OCR (B) Biology GCSE

Topic B1.2: How is genetic information inherited?

Flashcards

What are gametes?

What are gametes?

Reproductive cells (e.g. egg and sperm cells) that contain a single copy of each chromosome

Describe sexual reproduction in terms of chromosome number

Describe sexual reproduction in terms of chromosome number

- Two gametes with a single copy of each chromosome fuse
- Resulting embryo has two chromosomes for each gene and two copies of each allele

Define homozygous

Define homozygous

Having two identical alleles of a gene

e.g. FF or ff

Define heterozygous

Define heterozygous

Having two different alleles of a gene

e.g. Ff

What is a dominant allele?

What is a dominant allele?

Describes an allele that is always expressed

Represented with a capital letter e.g. F

What is a recessive allele?

What is a recessive allele?

An allele that is only expressed in the absence of a dominant allele

Represented with a small letter e.g. f

A female who is homozygous recessive for cystic fibrosis (ff) has a child with a heterozygous male (Ff). Draw a punnett square to illustrate this single gene inheritance.

A female who is homozygous recessive for cystic fibrosis (ff) has a child with a heterozygous male (Ff). Draw a punnett square to illustrate this single gene inheritance.

		Female genotype	
		f	f
Male genotype	F	Ff	Ff
	f	ff	ff

PKU is a recessive condition. Two heterozygous parents have offspring. Predict the proportion of offspring that will have PKU.

PKU is a recessive condition. Two heterozygous parents have offspring. Using a punnett square, predict the proportion of offspring that will have PKU.

75% chance of normal phenotype

25% chance of PKU phenotype

		Female genotype	
		P	p
Male genotype	P	PP	Pp
	p	Pp	pp

What is the problem with single gene crosses?

What is the problem with single gene crosses?

Most characteristics are controlled by multiple alleles rather than just one

What are sex chromosomes?

What are sex chromosomes?

A pair of chromosomes that determines sex:

- Males have an X and a Y chromosome
- Females have two X chromosomes

Why does the inheritance of a Y chromosome mean that an embryo develops into a male?

Why does the inheritance of a Y chromosome mean that an embryo develops into a male?

Testes development in an embryo is stimulated by a gene present on the Y chromosome

A couple have a child. Using a punnett square, determine the probability of having offspring that is female.

A couple have a child. Using a punnett square, determine the probability of having offspring that is female.

50% chance of female (XX)

		Female genotype	
		X	X
Male genotype	X	XX	XX
	Y	XY	XY

Other than using a punnett square, how else can single gene inheritance be represented?

Other than using a punnett square, how else can single gene inheritance be represented?

Using a family tree

Outline how the work of Mendel helped scientists to develop their understanding of genetics (biology only)

Outline how the work of Mendel helped scientists to develop their understanding of genetics (biology only)

- Mendel studied the inheritance of different phenotypes of pea plants
- He established a correlation between parent and offspring phenotypes
- He noted that inheritance was determined by ‘units’ passed on to descendants
- Using gene crosses, he devised the terms ‘dominant’ and ‘recessive’

What is genome sequencing?
(biology only/higher)

What is genome sequencing? (biology only/higher)

Finding out the order of nucleotides in the DNA of an organism, enabling the function and interaction of genes to be assessed

Why is genome sequencing important?
(biology only/higher)

Why is genome sequencing important? (biology only/higher)

- Allows the comparison of genomes of healthy individuals with patients who have a disease
- Potential disease-causing alleles are identified
- Individuals can then undergo genetic testing for these alleles