AP BIO INSTA-REVIEW

TOPIC 5.2

Meiosis and Genetic Diversity

IST-1.H.1

Separation of the homologous chromosomes in meiosis I ensures that each gamete receives a haploid (1n) set of chromosomes that comprises both maternal and paternal chromosomes.

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Meiosis and Genetic Diversity

IST-1.H.2

During meiosis I, homologous chromatids exchange genetic material via a process called "crossing over" (recombination), which increases genetic diversity among the resultant gametes.

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Meiosis and Genetic Diversity

IST-1.H.3

Sexual reproduction in eukaryotes involving gamete formation—including crossing over, the random assortment of chromosomes during meiosis, and subsequent fertilization of gametes—serves to increase variation.

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What moves apart during anaphase I of meiosis I?

A. Homologous chromosomes

B. Sister chromatids

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What moves apart during anaphase I of meiosis I?

A. Homologous chromosomes

Meiosis I involves homologous chromosomes. During anaphase I, the homologous chromosomes that aligned on the metaphase plate during metaphase I are segregating to opposite poles.

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What moves apart during anaphase II of meiosis II?

A. Homologous chromosomes

B. Sister chromatids

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What moves apart during anaphase II of meiosis II?

B. Sister chromatids

Meiosis II involves sister chromatids. Anaphase II separates the sister chromatids that were aligned on the metaphase plate during metaphase II.

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When does crossing over take place?

A. Metaphase I

B. Metaphase II

C. Prophase I

D. Prophase II

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When does crossing over take place?

C. Prophase I

Crossing over involves non-sister chromatids exchanging genetic information. This occurs during prophase I when the homologous chromosomes pair up forming a tetrad and crossing over forms the chiasmata.

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How does crossing over affect linked traits?

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How does crossing over affect linked traits?

Crossing over involves exchanging genetic material between nonsister chromatids.

During crossing over, the linked traits could be separated leading to being inherited independently.

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What is the significance of crossing over?

A. Decreases amount of DNA

B. Decreases genetic variation

C. Increases amount of DNA

D. Increases genetic variation

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TOPIC 5.2

What is the significance of crossing over?

D. Increases genetic variation

Crossing over involves exchanging genetic information between non-sister chromatids. The resulting chromosome is a new combination of genes from the homologous chromosomes called a recombinant chromosome.

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What is the ploidy after homologous chromosomes separate?

A. Haploid

B. Diploid

C. Triploid

D. Tetraploid

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TOPIC 5.2

What is the ploidy after homologous chromosomes separate?

A. Haploid

Since the homologous chromosomes are TWO sets of chromosomes (maternal and paternal set).

After anaphase I (when the homologous chromosomes separate), the cell is now HAPLOID.

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Why is the cell haploid after homologous chromosomes separate?

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Why is the cell haploid after homologous chromosomes separate?

Haploid involves having one set of chromosomes while diploid involves having two sets of chromosomes.

Homologous chromosomes are a set of maternal and a set of paternal chromosomes. So, if you separate the maternal and paternal set ... you only have one set.

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What processes increases genetic variation?

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TOPIC 5.2

What processes increases genetic variation?

> Mutations

> Independent Assortment

> Crossing over

> Random fertilization

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What are homologous chromosomes?

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TOPIC 5.2

What are homologous chromosomes?

Chromosome pairs that are the same length and similar banding patterns. One is maternally donated and the other is paternally donated.

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TOPIC 5.2

What process caused the daughter cells to be haploid?

A. Anaphase I/Telophase I

B. Anaphase II/Telophase II

C. Crossing over

D. Independent assortment

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TOPIC 5.2

What process caused the daughter cells to be haploid?

A. Anaphase I/Telophase I

During anaphase I, the homologous chromosomes are segregating to opposite poles. This results in ONE set of chromosomes, so the daughter cell is HAPLOID. Crossing over will jsut exchange genetic information and Independent Assortment involves the homologous chromosomes lining up on the metaphase plate. These increase genetic diversity but do not reduce the chromosome number.

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What is crossing over?

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What is crossing over?

Nonsister chromatids exchange genetic materials during prophase I.

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TOPIC 5.2

Which of the following does not lead to genetic variation?

A. Crossing over

B. Independent Assortment

C. Random fertilization

D. All of the above lead to genetic variation

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TOPIC 5.2

Which of the following does not lead to genetic variation?

D. All of the above lead to genetic variation
(Crossing over, Independent Assortment, Random fertilization)

Crossing over exchanges genetic information between two chromosomes leading to a recombinant chromosome (new combination of genes on ONE chromosome)

Independent assortment leads to the gametes resulting in either maternal or paternal for each chromosome.

Random fertilization involves any sperm fusing with any egg which leads to variance.