

Inheritance

Why does a diploid cell have two copies of each autosomal gene?

Inheritance

P, F1 and F2 generations

Inheritance

Why can pea plants self-fertilize?

Inheritance

Gene versus allele

Inheritance

Phenotype

Inheritance

Why is an allele recessive?

Inheritance

Phenotypic plasticity

Inheritance

Cause of phenylketonuria (PKU)

P: pure-breeding parents crossed. F1: their offspring. F2: offspring of F1 crossed together or self-pollinated.

It formed when two haploid gametes, one from each parent and each carrying one copy, fused into a zygote.

A gene is a heritable factor at a locus influencing a characteristic; an allele is one alternative form of a gene.

They produce both male gametes (in pollen) and female gametes (in ovules) on the same plant, so self-pollination is possible.

It usually codes for a non-functional protein, so its effect only shows when no dominant (functional) allele is present.

The observable traits of an organism, resulting from genotype and environmental factors.

A recessive allele of an autosomal gene for the enzyme that converts phenylalanine to tyrosine.

Capacity to develop traits suited to the environment by varying patterns of gene expression; not a change in genotype; may be reversible.

Inheritance

Single-nucleotide polymorphism (SNP)

Inheritance

How many alleles of a gene can an individual inherit?

Inheritance

ABO alleles and dominance

Inheritance

Codominance example

Inheritance

Incomplete dominance example

Inheritance

What determines sex in humans?

Inheritance

Why are X-linked traits more common in males?

Inheritance

Genotype of a haemophilia carrier

Only two, although any number of alleles can exist in the gene pool.

A base position where the nucleotide differs between individuals; SNPs create multiple alleles in a gene pool.

Blood group AB ($I^A I^B$): heterozygote has a dual phenotype with both A and B antigens.

I^A and I^B are codominant; both are dominant to i .

The sex chromosome in the sperm: X gives XX (female-typical), Y gives XY (male-typical).

Mirabilis jalapa (four o'clock flower): red $\times$ white gives pink, an intermediate heterozygote.

$X^H X^h$: a heterozygous female, unaffected but able to pass X^h to children.

The X carries far more genes than the Y, and males have one X, so a single recessive X-linked allele is expressed.

Inheritance Pedigree clue for a recessive allele	Inheritance Genetic basis for prohibiting marriage between close relatives
Inheritance Inductive versus deductive reasoning in pedigrees	Inheritance Continuous variation
Inheritance Discrete variable example	Inheritance Six aspects shown by a box-and-whisker plot
Inheritance HL only Independent assortment	Inheritance HL only Dihybrid ratios for unlinked genes

Relatives are more likely to carry the same rare recessive allele, so children are more likely to be homozygous recessive.

Two unaffected parents have an affected child.

A trait can take any value in a range, due to polygenic inheritance and/or environment, e.g. skin colour.

Inductive: deducing a general pattern from some cases. Deductive: using that pattern to work out specific individuals' genotypes.

Outliers, minimum, first quartile, median, third quartile, maximum.

ABO blood group: distinct categories with no intermediates.

$AaBb \times AaBb$ gives 9:3:3:1. $AaBb \times aabb$ (test cross) gives 1:1:1:1.

Alleles of unlinked genes go into gametes in all combinations equally, because bivalents orient randomly at metaphase I.

Inheritance **HL only**

Locus

Inheritance **HL only**

Why do linked genes fail to assort independently?

Inheritance **HL only**

Recombinant

Inheritance **HL only**

Chi-squared formula and decision rule

Inheritance **HL only**

Degrees of freedom for a dihybrid chi-squared test

Their loci are on the same chromosome, so alleles travel together into gametes unless crossing over separates them.

The position of a gene on a particular chromosome, e.g. HBB (beta-globin) on chromosome 11.

$\chi^2 = \Sigma(O - E)^2/E$. If $\chi^2 >$ critical value at $p = 0.05$, reject the null hypothesis.

An individual or gamete with a combination of alleles not on either parental chromosome, produced by crossing over (or independent assortment).

Number of classes – 1 = 3; critical value at $p = 0.05$ is 7.815.