered plant. All offspring have violet flowers, but almost half are short.

What is the tall parent's genotype?

- (a) TTWW (b) TTww (c) TtWW (d) TtWw

T = tall; t = short; W = violet; w = white

Half short offspring show that the tall parent is Tt.

All violet offspring indicate WW in this Mendelian cross.

Answer: (c) TtWW.

Parents: TtWW × ttww

Tall-parent gamete	Short-parent gamete	Offspring
TW	tw	TtWw (tall, violet)
tW	tw	ttWw (short, violet)

Expected ratio: 1 : 1

LIGHT EYE COLOUR AND DOMINANCE

Exercise 2 —

Children with light-coloured eyes are likely to have light-eyed parents. Can this show whether light eye colour is dominant or recessive? Why?

Answer: No, this observation alone is insufficient.

It shows a parent-child resemblance, but resemblance does not establish dominance.

Dominance describes which trait is expressed when different alleles occur together. We need more suitable inheritance information, including offspring of parents with contrasting traits.

Real human eye colour involves several genes, so a simple dominant-recessive model does not describe every case.

PROJECT ON DOG COAT COLOUR

Exercise 3 —

Outline a project to find the dominant coat colour in dogs.

Use existing pedigree records or a simulation, not breeding dogs for a school experiment.

1. Choose two contrasting coat colours and use a simple two-allele inheritance model.
2. Compare records of true-breeding parents with the contrasting colours and their first-generation offspring.
3. The colour expressed in all first-generation offspring is the dominant one under this model.
4. Check second-generation records: a ratio close to 3 : 1 supports simple dominance.

Actual dog coat colour may involve several genes; do not assume one colour is always dominant.



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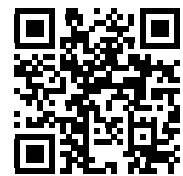


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