Edexcel Biology IGCSE

3.b - Inheritance

Flashcards

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What is the genome?

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What is the genome?

All of the genes present in an organism.

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What is a gamete?

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What is a gamete?

Gametes are sex cells (sperm or eggs).

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What is a chromosome?

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What is a chromosome?

Tightly packaged DNA around histone proteins.

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How many chromosomes do human body cells have?

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How many chromosomes do human body cells have?

46 chromosomes (23 pairs)

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How many chromosomes do human gametes have?

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How many chromosomes do human gametes have?

23 chromosomes

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Where are chromosomes located?

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Where are chromosomes located?

In the nucleus of the cell

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What is a gene?

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What is a gene?

A section of DNA that codes for a protein.

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Describe the structure of DNA (Higher)

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Describe the structure of DNA (Higher)

- It is a polymer made of many nucleotide monomers
- It is made of 2 strands in the shape of a double helix

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Name the 4 bases in DNA (Higher)

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Name the 4 bases in DNA (Higher)

Adenine (A), Thymine (T), Cytosine (C) and Guanine (G)

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State 2 differences between DNA and RNA?

(Higher)

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State 2 differences between DNA and RNA? (Higher)

- DNA is double stranded whereas RNA is single stranded
- RNA contains Uracil (U) whereas DNA contains Thymine (T)

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How do the bases in DNA pair up? (Higher)

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How do the bases in DNA pair up (Higher)

Adenine pairs with Thymine (A with T)

Cytosine pairs with Guanine (C with G)

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Describe transcription (Higher)

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Describe transcription (Higher)

1) DNA unzipped
2) Complementary mRNA nucleotides bind and are joined together
3) mRNA detaches and leaves the nucleus

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What is a codon? (Higher)

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What is a codon? (Higher)

A group of 3 bases on the mRNA molecule that code for a single amino acid.

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What is an anticodon? (Higher)

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What is an anticodon? (Higher)

3 bases on a tRNA molecule that match the codon on the mRNA molecule

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Describe translation (Higher)

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Describe translation (Higher)

1) mRNA travels to a ribosome
2) tRNA molecules with an anticodon that matches the codon on the mRNA molecule carry amino acids to the ribosome
3) The amino acids are joined together

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How does the sequence of bases affect the protein made in protein synthesis? (Higher)

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How does the sequence of bases affect the protein made in protein synthesis? (Higher)

DNA is a triplet code where 3 bases code for one amino acid and the order of amino acids determine the protein produced.

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What is an allele?

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What is an allele?

Different versions of the same gene

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What is a dominant allele?

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What is a dominant allele?

A version of a gene where only one copy is needed for it to be expressed.

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What is a recessive allele?

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What is a recessive allele?

A version of a gene where two copies are needed for it to be expressed

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What is meant when an organism is homozygous?

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What is meant when an organism is homozygous?

When an organism has two copies of the same allele (two recessive or two dominant).

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What is meant when an organism is heterozygous?

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What is meant when an organism is heterozygous?

When an organism has two different versions of the same gene (one dominant and one recessive).

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What is the genotype?

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What is the genotype?

The genes present for a trait

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What is the phenotype?

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What is the phenotype?

The visible characteristic

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What is codominance? (Higher)

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What is codominance? (Higher)

When two alleles affect the phenotype

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What is monohybrid inheritance?

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What is monohybrid inheritance?

The inheritance of one allele

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Draw a Punnett square for a cross between a homozygous recessive blue eyed female (bb) with a heterozygous brown eyed male (Bb)

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Draw a Punnett square for a cross between a homozygous recessive blue eyed female (bb) with a heterozygous brown eyed male (Bb)

	B	b
b	Bb	bb
b	Bb	bb

50% brown eyes	Bb
50% blue eyes	bb

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Draw a Punnett square for a cross between a homozygous dominant red flower (RR) with a homozygous recessive white flower (rr)

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Draw a Punnett square for a cross between a homozygous dominant red flower (RR) with a homozygous recessive white flower (rr)

	R	R
r	Rr	Rr
r	Rr	Rr

100% Red flowers	Rr

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Draw a Punnett square for a cross between two heterozygous cystic fibrosis carriers (Ff)

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Draw a Punnett square for a cross between two heterozygous cystic fibrosis carriers (Ff)

	F	f
F	FF	Ff
f	Ff	ff

25% healthy	FF
50% carriers	Ff
25% have CF	ff

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Draw a Punnett square to show how sex is determined

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Draw a Punnett square to show how sex is determined

	X	X
X	XX	XX
Y	XY	XY

50% Male	XY
50% Female	XX

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What do family pedigrees show?

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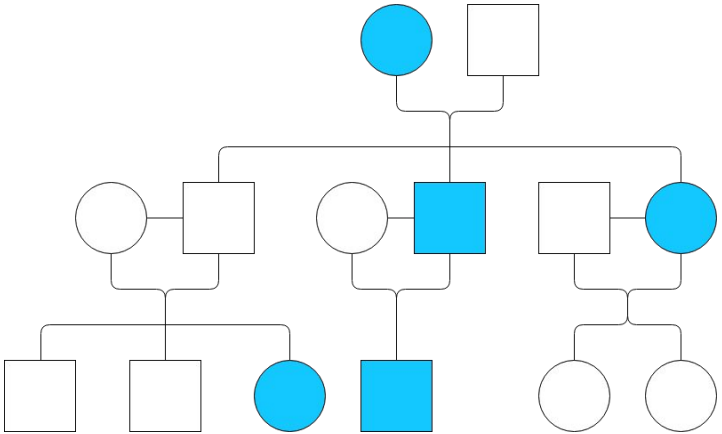
What do family pedigrees show?

The inheritance of an allele over generations



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Give 3 processes that require mitosis

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Give 3 processes that require mitosis

- Growth
- Repair
- Asexual reproduction

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How many cells does mitosis produce?

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How many cells does mitosis produce?

One parent cell produces two daughter cells.

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How many cells does meiosis produce?

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How many cells does meiosis produce?

One parent cell produces 4 daughter cells.

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Give 2 differences between mitosis and meiosis

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Give 2 differences between mitosis and meiosis

- Mitosis produces 2 genetically identical cells whereas meiosis produces 4 genetically different cells
- Mitosis produces diploid cells whereas meiosis produces haploid cells

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What is random fertilisation?

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What is random fertilisation?

- The random chance of a specific sperm combining with a specific egg
- This increases variation as any female can mate with any male and any one of the millions of sperm could fertilise the egg

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What are the two types of variation?

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What are the two types of variation?

Genetic variation and environmental variation

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State 2 traits in humans caused only by genetic variation

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State 2 traits in humans caused only by genetic variation

- Eye colour
- Blood type

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State 2 traits in humans caused by a mix of environmental and genetic variation

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State 2 traits in humans caused by a mix of environmental and genetic variation

- Height
- Weight

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What is a mutation?

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What is a mutation?

A random change in the genetic material of an organism.

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How do mutations alter the phenotype? (Higher)

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How do mutations alter the phenotype? (Higher)

- Mutations alter the genetic material (DNA)
- This can cause it to code for a different sequence of amino acids
- A different sequence of amino acids means that the protein will be different

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Give 3 environmental factors that can increase the chance of mutations (Higher)

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Give 3 environmental factors that can increase the chance of mutations (Higher)

- Exposure to UV radiation
- Exposure to X-rays
- Certain chemicals, particularly those found in cigarette smoke

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Describe the process of natural selection

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Describe the process of natural selection

- Populations are naturally varied due to random genetic mutations
- Some of these mutations provide a selective advantage
- These organisms survive and reproduce, passing on the successful genes

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Define evolution

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Define evolution

Evolution is a change in the genetic makeup of a population over time due to natural selection.

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Describe how antibiotic resistance arises

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Describe how antibiotic resistance arises

- A random genetic mutation causes a bacterium to become resistant to the antibiotic
- When the antibiotic is used, all the bacteria that do not have the mutation are killed
- The population containing just the resistant bacteria then begins to grow

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What are the risks of antibiotic resistance?

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What are the risks of antibiotic resistance?

Bacteria that cause infections that are resistant to antibiotics are hard to treat and can pose a serious threat to our health.

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