

17.4 Monohybrid inheritance

Name: _____ Class: _____ Date: _____

Total: 7 marks

KEY WORDS genotype 基因型 • inheritance 遗传 • phenotype 表现型 • heterozygous 杂合子
• recessive 隐性

Objective

Build the skills to answer exam questions on **monohybrid inheritance** 单基因遗传 — the key terms, **Punnett squares** 庞纳特方格, and ratios.

You must be able to:

- use genotype/phenotype, dominant/recessive, homo-/heterozygous
- complete a Punnett square and predict ratios
- interpret a test cross / pedigree

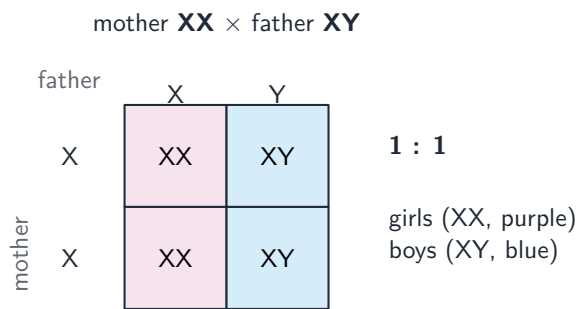
1 Worked examples

■ A monohybrid cross

Bb × Bb (both parents)

gametes	B	b	
B	BB	Bb	3 : 1 3 dominant (blue) 1 recessive (orange)
b	Bb	bb	

$Bb \times Bb \rightarrow BB, Bb, Bb, bb \rightarrow$ a 3:1 ratio of dominant to recessive



A Punnett square also predicts sex determination

- **dominant** shows with one copy (capital); **recessive** needs two copies (lower-case).
- **homozygous** = two same alleles; **heterozygous** = two different.

2 Practice

2.1 Define a recessive allele. [1]

2.2 State the genotype of a heterozygous organism for a gene with alleles B and b. [1]

3 Exam-style questions

3.1 Crossing two heterozygous parents (Bb × Bb) gives a phenotype ratio of: [1]

A	B
C	D

A 1:1

B 3:1

C 1:2:1

D all dominant

3.2 In rabbits, black fur (B) is dominant to white (b). A heterozygous black rabbit is crossed with a white rabbit.

(a) Complete a Punnett square for this cross. [3]

(b) State the ratio of black to white offspring expected. [1]
