

Inheritance · supported focus

Supported focus · HL

Supported scope

- Supported HL focus. First assessment 2025; current subject brief acquired; full Biology guide not acquired. Remaining guide, assessment and practical requirements retain their recorded holds.
- State model conditions and distinguish fictional data from measurements.

Inheritance · 1.1

Reasoning

Two parents can carry a recessive allele without expressing the associated phenotype. Their children do not have to match the parents phenotypically. Start with a prediction. State the quantities or features you would compare, then decide what evidence could distinguish two explanations.

Inheritance · 2.1

Reasoning

An allele is a variant of a gene. A genotype lists alleles; a phenotype is the expressed characteristic, influenced by genotype and sometimes environment. Dominant and recessive describe the relationship between alleles, not how common they are. allele: A variant of a gene; genotype: The alleles an organism carries.

Inheritance · 3.1

Reasoning

In a simple monohybrid cross $Aa \times Aa$, gametes carry A or a. Combining independent gametes gives AA, Aa, Aa and aa. The predicted probabilities describe many possible fertilizations, not a fixed order of children. Write parental genotypes and gametes before making the grid. State the inheritance model and phenotype key. Use a pedigree to check consistency with a model; do not infer certainty from a small family alone.

Inheritance · 4.1

Reasoning

State the known values and their units. Choose the relation because its assumptions fit this case, then rearrange before substitution. Known: $Aa \times Aa$ with complete dominance. Probability of $aa = 1/4 = 25\%$. Probability of the dominant phenotype = $3/4 = 75\%$. If four children are born, there is no guarantee that exactly one has the recessive phenotype.

Inheritance · 4.2

Reasoning

In $Aa \times aa$, what percentage of offspring are predicted to be aa ? Use the same sequence: known quantities $\rightarrow$ model $\rightarrow$ relation $\rightarrow$ substitution $\rightarrow$ unit and interpretation.

Inheritance · 5.1

Reasoning

A dominant allele can be rare. Mutation is a source of new variation; selection changes the relative success of existing variants rather than directing mutations toward a goal. Return to the original observation. Explain what the result supports, which conditions it assumes, and one way to test a competing explanation.

Inheritance · 5.2

Reasoning

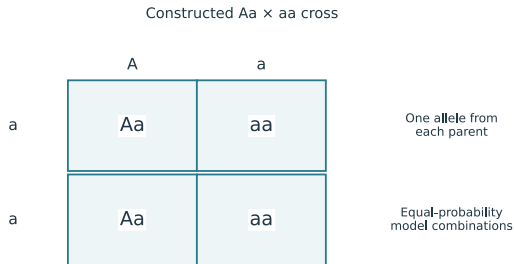
A dominant allele must be the most common allele in a population. This claim is false: A dominant allele can be rare. Mutation is a source of new variation; selection changes the relative success of existing variants rather than directing mutations toward a goal.

Inheritance · 5.3

Reasoning

Inheritance, variation and probability: In a simple monohybrid cross $Aa \times Aa$, gametes carry A or a. Combining independent gametes gives AA, Aa, Aa and aa. The predicted probabilities describe many possible fertilizations, not a fixed order of children.

Inheritance · diagram



Boxes show possible outcomes, not a fixed sequence of births.

- Original teaching diagram: Inheritance, variation and probability
- Use the labels and the stated model together.

Inheritance · original transfer

Your turn

For $Aa \times aa$ under complete dominance, find the probability that two independently conceived offspring both have the recessive phenotype. Does a family of two have to match the ratio?

Inheritance · transfer reasoning

Method and interpretation

$(1/2)^2=1/4$. Mendelian probabilities describe repeated independent outcomes; a family need not contain one child of each phenotype. State complete dominance and independence.

Check yourself

- Explain allele using the stated model.
- Explain genotype using the stated model.
- Change one value in the original transfer; explain which assumption still matters.