

Chromosomes, genes and proteins

What are chromosomes made of?

Chromosomes, genes and proteins

Define a gene.

Chromosomes, genes and proteins

Define an allele.

Chromosomes, genes and proteins

Which sex chromosomes do females and males have?

Chromosomes, genes and proteins

What decides the sex of a baby?

Chromosomes, genes and proteins **Supplement**

What does the sequence of bases in a gene determine?

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Why do different amino acid sequences give different proteins?

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How does DNA control cell function?

A length of DNA that codes for a protein.

DNA, which contains genetic information in the form of genes.

Females have XX. Males have XY.

An alternative form of a gene.

The sequence of amino acids used to make a specific protein.

Whether the sperm that fertilises the egg carries an X or a Y chromosome.

By controlling the production of proteins, such as enzymes, membrane carriers and receptors for neurotransmitters.

Different sequences fold into different shapes.

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What is mRNA?

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What does a ribosome do in protein production?

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Why do different body cells make different proteins if they have the same genes?

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What is a haploid nucleus?

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What is a diploid nucleus?

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How many pairs of chromosomes are in a human diploid cell?

Mitosis and meiosis **Supplement**

Define mitosis.

Mitosis and meiosis **Supplement**

State the roles of mitosis.

The mRNA passes through it and it assembles amino acids into a protein molecule.

Messenger RNA: a copy of a gene, made in the nucleus, that moves to the cytoplasm.

A nucleus containing a single set of chromosomes.

Many genes are not expressed. The cell only makes the specific proteins it needs.

23 pairs (46 chromosomes in total).

A nucleus containing two sets of chromosomes.

Growth, repair of damaged tissues, replacement of cells and asexual reproduction.

Nuclear division giving rise to genetically identical cells.

Mitosis and meiosis **Supplement**

What happens to the chromosomes before mitosis?

Mitosis and meiosis **Supplement**

What happens to the copies of chromosomes during mitosis?

Mitosis and meiosis **Supplement**

What is a stem cell?

Mitosis and meiosis **Supplement**

What is meiosis involved in producing?

Mitosis and meiosis **Supplement**

Describe meiosis.

Mitosis and meiosis **Supplement**

What happens to the daughter cells made when a stem cell divides?

Monohybrid inheritance

Define inheritance.

Monohybrid inheritance

Define genotype.

They separate, so each daughter cell has the same chromosome number as the parent cell.

They are replicated exactly (copied).

Gametes.

An unspecialised cell that divides by mitosis to produce daughter cells that can become specialised for specific functions.

Some stay as stem cells. Others become specialised for specific functions.

A reduction division in which the chromosome number is halved from diploid to haploid, resulting in genetically different cells.

The genetic make-up of an organism, in terms of the alleles present.

The transmission of genetic information from generation to generation.

Monohybrid inheritance

Define phenotype.

Monohybrid inheritance

What is the difference between homozygous and heterozygous?

Monohybrid inheritance

Which individuals are pure-breeding?

Monohybrid inheritance

Define a dominant allele.

Monohybrid inheritance

Define a recessive allele.

Monohybrid inheritance

What phenotypic ratio does $Tt \times Tt$ give?

Monohybrid inheritance

What phenotypic ratio does $Tt \times tt$ give?

Monohybrid inheritance

Pedigree: two unaffected parents have an affected child. What does this tell you?

Homozygous: two identical alleles of a gene (TT, tt). Heterozygous: two different alleles (Tt).

The observable features of an organism.

An allele that is expressed if it is present in the genotype.

Two identical homozygous individuals that breed together are pure-breeding. A heterozygous individual is not pure-breeding.

3 dominant : 1 recessive (1 TT : 2 Tt : 1 tt).

An allele that is only expressed when there is no dominant allele of the gene present in the genotype.

The characteristic is recessive and both parents are heterozygous carriers.

1 dominant : 1 recessive.

Monohybrid inheritance

What does a Punnett square show?

Monohybrid inheritance **Supplement**

What is a test cross?

Monohybrid inheritance **Supplement**

A test cross gives some recessive offspring. What is the unknown parent?

Monohybrid inheritance **Supplement**

Define codominance.

Monohybrid inheritance **Supplement**

Which genotypes give blood group A?

Monohybrid inheritance **Supplement**

What genotype gives blood group AB?

Monohybrid inheritance **Supplement**

What is a sex-linked characteristic?

Monohybrid inheritance **Supplement**

Why is red-green colour blindness more common in males?

Crossing an organism of unknown genotype with a homozygous recessive one to identify the unknown genotype.

The possible gametes from each parent and the genotypes of the offspring they can make.

A situation in which both alleles in heterozygous organisms contribute to the phenotype.

Heterozygous, because it must have passed on a recessive allele.

$I^A I^B$, because I^A and I^B are codominant.

$I^A I^A$ or $I^A I^o$.

Males have one X chromosome, so one recessive allele is enough. Females need two.

A feature in which the gene responsible is located on a sex chromosome, which makes it more common in one sex than in the other.

Monohybrid inheritance **Supplement**

What genotype is a carrier female for colour blindness?

Monohybrid inheritance **Supplement**

**Carrier mother × normal father:
chance a son is colour blind?**

1 in 2 (50%).

XB Xb.