

Biology Test: Cell Division (Mitosis and Meiosis)

Section A: Multiple Choice

Shade the letter of the correct answer.

10. In meiosis, sister chromatids separate during:

- a) Anaphase II
- b) Metaphase II
- c) Anaphase I
- d) Telophase I

11. Which statement best distinguishes meiosis from mitosis?

- a) Meiosis occurs in body cells only and produces 2 diploid daughter cells
- b) Meiosis produces genetically identical cells that are diploid
- c) Meiosis involves two nuclear divisions and produces 4 different haploid daughter cells
- d) Meiosis does not involve chromosomes

12. Which process ensures variation in inherited characteristics?

- a) Mitosis
- b) Meiosis
- c) Cytokinesis
- d) Growth

13. An organism that reproduces asexually produces offspring that:

- a) Are genetically identical to the parent
- b) Have half the chromosome number
- c) Are genetically varied
- d) Always mutate

14. The transmission of inheritable genetic characteristics occurs through:

- a) Mitosis in body cells
- b) Meiosis and fertilisation
- c) Growth and repair
- d) Cytokinesis

15. Which cell division process is responsible for maintaining chromosome number across generations?

- a) Mitosis only
- b) Meiosis only
- c) Fertilisation only
- d) Meiosis and fertilisation

16. During which stage of meiosis does crossing over occur?

- a) Prophase I
- b) Metaphase I
- c) Anaphase I
- d) Prophase II

17. Which of the following are NOT natural examples of asexual reproduction?

- a) binary fission in bacteria and amoeba
- b) vegetative propagation in plants i.e. stolons and runners
- c) cloning in identical twins
- d) tissue culture and grafting

18. Which event occurs in Meiosis II but not in Meiosis I?

- a) Separation of homologous chromosomes
- b) Pairing of homologous chromosomes
- c) Separation of sister chromatids
- d) Crossing over

19. The halving of chromosome number during meiosis is important because it:

- a) Increases growth
- b) Prevents mutation
- c) Maintains chromosome number after fertilisation
- d) Produces identical offspring

20. Which of the following is a correct comparison between mitosis and meiosis?

- a) Both produce genetically identical cells
- b) Mitosis involves two nuclear divisions while meiosis involves only one
- c) Meiosis produces haploid cells while mitosis produces diploid cells
- d) Meiosis is used for growth and repair while mitosis is used for asexual reproduction

21. Which feature distinguishes meiosis from mitosis?

a) DNA replication occurs	b) Cytokinesis occurs
c) Homologous chromosomes pair up in meiosis	d) Sister chromatids separate

22. The role of meiosis in the transmission of inheritable characteristics is to:

a) Repair damaged DNA	b) Ensure offspring are identical
c) Produce gametes with genetic variation	d) Increase the size of organisms

23. Genetic variation resulting from meiosis is mainly due to:

- a) Mitosis
- b) Fertilisation only
- c) Crossing over and independent assortment in metaphase I and II
- d) Cytokinesis

24. Which process links meiosis to the maintenance of chromosome number in a species?

- a) Growth
- b) Asexual reproduction
- c) Fertilisation
- d) Tissue repair

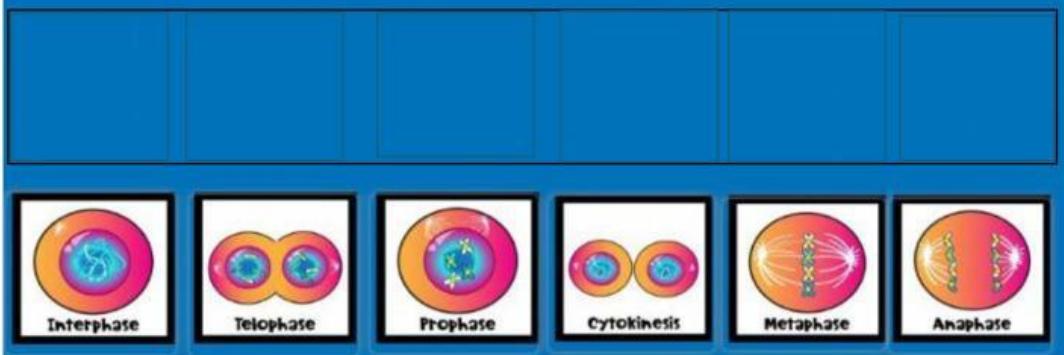
25. Which statement best explains why sexual reproduction produces variation?

- a) Offspring are produced by mitosis only
- b) Gametes are genetically identical
- c) Meiosis produces genetically different gametes
- d) Chromosome number remains constant

Section B: Structured Questions

The Cell Cycle & PMAT

Put the pictures in order.



What happens during Cell Cycle & PMAT?

Match the correct phase to the activity.

Interphase

Chromosomes condense and the nucleus is still visible

Prophase

90% of cells time spent for cell growth, DNA replication, and cell normal functions.

Metaphase

Chromosomes move to opposite sides of the cell by spindle fibers

Anaphase

Cytoplasm is split into two identical cells.

Telophase

Nucleus forms around each set of chromosomes

Cytokinesis

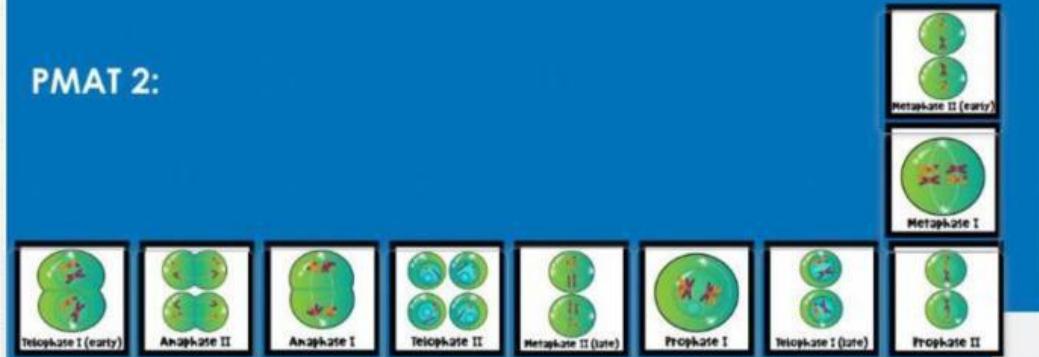
Nucleus is gone, spindle fibers form and chromosomes line up in the middle.

Meiosis Stages

Put the pictures in order.

PMAT I:

PMAT 2:



What happens during PMAT I and II?

Match the descriptions to the phases of Meiosis by drawing lines to their descriptions.

Chromosome pairs line up in the middle.

Prophase I

Chromosomes (with sister chromatids attached) pull away to opposite poles of the cell.

Nuclei reform forming 2 daughter cells.

Metaphase I

Nuclear membranes form around four unique cells.

Sister chromatids are pulled apart and Independent assortment occurs.

Anaphase I

DNA condense, homologous pairs made, Crossing over occurs in this phase, spindle fibers form.

Chromosomes line up single file in the middle of the cells.

Telophase I

The 2 cells from PMAT I begin to condense their chromosomes. Spindle fibers form.

Let's Compare Mitosis & Meiosis

	Mitosis	Meiosis		
Type of cell it occurs in				
Function of cell produced				
# of divisions (PMAT)				
Number of chromosome in daughter cells(humans)				
Type of daughter cells produced				
Are chromosomes exchanged or do they remain identical?				
new cells are used for repair & growth ends with 2 identical cells	ends with 23 chromosomes ends with 46 chromosomes new cells are used for reproduction	PMAT occurs twice occurs in somatic (body) cells ends with 4 genetically different cells	identical copies of chromosomes are made PMAT occurs once	"crossing over" occurs in this process occurs in sperm and egg cells