

Edexcel (A) Biology A-level

2.12 to 2.14 - Inheritance

Flashcards

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What is a mutation?



What is a mutation?

An alteration to the DNA base sequence.
Often arise spontaneously during DNA replication.



Define the three types of mutation.



Define the three types of mutation.

- Substitution = replacing a base with another.
- Addition = inserting a base.
- Deletion = removing a base.



Give an example of a disorder that arises from a mutation.



Give an example of a disorder that arises from a mutation.

Cystic fibrosis. Affects the protein that makes mucus watery, resulting in very thick and sticky mucus.



How is functioning impaired in people with cystic fibrosis?



How is functioning impaired in people with cystic fibrosis?

- Respiratory= mucus in lungs reduces surface area for gas exchange and traps harmful bacteria.
- Digestive= nutrients not properly absorbed due to thick mucus covering intestine lining.
- Reproductive= mucus prevents sperm from reaching egg (in women) and blocks the sperm duct (in men).



Define genotype.



Define genotype.

The genetic constitution of an organism.



Define phenotype.



Define phenotype.

The expression of an organism's genetic constitution, combined with its interaction with the environment.



What is an allele?



What is an allele?

Different forms of a particular gene, found at the same locus (position) on a chromosome. A single gene could have many alleles.



What is meant by a dominant allele?



What is meant by a dominant allele?

An allele whose characteristic will always appear in the phenotype, whether one or two are present.



What is meant by a recessive allele?



What is meant by a recessive allele?

An allele whose characteristic only appears in the phenotype if no dominant allele is present, meaning two must be present.



What is meant by incomplete dominance?



What is meant by incomplete dominance?

An allele whose characteristic is not completely expressed over its paired recessive allele. The result is a phenotype that is a combination of the two alleles.



What is meant by homozygous and heterozygous?



What is meant by homozygous and heterozygous?

Homozygous = both alleles are dominant, or both alleles are recessive.

Heterozygous = one allele is dominant, the other is recessive.



Define monohybrid inheritance.



Define monohybrid inheritance.

Where one phenotypic characteristic is controlled by a single gene.



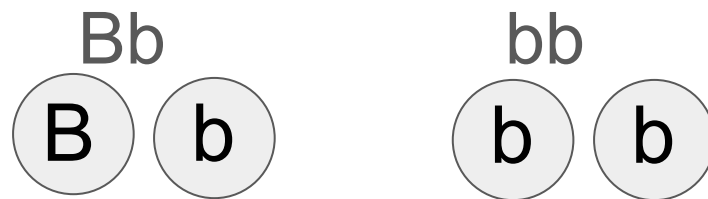
Draw an example of a genetic cross diagram for monohybrid inheritance.



Draw an example of a genetic cross diagram for monohybrid inheritance.

Parental phenotypes Brown eyes Blue eyes

Parental genotypes



Gametes

Offspring genotypes
(draw a punnet square)

Bb, Bb, bb, bb

Offspring phenotypes 2:2 brown eyes:blue eyes



Draw an example of a pedigree diagram for monohybrid inheritance.



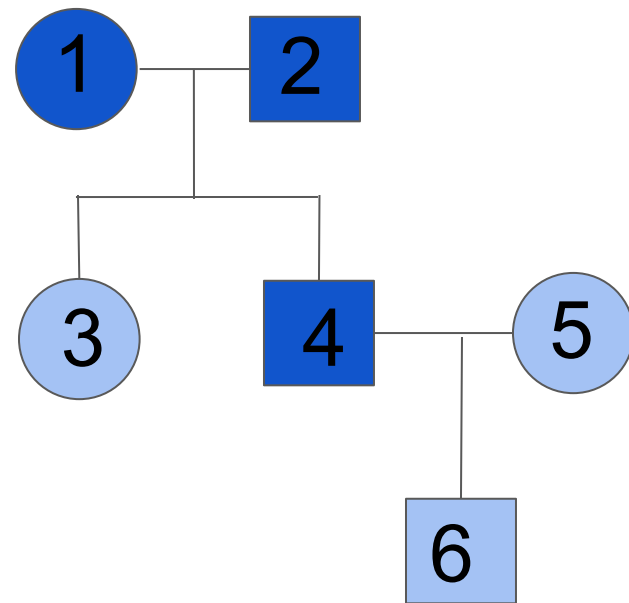
Draw an example of a pedigree diagram for monohybrid inheritance.

 Unaffected female

 Unaffected male

 Affected female

 Affected male



What does the pedigree diagram from the previous question tell us about the genotypes of 1, 2 and 4?



What does the pedigree diagram from the previous question tell us about the genotypes of 1, 2 and 4?

Since 1, 2 and 4 are all unaffected but produced an affected child, they must be carriers. Therefore we can tell they have the heterozygous genotype.

