9

Student: _____

1. Two chromatids are connected by a

A. centromere
B. spindle
C. centriole
D. chromosome

2. Fibers extending from cell pole to cell pole are called the

A. cleavage furrow.
B. cell plate
C. cell equator
D. spindle

3. An organelle found in animals and involved in cell division is the

A. lysosome
B. mitochondrion
C. Golgi apparatus
D. centriole

4. During prophase _____ are formed.

A. nucleoli
B. new chromosomes
C. spindles
D. centromeres

5. Chromosomes align along the equator during

A. metaphase
B. anaphase
C. telophase.
D. prophase

6. In a human, the 46 chromosomes would be at the equator during

A. interphase
B. prophase
C. anaphase
D. metaphase

7. Daughter cells are formed during

A. metaphase.
B. anaphase
C. prophase
D. telophase

8. Chromosomes move toward the poles during

A. metaphase
B. telophase
C. anaphase
D. interphase

9. Chromosomes first become visible during

A. telophase
B. prophase.
C. anaphase
D. metaphase

10. When the chromosomes have moved around so that they all lie on a plane in the middle of the cell, the stage is called

A. anaphase.
B. metaphase
C. prophase
D. telophase

11. The stage during which chromosomes shorten by condensing their nucleoprotein is called

A. anaphase
B. metaphase
C. prophase.
D. telophase

12. In what mitotic stage does the cytoplasm divide?

A. prophase
B. metaphase
C. anaphase
D. telophase

13. Which of the following is NOT true concerning mitosis?

A. It insures the immortality of the genetic information possessed by an organism
B. The DNA molecule replicates before any chromosomes can be seen
C. It is the process that heals a wound
D. It accounts for most of the increase in size of growing plants and animals.

14. The most important result of mitosis is the

A. production of new varieties of cells to meet changes in the environment
B. exact duplication of the parent cell's genetic information
C. equal division of the parent cell's genetic information between the two daughter cells
D. equal distribution of the parent's cytoplasm between the two daughter cells

15. During prophase of mitosis, the

A. nucleus is preparing for the beginning stage of mitosis that will follow
B. chromosomes are so loosely coiled and stretched out that they are not yet visible
C. nucleoli and nuclear membrane disappear
D. zygote is formed.

16. The metaphase stage of mitosis is characterized by the

A. arrangement of chromosomes along a line
B. arrangement of chromosomes on a plane
C. division of the centromeres.
D. duplication of genetic information

17. Which of the following does NOT distinguish mitosis in plant cells from mitosis in animal cells?

A. production of a cell plate
B. production of a furrow
C. presence of centrioles
D. presence of centromeres

18. During anaphase of mitosis, the

A. nuclear membranes begin to reappear around each of the patches that will soon be daughter nuclei.
B. number of distinct chromosomes present is twice the number that were present before mitosis started
C. centromeres have not divided
D. chromosomes replicate by making exact copies of themselves.

19. During telophase of mitosis the

A. chromosomes have ended their move toward the poles
B. daughter cells separate themselves from each other
C. DNA of the chromosomes duplicates in preparation for the cell division.
D. cell's genetic characteristics modify to meet any change in the environment

20. After cell division, some cells become differentiated. This means that they

A. become different shapes
B. become different sizes
C. perform different functions
D. become different in all these ways

21. The time it takes for cells to divide

A. varies, but it takes sophisticated equipment to measure this small difference.
B. depends on the health and environment of the cell
C. does not vary at all, but is controlled by an internal clock
D. varies widely and unpredictably in cells of the same local area of the same organism during any specific time period

22. The order in which the stages of mitosis proceed is

A. anaphase, interphase, metaphase, prophase, telophase
B. interphase, anaphase, metaphase, prophase, telophase
C. prophase, metaphase, anaphase, telophase, interphase
D. interphase, telophase, prophase, anaphase, metaphase

23. _____ is not part of interphase

A. Gap 1
B. Gap 2
C. Cytokinesis
D. DNA synthesis

24. DNA replication occurs during

A. prophase of mitosis
B. metaphase of mitosis.
C. gap 1 of interphase
D. S phase of interphase

25. Centromeres are

A. composed of microtubules
B. two identical sides of a metaphase chromosome
C. regions that attach chromosomes
D. the structures that contain genetic material.

26. Which of the following is NOT true of cytokinesis?

A. Cytokinesis is the division of cytoplasm and its contents
B. The formation of a cell plate in plants results in cytokinesis
C. The formation of a cleavage furrow in animals results in cytokinesis
D. Cytokinesis occurs during interphase

27. ____ is NOT an event of telophase.

A. Uncoiling of chromosomes
B. Disappearance of spindle
C. Nuclear membranes forming to create daughter nuclei
D. Breaking down of nucleoli

28. A cell that contains eight chromosomes and is undergoing mitosis will produce ____ daughter cell(s); each daughter cell will contain ____ chromosomes.

A. two; eight
B. two; four
C. four; four
D. one; eight

29. Chromosomes are composed of two chromatids during

A. gap 1.
B. telophase.
C. metaphase
D. anaphase.

30. The process of cell specialization within a multicellular organism is

A. cancer.
B. cytokinesis
C. mitosis.
D. determination

31. In which of the following stages of the cell cycle would you find chromosomes separated into individual chromatids?

A. prophase
B. metaphase
C. telophase
D. cytokinesis

32. The normal outcome of mitosis is

A. to make cells smaller
B. to produce genetically identical copies of cells
C. to reduce the amount of DNA in daughter cells
D. differentiation.

33. In which of the following stages of the cell cycle does the cell contain chromosomes consisting of 2 chromatids joined by a centromere?

A. anaphase
B. metaphase
C. cytokinesis
D. telophase

34. Which of the following is typical of interphase?

A. DNA replicates
B. The chromosomes get short and thick
C. The nucleolus disappears
D. The cell does nothing.

35. A dividing cell lacks a nuclear membrane, contains chromosomes consisting of two chromatids, and has clearly visible chromosomes. In which one of the following stages?

A. metaphase
B. anaphase
C. interphase
D. telophase

36. "I can tell this cell is in metaphase because ."..

A. the chromatids are dividing.
B. the spindle is being formed.
C. the chromosomes are aligned on the equator of the cell.
D. the nuclear membrane is forming.

37. _____ may cause cancer.

A. Chemotherapeutic agents
B. Mutagenic agents
C. Meiosis
D. Cytokinesis

38. Cells spend most of their life

A. in the G_0 phase.
B. dividing.
C. in metaphase.
D. undergoing differentiation.

39. DNA is synthesized in which stage of the typical cell cycle?

A. prophase
B. G_1
C. S
D. G_2

40. The whole point of mitosis is to

A. be sure that DNA is replicated
B. reproduce the parent cell into genetically identical daughter cells
C. reproduce the parent cell into similar but not identical daughter cells.
D. produce sex cells (gametes)

41. Which of the following techniques would be useful in controlling cancer once it has formed an abnormal growth?

A. Prevent mutations from occurring in the cancer cells.
B. Treat the cancer with drugs or other therapies that selectively kill dividing cells.
C. Increase the mutation rate to kill the cancer cells.
D. Increase the rate of mitosis in the cancer cells.

42. During which of the following stages of the cell cycle does DNA replication take place?

A. prophase
B. interphase
C. telophase
D. anaphase

43. Controlled cell death is termed

A. apoptosis
B. metastasis
C. malignancy.
D. tumor formation.

44. Tumors that are harmful, non-encapsulated growths of cells are known as

A. benign.
B. malignant.
C. metastasized.
D. carcinogenic.

45. The physician explained that her cancer had metastasized o

A. spread from its original site.
B. shrunk in size.
C. become benign.
D. stopped growing.

46. A normally functioning muscle cell is in which stage of its cycle?

A. G_2
B. anaphase
C. G_0
D. cytokinesis

47. Proteins required for the spindles are synthesized in the

A. G_2 stage.
B. S stage.
C. G_0 stage.

D. G_1 stage

48. Radiation most likely destroys cancer cells by inducing a process called

A. cytokinesis
B. protein disintegration
C. differentiation.
D. apoptosis

49. When the gene p53 initiates apoptosis, the cell's DNA causes the cell to

A. enter prophase
B. spontaneously break down the cell membrane
C. become differentiated
D. digest itself from the inside out.

50. A cell mass that does NOT fragment and spread beyond its original area of growth is known as a(n)

A. benign tumor.
B. atumoron
C. malignant tumor.
D. nodule

51. The _____ on the chromosome is where the spindle fibers bind to the chromosome and is responsible for the shortening of fibers during anaphase

A. chromatin
B. centromere
C. tubulin
D. kinetochore

52. Homologous chromosomes separate during

A. metaphase
B. anaphase
C. anaphase I.
D. anaphase II

53. This is the type of cell division used by most prokaryotes.

A. mitosis
B. binary fission
C. binary fusion
D. meiosis

54. In meiosis, centromeres split in

A. telophase I.
B. anaphase I.
C. telophase II
D. anaphase II.

55. Crossing-over occurs in

A. prophase I.
B. prophase II
C. metaphase II.
D. Both prophase I and II

56. The exchange of chromosome parts may occur during

A. telophase II
B. anaphase II
C. prophase I.
D. metaphase II

57. When homologous chromosomes are at the equator of the cell, it is in

A. telophase
B. metaphase I.
C. metaphase II.
D. Any of these stages

58. Cytokinesis may occur during

A. prophase I.
B. metaphase I.
C. anaphase I
D. telophase I.

59. The spindle begins to form in

A. telophase I.
B. prophase I

C. interphase
D. telophase II.

60. Two nuclei are formed during

A. prophase I.
B. metaphase I.
C. anaphase I
D. telophase I.

61. Chromosomes first become visible during

A. prophase I.
B. metaphase I
C. anaphase I
D. telophase I.

62. Chromosomes move toward the poles during

A. anaphase II.
B. metaphase II.
C. prophase II
D. telophase II

63. The centromere divides during

A. metaphase II
B. telophase II
C. anaphase II.
D. prophase II

64. Spindles disappear during

A. prophase I.
B. telophase II
C. anaphase II
D. metaphase I.

65. During metaphase I of meiosis,

A. individual chromosomes line up at the poles
B. homologous pairs are aligned at the equator.
C. pairs of chromosomes separate from other pairs by spindle rays.
D. only one member of each pair is in each cell

66. During anaphase II of meiosis,

A. the centrioles form.
B. daughter cells form.
C. chromosomes move to poles
D. chromatids exchange parts

67. During which stage does cytokinesis happen?

A. prophase I
B. anaphase
C. telophase I
D. metaphase I

68. Independent assortment refers to the fact that

A. a cell will divide and produce various offspring regardless of whether any other cell is dividing
B. mitosis normally produces cells that are like each other and like parent cell
C. the daughter cell that receives the maternal #1 chromosome will not necessarily receive the maternal #2.
D. a crossover between two chromosomes will produce offspring unlike either parent

69. Segregation

A. happens whenever a cell is fertilized.
B. happens when chromosomes separate and move to the poles.
C. is the separation between daughter cells after cell division
D. None of these answers define segregation.

70. Equivalent segments of DNA are exchanged between chromosomes as a result of

A. segregation
B. crossing-over.
C. fertilization
D. independent assortment.

71. The separation of homologous chromosomes is called

A. synapsis.
B. segregation.

C. mitosis.
D. fertilization.

72. Sometimes the gene for blue eye color is in the same gamete as the gene for curly hair, but they are in different gametes just as often. Why?

A. crossing-over
B. independent assortment
C. fertilization
D. segregation

73. Normally, a gamete gets only one of a pair of alleles. This is true because of

A. crossing-over.
B. independent assortment
C. fertilization
D. segregation.

74. Crossing-over results in

A. chromosome duplication.
B. new combinations of genes
C. point mutations
D. All of these answers are true.

75. Segregation refers to the separation of

A. linked genes from each other
B. alleles.
C. dominant genes from the rest of the chromosome.
D. assorted structures in the cell

76. If the blood type and the number of fingers are inherited independently, this means

A. they are on the same chromosome.
B. they are linked to each other.
C. they segregate randomly.
D. B blood and six fingers are rare.

77. Nondisjunction is the process

A. in which homologous chromosomes fail to segregate normally.
B. in which abnormal cytokinesis occurs.
C. in which metaphase is not allowed to occur.
D. described by two of these statements.

78. Nondisjunction results in

A. two small daughter cells that disappear and two normal-sized cells
B. two polar bodies.
C. daughter cells with different numbers of chromosomes
D. two cells with equal numbers of chromosomes.

79. Nondisjunction may result in a person with twenty-three pairs of chromosomes

A. plus an extra chromosome.
B. minus a sex chromosome.
C. with an extra chromosome number 21
D. All of these answers are true.

80. If segregation does NOT occur, the result will be

A. crossing-over.
B. independent assortment
C. nondisjunction.
D. fertilization

81. An excess number of chromosomes in a gamete results fro

A. mutation.
B. nondisjunction.
C. crossing-over.
D. fertilization

82. The process of cell specialization within a multicellular organism i

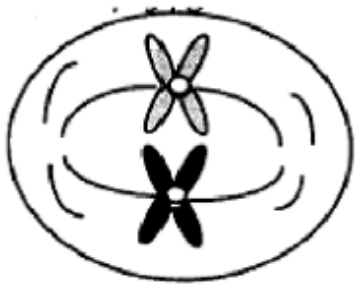
A. cancer.
B. cytokinesis
C. mitosis.
D. determination.

83.

The cell below isn

A. prophase.
B. telophase
C. anaphase
D. metaphase.

84. The cell below is in



A. prophase
B. telophase
C. anaphase.
D. metaphase

85. Two genes that are located in close proximity to one another on the same chromosome are said to be

A. mutated
B. linked
C. grouped
D. homologous

86. Synapsis is the

A. exchange of genetic material between homologous chromosomes.
B. condition in which homologous chromosomes pair and lie close to each other
C. independent assortment of homologous chromosomes
D. separation and movement of homologous chromosomes to the poles

87. The sex organ in plants that produces the male gamete is called the

A. pistil.
B. autosome
C. anther
D. testes

88. ____ does not contribute to genetic variety.

A. Independent assortment
B. Cytokinesis
C. Sexual reproduction
D. Crossing-over

89. Which of the following is **false** regarding nondisjunction?

A. Nondisjunction results in sex cells having too few or too many chromosomes.
B. The frequency of nondisjunction increases in women over the age of 37.
C. Nondisjunction is a cause of Down syndrome.
D. A cell with one too few chromosomes is trisomic

90. If the haploid number of an organism is 6, the diploid number will be

A. 3.
B. 6.
C. 9
D. 12

91. If the haploid number for an organism is 20, the number of chromosomes in each gamete will be

A. 5.
B. 10
C. 20
D. 40.

92. Chromosome number reduces during

A. mitosis
B. interphase
C. meiosis I

D. meiosis II.

93. Chromatids separate and move toward opposite poles during

A. mitosis only.
B. meiosis I and meiosis II.
C. mitosis and meiosis II.
D. mitosis, and meiosis I and meiosis II.

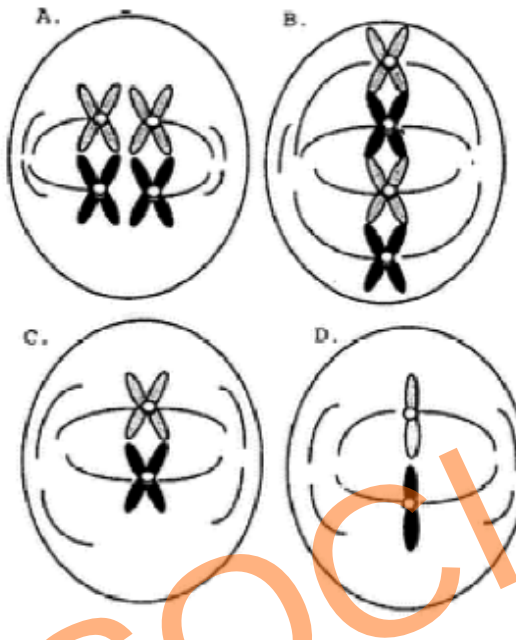
94. A pair of chromosomes that contain alleles for the same genes at the same locations are

A. haploid
B. homologous
C. homozygous
D. synapsed.

95. Crossing-over and synapsis occur during

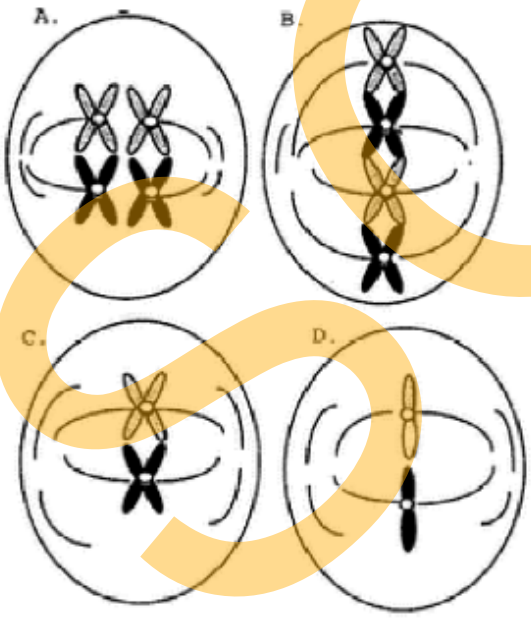
A. prophase of mitosis only.
B. prophase I of meiosis only.
C. prophase II of meiosis only
D. prophase I and prophase II of meiosis.

96. Figure _____ represents meiosis II for an organism with a diploid number of 4



A. A
B. B
C. C
D. D

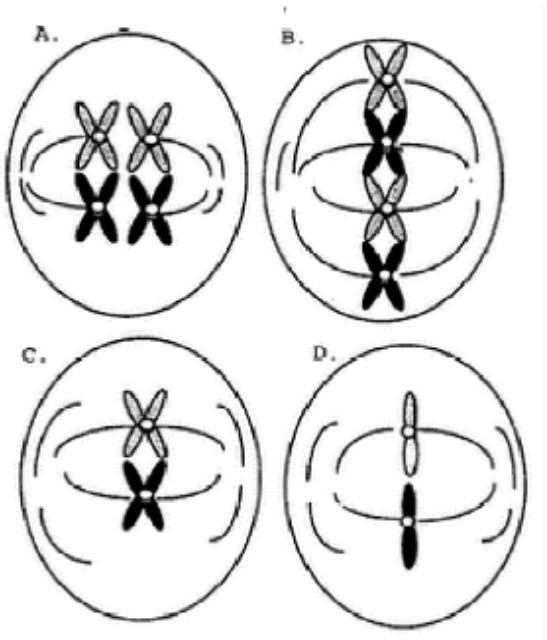
97. Which figure below represents meiosis I for an organism with a diploid number of 4?



A. A
B. B
C. C
D. D

98.

Diagram B in the figure below could represent the cell of an organism with a diploid number of ____ undergoing ___



A. 4; meiosis I
B. 8; meiosis I
C. 4; meiosis II
D. 8; meiosis II

99. The process of producing sex cells is

A. fertilization.
B. mitosis
C. gametogenesis
D. ovulation.

100. The gonads of females are

A. eggs.
B. ovaries
C. semen.
D. testes

101. The male gametes are

A. testes
B. zygotes.
C. semen
D. sperm

102. Fertilization produces

A. eggs
B. zygotes
C. haploid cells
D. gametes.

103. Nondisjunction in humans can result in a person with

A. twenty-two pairs of autosomes, an X chromosome, and a Y chromosome
B. twenty-two pairs of autosomes and two X chromosomes
C. forty-seven chromosomes
D. forty-six chromosomes

104. _____ during prophase of prophase I.

A. Chromosomes become visible
B. Chromosomes synapse and crossover
C. Chromosomes separate
D. DNA replication occurs

105. A zygote

A. is haploid
B. contains all of the genes from each parent
C. is formed by meiosis
D. is genetically different from either parent

106. During which of the following stages of meiosis is the cell haploid?

A. prophase I
B. anaphase II
C. metaphase I
D. anaphase I

107. If in male fruit flies, crossing-over does not occur during meiosis, while in females crossing-over does occur

A. there is less genetic variety among sperm than among eggs.
B. fewer sperm are produced than eggs

C. males are not necessary for fertilization in fruit flies
D. more female offspring will be produced than male offspring.

108. During which of the following stages of meiosis does the cell contain the LEAST amount of DNA?

A. telophase II
B. prophase II
C. anaphase I
D. prophase I

109. Which of the following is necessary before any of the other events can occur?

A. independent assortment
B. segregation
C. haploid cell
D. pairing of homologous chromosomes

110. During which of the following stages of meiosis is the cell diploid?

A. metaphase II
B. anaphase I
C. metaphase I
D. prophase II

111. During which of the following stages of meiosis does the cell contain the greatest amount of DNA?

A. telophase I
B. prophase I
C. anaphase I
D. prophase I

112. Which of the following does NOT occur during prophase I of meiosis?

A. synapsis
B. crossing-over
C. independent assortment
D. nuclear membrane disappears

113. Which one of the following is typical of meiosis? All the cells produced

A. are identical
B. contain more genes than the parent cells
C. are haploid.
D. have undergone nondisjunction

114. During anaphase I of meiosis

A. crossing-over occurs
B. homologous chromosomes pair up.
C. mutations are common
D. segregation of alleles occurs

115. In which of the following ways does an anaphase I cell differ from an anaphase II cell?

A. Anaphase I cells have fewer chromosomes than Anaphase II cells.
B. Anaphase I cells lack a nuclear membrane; anaphase II cells have a nuclear membrane
C. Anaphase I cells are capable of fertilization and anaphase II cells are not
D. Anaphase I cells have chromosomes separating; anaphase II cells have chromatids separating

116. In which of the following ways does a telophase I cell differ from a telophase II cell?

A. Telophase I cells have fewer chromosomes than telophase II cells
B. Telophase I cells lack a nuclear membrane; telophase II cells have a nuclear membrane
C. Telophase I cells are capable of fertilization and telophase II cells are not.
D. Telophase I cells have chromosomes consisting of two chromatids; telophase II cells only have chromatids

117. Which of the following represents normal fertilization in humans?

A. 2n + 2n = 4n
B. n + 2n = 2n
C. n + n = 2n
D. 2n = n

118. Meiosis is necessary if

A. the chromosome number of a sexually reproducing species is to remain the same generation after generation
B. life is to continue on the planet.
C. all organisms of a species are to remain the same
D. mutations are to be stopped.

119. If an organism proceeds through meiosis and produces sex cells with 32 chromosomes (e.g., a horse), the cells of the horse will each contain _____ chromosomes.

A. 32

B. 16
C. 64
D. 12

120. If a body cell has 8 chromosomes (e.g., fruit fly), how many pairs will form during Prophase II?

A. 4
B. 8
C. 2
D. None of these is correct

121. "She looks a little like her dad and a little like her mom." This may have resulted from

A. crossing-over.
B. genetic recombination.
C. independent assortment
D. All are possible

122. "Boy! You can line up all these homologous pairs of chromosomes in a lot of different ways!" This process is referred to as a

A. segregation.
B. synapse
C. independent assortment
D. crossing-over.

123. "She got some chromosomes from her grandfather and some from her grandmother." This is best explained by

A. independent assortment
B. cross-over.
C. mitosis
D. linked genes.

124. Segregation is a source of variety in gametogenesis because

A. it is during segregation that chromosomes from the parents are separated at random into the gametes
B. crossing-over during segregation mixes genes from the parents into the offspring
C. all the genes from one parent are separated from the other parents.
D. new gene combinations are formed by the parent

125. Nondisjunction in humans can result in

A. 22 pairs of autosomes, an X chromosome and a Y chromosome
B. 22 pairs of autosomes, and two X chromosomes.
C. 47 chromosomes
D. 46 chromosomes

126. This occurs when there is a problem with controlling how cells divide and replace themselves.

A. crossing over
B. nondisjunction
C. cancer
D. death

127. Centromeres separate allowing the chromatids to move toward the poles in

A. Anaphase II
B. Anaphase I.
C. Prophase I
D. Telophase II.

128. Homologous chromosomes recognize one another by their centromeres, move through the cell toward one another, and come to li
each other in a process called

A. crossing over.
B. synapsis.
C. differentiation.
D. trisomy.

129. Cells are constantly manipulating their DNA and histone proteins to regulate

A. gene expression.
B. mutation formation
C. crossing-over.
D. segregation.

130. The difference among cell types is not in the genes they possess, but in the genes they express, i.e., through epigenetics.

A. mutate, posses
B. possess, express
C. express, posses
D. control, express

9 KEY

1. Two chromatids are connected at a

A. centromere
B. spindle.
C. centriole.
D. chromosome

Blooms Level: 1. Remember
Enger - Chapter 09 #1
Learning Outcome: Identify the types of cellular activities that occur during S phase.
Section: 09.02
Topic: Cell Cycle and Mitosis

2. Fibers extending from cell pole to cell pole are called the

A. cleavage furrow
B. cell plate.
C. cell equator.
D. spindle

Blooms Level: 1. Remember
Enger - Chapter 09 #2
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.03
Topic: Cell Cycle and Mitosis

3. An organelle found in animals and involved in cell division is the

A. lysosome.
B. mitochondrion.
C. Golgi apparatus
D. centriole.

Blooms Level: 1. Remember
Enger - Chapter 09 #3
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.03
Topic: Cell Cycle and Mitosis

4. During prophase ____ are formed.

A. nucleoli
B. new chromosomes
C. spindles
D. centromeres

Blooms Level: 1. Remember
Enger - Chapter 09 #4
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.03
Topic: Cell Cycle and Mitosis

5. Chromosomes align along the equator during

A. metaphase.
B. anaphase
C. telophase
D. prophase

Blooms Level: 1. Remember
Enger - Chapter 09 #5
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.03
Topic: Cell Cycle and Mitosis

6. In a human, the 46 chromosomes would be at the equator during

A. interphase.
B. prophase.
C. anaphase.
D. metaphase.

Blooms Level: 2. Understand
Enger - Chapter 09 #6
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.03
Topic: Cell Cycle and Mitosis

7. Daughter cells are formed during

A. metaphase.
B. anaphase
C. prophase.
D. telophase

Blooms Level: 1. Remember
Enger - Chapter 09 #7
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.03
Topic: Cell Cycle and Mitosis

8. Chromosomes move toward the poles during

A. metaphase.
B. telophase
C. anaphase
D. interphase

Blooms Level: 1. Remember
Enger - Chapter 09 #8
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.03
Topic: Cell Cycle and Mitosis

9. Chromosomes first become visible during

A. telophase
B. prophase
C. anaphase
D. metaphase.

Blooms Level: 1. Remember
Enger - Chapter 09 #9
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.03
Topic: Cell Cycle and Mitosis

10. When the chromosomes have moved around so that they all lie on a plane in the middle of the cell, the stage is called

A. anaphase
B. metaphase.
C. prophase
D. telophase

Blooms Level: 1. Remember
Enger - Chapter 09 #10
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.03
Topic: Cell Cycle and Mitosis

11. The stage during which chromosomes shorten and condensing their nucleoprotein is called

A. anaphase
B. metaphase
C. prophase
D. telophase

Blooms Level: 1. Remember
Enger - Chapter 09 #11
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.03
Topic: Cell Cycle and Mitosis

12. In what mitotic stage does the cytoplasm divide?

A. prophase
B. metaphase
C. anaphase
D. telophase

Blooms Level: 1. Remember
Enger - Chapter 09 #12
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.03
Topic: Cell Cycle and Mitosis

13. Which of the following is NOT true concerning mitosis?

A. It insures the immortality of the genetic information possessed by an organism
B. The DNA molecule replicates before any chromosomes can be seen
C. It is the process that heals a wound
D. It accounts for most of the increase in size of growing plants and animals

Blooms Level: 2. Understand
Enger - Chapter 09 #13
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.02
Section: 09.03
Topic: Cell Cycle and Mitosis

14. The most important result of mitosis is the

A. production of new varieties of cells to meet changes in the environment
B. exact duplication of the parent cell's genetic information.
C. equal division of the parent cell's genetic information between the two daughter cells
D. equal distribution of the parent's cytoplasm between the two daughter cells

Blooms Level: 2. Understand
Enger - Chapter 09 #14
Learning Outcome: Describe the events that uniquely define each stage.
Learning Outcome: List the stages of mitosis in their proper order.
Section: 09.02
Section: 09.03
Topic: Cell Cycle and Mitosis

15. During prophase of mitosis, the

A. nucleus is preparing for the beginning stage of mitosis that will follow
B. chromosomes are so loosely coiled and stretched out that they are not yet visible.
C. nucleoli and nuclear membrane disappear
D. zygote is formed

Blooms Level: 1. Remember
Enger - Chapter 09 #15
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.03
Topic: Cell Cycle and Mitosis

16. The metaphase stage of mitosis is characterized by the

A. arrangement of chromosomes along a line
B. arrangement of chromosomes on a plane.
C. division of the centromeres
D. duplication of genetic information

Blooms Level: 1. Remember
Enger - Chapter 09 #16
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.03
Topic: Cell Cycle and Mitosis

17. Which of the following does NOT distinguish mitosis in plant cells from mitosis in animal cells?

A. production of a cell plate
B. production of a furrow
C. presence of centrioles
D. presence of centromeres

Blooms Level: 1. Remember
Enger - Chapter 09 #17
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.03
Topic: Cell Cycle and Mitosis

18. During anaphase of mitosis, the

A. nuclear membranes begin to reappear around each of the patches that will soon be daughter nuclei
B. number of distinct chromosomes present is twice the number that were present before mitosis started
C. centromeres have not divided
D. chromosomes replicate by making exact copies of themselves

Blooms Level: 1. Remember
Enger - Chapter 09 #18
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.03
Topic: Cell Cycle and Mitosis

19. During telophase of mitosis the

A. chromosomes have ended their move toward the poles.
B. daughter cells separate themselves from each other
C. DNA of the chromosomes duplicates in preparation for the cell division.
D. cell's genetic characteristics modify to meet any change in the environment

Blooms Level: 1. Remember
Enger - Chapter 09 #19
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.03
Topic: Cell Cycle and Mitosis

20. After cell division, some cells become differentiated. This means that the

A. become different shapes.
B. become different sizes
C. perform different functions
D. become different in all these ways.

Blooms Level: 2. Understand
Enger - Chapter 09 #20
Learning Outcome: Explain the difference between a differentiated cell and a stem cell.
Section: 09.06
Topic: Cell Cycle and Mitosis

21. The time it takes for cells to divide

A. varies, but it takes sophisticated equipment to measure this small difference.
B. depends on the health and environment of the cell
C. does not vary at all, but is controlled by an internal clock
D. varies widely and unpredictably in cells of the same local area of the same organism during any specific time period.

Blooms Level: 1. Remember
Enger - Chapter 09 #21
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.02
Section: 09.03
Topic: Cell Cycle and Mitosis

22. The order in which the stages of mitosis proceed is

A. anaphase, interphase, metaphase, prophase, telophase
B. interphase, anaphase, metaphase, prophase, telophase
C. prophase, metaphase, anaphase, telophase, interphase.
D. interphase, telophase, prophase, anaphase, metaphase

Blooms Level: 1. Remember
Enger - Chapter 09 #22
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.03
Topic: Cell Cycle and Mitosis

23. _____ is not part of interphase.

A. Gap 1
B. Gap 2
C. Cytokinesis
D. DNA synthesis

Blooms Level: 1. Remember
Enger - Chapter 09 #23
Learning Outcome: Identify the types of cellular activities that occur during G1.

Section: 09.02
Topic: Cell Cycle and Mitosis

24. DNA replication occurs during

A. prophase of mitosis.
B. metaphase of mitosis
C. gap 1 of interphase
D. S phase of interphase

Blooms Level: 1. Remember
Enger - Chapter 09 #24
Learning Outcome: Identify the types of cellular activities that occur during S phase.
Section: 09.02
Topic: Cell Cycle and Mitosis

25. Centromeres are

A. composed of microtubules.
B. two identical sides of a metaphase chromosome
C. regions that attach chromosomes.
D. the structures that contain genetic material.

Blooms Level: 1. Remember
Enger - Chapter 09 #25
Learning Outcome: Identify the types of cellular activities that occur during S phase.
Section: 09.02
Topic: Cell Cycle and Mitosis

26. Which of the following is NOT true of cytokinesis?

A. Cytokinesis is the division of cytoplasm and its contents
B. The formation of a cell plate in plants results in cytokinesis.
C. The formation of a cleavage furrow in animals results in cytokinesis
D. Cytokinesis occurs during interphase

Blooms Level: 2. Understand
Enger - Chapter 09 #26
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.03
Topic: Cell Cycle and Mitosis

27. ____ is NOT an event of telophase.

A. Uncoiling of chromosomes
B. Disappearance of spindles
C. Nuclear membranes forming to create daughter nuclei
D. Breaking down of nucleoli

Blooms Level: 1. Remember
Enger - Chapter 09 #27
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.03
Topic: Cell Cycle and Mitosis

28. A cell that contains eight chromosomes and is undergoing mitosis will produce ____ daughter cell(s); each daughter cell will contain ____ chromosomes.

A. two; eight
B. two; four
C. four; four
D. one; eight

Blooms Level: 4. Analyze
Enger - Chapter 09 #28
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.03
Topic: Cell Cycle and Mitosis

29. Chromosomes are composed of two chromatids during

A. gap 1.
B. telophase
C. metaphase
D. anaphase

Blooms Level: 1. Remember
Enger - Chapter 09 #29
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.03
Topic: Cell Cycle and Mitosis

30. The process of cell specialization within a multicellular organism is

A. cancer
B. cytokinesis
C. mitosis.
D. determination

Blooms Level: 1. Remember
Enger - Chapter 09 #30
Learning Outcome: Explain the difference between a differentiated cell and a stem cell.
Section: 09.06
Topic: Cell Cycle and Mitosis

31. In which of the following stages of the cell cycle would you find chromosomes separated into individual chromatids?

A. prophase
B. metaphase

C. telophase
D. cytokinesis

Blooms Level: 1. Remember
Enger - Chapter 09 #31
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.02
Section: 09.03
Topic: Cell Cycle and Mitosis

32. The normal outcome of mitosis is

A. to make cells smaller
B. to produce genetically identical copies of cells
C. to reduce the amount of DNA in daughter cells
D. differentiation

Blooms Level: 1. Remember
Enger - Chapter 09 #32
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.01
Section: 09.03
Topic: Cell Cycle and Mitosis

33. In which of the following stages of the cell cycle does the cell contain chromosomes consisting of 2 chromatids joined by a centromere?

A. anaphase
B. metaphase
C. cytokinesis
D. telophase

Blooms Level: 1. Remember
Enger - Chapter 09 #33
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.03
Topic: Cell Cycle and Mitosis

34. Which of the following is typical of interphase?

A. DNA replicates
B. The chromosomes get short and thick.
C. The nucleolus disappears
D. The cell does nothing.

Blooms Level: 1. Remember
Enger - Chapter 09 #34
Learning Outcome: Identify the types of cellular activities that occur during S phase.
Section: 09.02
Topic: Cell Cycle and Mitosis

35. A dividing cell lacks a nuclear membrane, contains chromosomes consisting of two chromatids, and has clearly visible centrioles. This is which one of the following stages?

A. metaphase
B. anaphase
C. interphase
D. telophase

Blooms Level: 2. Understand
Enger - Chapter 09 #35
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.03
Topic: Cell Cycle and Mitosis

36. "I can tell this cell is in metaphase because . . ."

A. the chromatids are dividing.
B. the spindle is being formed.
C. the chromosomes are aligned on the equator of the cell
D. the nuclear membrane is forming

Blooms Level: 2. Understand
Enger - Chapter 09 #36
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.03
Topic: Cell Cycle and Mitosis

37. _____ may cause cancer

A. Chemotherapeutic agents
B. Mutagenic agents
C. Meiosis
D. Cytokinesis

Blooms Level: 1. Remember
Enger - Chapter 09 #37
Learning Outcome: Describe how cancer is caused by a failure to control cell division.
Section: 09.05
Topic: Cell Cycle and Mitosis

38. Cells spend most of their life

A. in the G_0 phase
B. dividing.
C. in metaphase.
D. undergoing differentiation.

Blooms Level: 1. Remember
Enger - Chapter 09 #38
Learning Outcome: Identify the types of cellular activities that occur during G1.

Section: 09.02
Topic: Cell Cycle and Mitosis

39. DNA is synthesized in which stage of the typical cell cycle?

A. prophase
B. G_1
C. S
D. G_2

Blooms Level: 1. Remember
Enger - Chapter 09 #39
Learning Outcome: Identify the types of cellular activities that occur during S phase.
Section: 09.02
Topic: Cell Cycle and Mitosis

40. The whole point of mitosis is to

A. be sure that DNA is replicated
B. reproduce the parent cell into genetically identical daughter cells
C. reproduce the parent cell into similar but not identical daughter cells
D. produce sex cells (gametes).

Blooms Level: 2. Understand
Enger - Chapter 09 #40
Learning Outcome: List three important purposes of cell division.
Section: 09.02
Section: 09.03
Topic: Cell Cycle and Mitosis

41. Which of the following techniques would be useful in controlling cancer once it has formed an abnormal growth?

A. Prevent mutations from occurring in the cancer cells.
B. Treat the cancer with drugs or other therapies that selectively kill dividing cells
C. Increase the mutation rate to kill the cancer cells.
D. Increase the rate of mitosis in the cancer cells

Blooms Level: 1. Remember
Enger - Chapter 09 #41
Learning Outcome: Describe how cancer is caused by a failure to control cell division.
Learning Outcome: Describe how chemotherapy and radiation can be effective treatments for cancer.
Section: 09.05
Topic: Cell Cycle and Mitosis

42. During which of the following stages of the cell cycle does DNA replication take place?

A. prophase
B. interphase
C. telophase
D. anaphase

Blooms Level: 1. Remember
Enger - Chapter 09 #42
Learning Outcome: Identify the types of cellular activities that occur during S phase.
Section: 09.02
Topic: Cell Cycle and Mitosis

43. Controlled cell death is termed

A. apoptosis
B. metastasis
C. malignancy.
D. tumor formation.

Blooms Level: 1. Remember
Enger - Chapter 09 #43
Learning Outcome: Describe the role of p53 in controlling cell division.
Section: 09.04
Topic: Cell Cycle and Mitosis

44. Tumors that are harmful, non-encapsulated growths of cells are known as

A. benign
B. malignant
C. metastasized.
D. carcinogenic

Blooms Level: 1. Remember
Enger - Chapter 09 #44
Learning Outcome: Describe how cancer is caused by a failure to control cell division.
Section: 09.05
Topic: Cell Cycle and Mitosis

45. The physician explained that her cancer had metastasized to

A. spread from its original site.
B. shrunk in size
C. become benign.
D. stopped growing

Blooms Level: 1. Remember
Enger - Chapter 09 #45
Learning Outcome: Describe how cancer is caused by a failure to control cell division.
Section: 09.05
Topic: Cell Cycle and Mitosis

46. A normally functioning muscle cell is in which stage of its cycle?

A. G_2

B. anaphase
C. G_0
D. cytokinesis

Blooms Level: 2. Understand
Enger - Chapter 09 #46
Learning Outcome: Identify the types of cellular activities that occur during G1.
Section: 09.02
Topic: Cell Cycle and Mitosis

47. Proteins required for the spindles are synthesized in the

A. G_2 stage
B. S stage.
C. G_0 stage.
D. G_1 stage

Blooms Level: 1. Remember
Enger - Chapter 09 #47
Learning Outcome: Identify the types of cellular activities that occur during G2.
Section: 09.02
Topic: Cell Cycle and Mitosis

48. Radiation most likely destroys cancer cells by inducing a process calle

A. cytokinesis
B. protein disintegration.
C. differentiation
D. apoptosis

Blooms Level: 1. Remember
Enger - Chapter 09 #48
Learning Outcome: Describe how chemotherapy and radiation can be effective treatments for cancer.
Section: 09.04
Topic: Cell Cycle and Mitosis

49. When the gene p53 initiates apoptosis, the cell's DNA causes the cell to

A. enterprophase
B. spontaneously break down the cell membrane.
C. become differentiated
D. digest itself from the inside out.

Blooms Level: 2. Understand
Enger - Chapter 09 #49
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.03
Topic: Cell Cycle and Mitosis

50. A cell mass that does NOT fragment and spread beyond its original area of growth is known as a(n)

A. benign tumor
B. atumoron
C. malignant tumor
D. nodule

Blooms Level: 1. Remember
Enger - Chapter 09 #50
Learning Outcome: Describe how cancer is caused by a failure to control cell division.
Section: 09.05
Topic: Cell Cycle and Mitosis

51. The _____ on the chromosome is where the spindle fibers bind to the chromosome and is responsible for the shortening of spi fibers during anaphase.

A. chromatin
B. centromere
C. tubulin
D. kinetochore

Blooms Level: 1. Remember
Enger - Chapter 09 #51
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.03
Topic: Cell Cycle and Mitosis

52. Homologous chromosomes **separate** during

A. metaphase
B. anaphase
C. anaphase I.
D. anaphase II

Blooms Level: 1. Remember
Enger - Chapter 09 #52
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.08
Topic: Meiosis

53. This is the type of cell division used by most prokaryotes

A. mitosis
B. binary fission
C. binary fusion
D. meiosis

Blooms Level: 1. Remember
Enger - Chapter 09 #53

Learning Outcome: Explain the differences between asexual and sexual reproduction
Section: 09.01
Topic: Cell Cycle and Mitosis

54. In meiosis, centromeres split in

A. telophase I.
B. anaphase I.
C. telophase II.
D. anaphase II.

Blooms Level: 1. Remember
Enger - Chapter 09 #54
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.08
Topic: Meiosis

55. Crossing-over occurs in

A. prophase I.
B. prophase II.
C. metaphase II.
D. Both prophase I and II.

Blooms Level: 1. Remember
Enger - Chapter 09 #55
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.08
Topic: Meiosis

56. The exchange of chromosome parts may occur during

A. telophase II.
B. anaphase II.
C. prophase I.
D. metaphase II.

Blooms Level: 1. Remember
Enger - Chapter 09 #56
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.08
Topic: Meiosis

57. When homologous chromosomes are at the equator of the cell, it is in

A. telophase
B. metaphase I.
C. metaphase II.
D. Any of these stages

Blooms Level: 1. Remember
Enger - Chapter 09 #57
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.08
Topic: Meiosis

58. Cytokinesis may occur during

A. prophase I.
B. metaphase I.
C. anaphase I.
D. telophase I.

Blooms Level: 1. Remember
Enger - Chapter 09 #58
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.08
Topic: Meiosis

59. The spindle begins to form in

A. telophase I.
B. prophase I.
C. interphase
D. telophase II.

Blooms Level: 1. Remember
Enger - Chapter 09 #59
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.08
Topic: Meiosis

60. Two nuclei are formed during

A. prophase I.
B. metaphase I.
C. anaphase I.
D. telophase I.

Blooms Level: 1. Remember
Enger - Chapter 09 #60
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.08
Topic: Meiosis

61. Chromosomes first become visible during

A. prophase I.
B. metaphase I.
C. anaphase I.

D. telophase I

Blooms Level: 1. Remember
Enger - Chapter 09 #61
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.08
Topic: Meiosis

62. Chromosomes move toward the poles during

A. anaphase II
B. metaphase II
C. prophase II.
D. telophase II

Blooms Level: 1. Remember
Enger - Chapter 09 #62
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.08
Topic: Meiosis

63. The centromere divides during

A. metaphase II
B. telophase II
C. anaphase II.
D. prophase II

Blooms Level: 1. Remember
Enger - Chapter 09 #63
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.08
Topic: Meiosis

64. Spindles disappear during

A. prophase I.
B. telophase II
C. anaphase II
D. metaphase I

Blooms Level: 1. Remember
Enger - Chapter 09 #64
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.08
Topic: Meiosis

65. During metaphase I of meiosis,

A. individual chromosomes line up at the poles.
B. homologous pairs are aligned at the equator
C. pairs of chromosomes separate from other pairs by spindle rays.
D. only one member of each pair is in each cell.

Blooms Level: 1. Remember
Enger - Chapter 09 #65
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.08
Topic: Meiosis

66. During anaphase II of meiosis,

A. the centrioles form.
B. daughter cells form.
C. chromosomes move to poles
D. chromatids exchange parts.

Blooms Level: 1. Remember
Enger - Chapter 09 #66
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.08
Topic: Meiosis

67. During which stage does cytokinesis happen?

A. prophase I
B. anaphase I
C. telophase I
D. metaphase II

Blooms Level: 1. Remember
Enger - Chapter 09 #67
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.08
Topic: Meiosis

68. Independent assortment refers to the fact that

A. a cell will divide and produce various offspring regardless of whether another cell is dividing.
B. mitosis normally produces cells that are like each other and like parent cell
C. the daughter cell that receives the maternal #1 chromosome will not necessarily receive the maternal #2
D. a crossover between two chromosomes will produce offspring unlike either parent

Blooms Level: 1. Remember
Enger - Chapter 09 #68
Learning Outcome: Describe how sexual reproduction increases genetic diversity through crossing over.
Section: 09.09
Topic: Meiosis

69. Segregation

A. happens whenever a cell is fertilized.
B. happens when chromosomes separate and move to the poles.
C. is the separation between daughter cells after cell division
D. None of these answers defines segregation.

Blooms Level: 1. Remember
Enger - Chapter 09 #69
Learning Outcome: Describe how sexual reproduction increases genetic diversity through segregation.
Section: 09.09
Topic: Meiosis

70. Equivalent segments of DNA are exchanged between chromosomes as a result of

A. segregation.
B. crossing-over.
C. fertilization.
D. independent assortment

Blooms Level: 1. Remember
Enger - Chapter 09 #70
Learning Outcome: Describe how sexual reproduction increases genetic diversity through crossing over.
Section: 09.09
Topic: Meiosis

71. The separation of homologous chromosomes is called

A. synapsis
B. segregation.
C. mitosis
D. fertilization.

Blooms Level: 1. Remember
Enger - Chapter 09 #71
Learning Outcome: Describe how sexual reproduction increases genetic diversity through segregation.
Section: 09.09
Topic: Meiosis

72. Sometimes the gene for blue eye color is in the same gamete as the gene for curly hair, but they are in different gametes just as often. Why?

A. crossing-over
B. independent assortment
C. fertilization
D. segregation

Blooms Level: 1. Remember
Enger - Chapter 09 #72
Learning Outcome: Describe how sexual reproduction increases genetic diversity through independent assortment.
Section: 09.09
Topic: Meiosis

73. Normally, a gamete gets only one of a pair of alleles. This is true because of

A. crossing-over.
B. independent assortment
C. fertilization.
D. segregation.

Blooms Level: 1. Remember
Enger - Chapter 09 #73
Learning Outcome: Describe how sexual reproduction increases genetic diversity through segregation.
Section: 09.09
Topic: Meiosis

74. Crossing-over results in

A. chromosome duplication.
B. new combinations of genes.
C. point mutations
D. All of these answers are true.

Blooms Level: 2. Understand
Enger - Chapter 09 #74
Learning Outcome: Describe how sexual reproduction increases genetic diversity through crossing over.
Section: 09.09
Topic: Meiosis

75. Segregation refers to the separation of

A. linked genes from each other
B. alleles.
C. dominant genes from the rest of the chromosome
D. assorted structures in the cell

Blooms Level: 1. Remember
Enger - Chapter 09 #75
Learning Outcome: Describe how sexual reproduction increases genetic diversity through segregation.
Section: 09.09
Topic: Meiosis

76. If the blood type and the number of fingers are inherited independently, this means

A. they are on the same chromosome
B. they are linked to each other.
C. they segregate randomly.
D. B blood and six fingers are rare.

Blooms Level: 2. Understand
Enger - Chapter 09 #76
Learning Outcome: Describe how sexual reproduction increases genetic diversity through segregation.
Section: 09.09

Topic: Meiosis

77. Nondisjunction is the process

A. in which homologous chromosomes fail to segregate normally.
B. in which abnormal cytokinesis occurs.
C. in which metaphase is not allowed to occur
D. described by two of these statements.

Blooms Level: 1. Remember
Enger - Chapter 09 #77
Learning Outcome: Explain how nondisjunction can result in loss of genetic material or the gain of genetic material.
Section: 09.10
Topic: Meiosis

78. Nondisjunction results in

A. two small daughter cells that disappear and two normal-sized cells
B. two polar bodies
C. daughter cells with different numbers of chromosomes.
D. two cells with equal numbers of chromosomes

Blooms Level: 1. Remember
Enger - Chapter 09 #78
Learning Outcome: Explain how nondisjunction can result in loss of genetic material or the gain of genetic material.
Section: 09.10
Topic: Meiosis

79. Nondisjunction may result in a person with twenty-three pairs of chromosomes

A. plus an extra chromosome.
B. minus a sex chromosome.
C. with an extra chromosome number 21.
D. All of these answers are true.

Blooms Level: 1. Remember
Enger - Chapter 09 #79
Learning Outcome: Explain how nondisjunction can result in loss of genetic material or the gain of genetic material.
Section: 09.10
Topic: Meiosis

80. If segregation does NOT occur, the result will be

A. crossing-over.
B. independent assortment
C. nondisjunction
D. fertilization.

Blooms Level: 2. Understand
Enger - Chapter 09 #80
Learning Outcome: Explain how nondisjunction can result in loss of genetic material or the gain of genetic material.
Section: 09.10
Topic: Meiosis

81. An excess number of chromosomes in a gamete results from

A. mutation
B. nondisjunction.
C. crossing-over.
D. fertilization.

Blooms Level: 1. Remember
Enger - Chapter 09 #81
Learning Outcome: Explain how chromosomal abnormalities can result in the loss of genetic material or the gain of genetic material
Learning Outcome: Explain how nondisjunction can result in loss of genetic material or the gain of genetic material.
Section: 09.10
Topic: Meiosis

82. The process of cell specialization within a multicellular organism is

A. cancer
B. cytokinesis
C. mitosis
D. determination

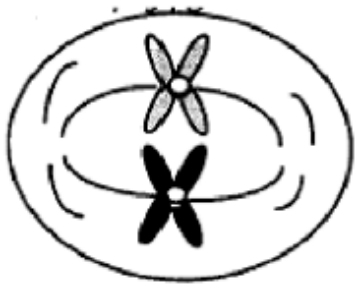
Blooms Level: 2. Understand
Enger - Chapter 09 #82
Learning Outcome: Explain how the process of determination relates to stem cells and differentiated cells.
Learning Outcome: Explain the difference between a differentiated cell and a stem cell.
Section: 09.06
Topic: Cell Cycle and Mitosis

83. The cell below is in

A. prophase
B. telophase.
C. anaphase
D. metaphase

Blooms Level: 4. Analyze
Enger - Chapter 09 #83
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.03
Topic: Cell Cycle and Mitosis

84. The cell below is in



A. prophase
B. telophase
C. anaphase
D. metaphase.

Blooms Level: 4. Analyze
Enger - Chapter 09 #84
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.03
Topic: Cell Cycle and Mitosis

85. Two genes that are located in close proximity to one another on the same chromosome are said to be

A. mutated
B. linked
C. grouped
D. homologous

Blooms Level: 1. Remember
Enger - Chapter 09 #85
Learning Outcome: Describe how sexual reproduction increases genetic diversity through segregation.
Section: 09.10
Topic: Cell Cycle and Mitosis

86. Synapsis is the

A. exchange of genetic material between homologous chromosomes
B. condition in which homologous chromosomes pair and lie close to each other.
C. independent assortment of homologous chromosomes
D. separation and movement of homologous chromosomes to the poles

Blooms Level: 1. Remember
Enger - Chapter 09 #86
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.08
Topic: Meiosis

87. The sex organ in plants that produces the male gamete is called the

A. pistil.
B. autosome
C. anther.
D. testes

Blooms Level: 1. Remember
Enger - Chapter 09 #87
Learning Outcome: Explain the differences between asexual and sexual reproduction.
Section: 09.07
Topic: Meiosis

88. _____ does not contribute to genetic variety.

A. Independent assortment
B. Cytokinesis
C. Sexual reproduction
D. Crossing-over

Blooms Level: 2. Understand
Enger - Chapter 09 #88
Learning Outcome: List three important purposes of cell division.
Section: 09.03
Topic: Meiosis

89. Which of the following is **false** regarding nondisjunction?

A. Nondisjunction results in sex cells having too few or too many chromosomes.
B. The frequency of nondisjunction increases in women over the age of 37
C. Nondisjunction is a cause of Down syndrome
D. A cell with one too few chromosomes is trisomic

Blooms Level: 2. Understand
Enger - Chapter 09 #89
Learning Outcome: Explain how chromosomal abnormalities can result in the loss of genetic material or the gain of genetic mater
Learning Outcome: Explain how nondisjunction can result in loss of genetic material or the gain of genetic material.
Section: 09.10
Topic: Meiosis

90. If the haploid number of an organism is 6, the diploid number will be

A. 3.
B. 6.
C. 9.

D. 12.

Blooms Level: 2. Understand
Enger - Chapter 09 #90
Learning Outcome: Identify if the cell is diploid or haploid for each stage.
Section: 09.07
Topic: Meiosis

91. If the haploid number for an organism is 20, the number of chromosomes in each gamete will be

A. 5.
B. 10.
C. 20.
D. 40.

Blooms Level: 2. Understand
Enger - Chapter 09 #91
Learning Outcome: Identify if the cell is diploid or haploid for each stage.
Section: 09.07
Topic: Meiosis

92. Chromosome number reduces during

A. mitosis
B. interphase
C. meiosis I.
D. meiosis II

Blooms Level: 1. Remember
Enger - Chapter 09 #92
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.08
Topic: Meiosis

93. Chromatids separate and move toward opposite poles during

A. mitosis only.
B. meiosis I and meiosis II.
C. mitosis and meiosis II.
D. mitosis, and meiosis I and meiosis II

Blooms Level: 1. Remember
Enger - Chapter 09 #93
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.08
Topic: Meiosis

94. A pair of chromosomes that contain alleles for the same genes at the same locations are

A. haploid.
B. homologous
C. homozygous
D. synapsed.

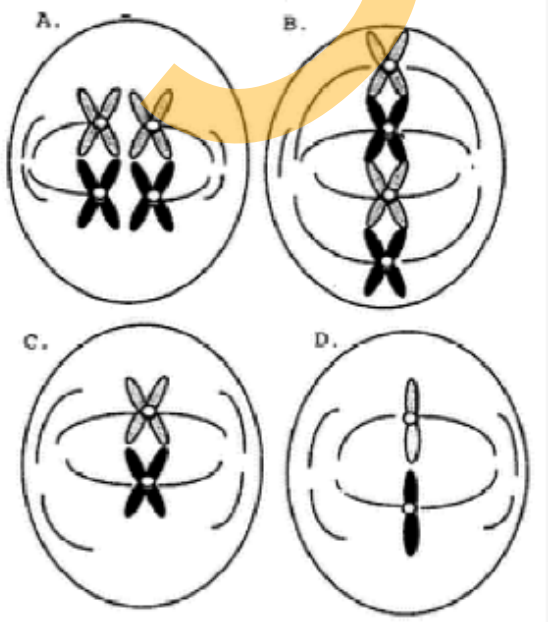
Blooms Level: 1. Remember
Enger - Chapter 09 #94
Learning Outcome: Explain the differences between asexual and sexual reproduction.
Section: 09.07
Topic: Meiosis

95. Crossing-over and synapsis occur during

A. prophase of mitosis only
B. prophase I of meiosis only
C. prophase II of meiosis only
D. prophase I and prophase II of meiosis.

Blooms Level: 1. Remember
Enger - Chapter 09 #95
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.08
Topic: Meiosis

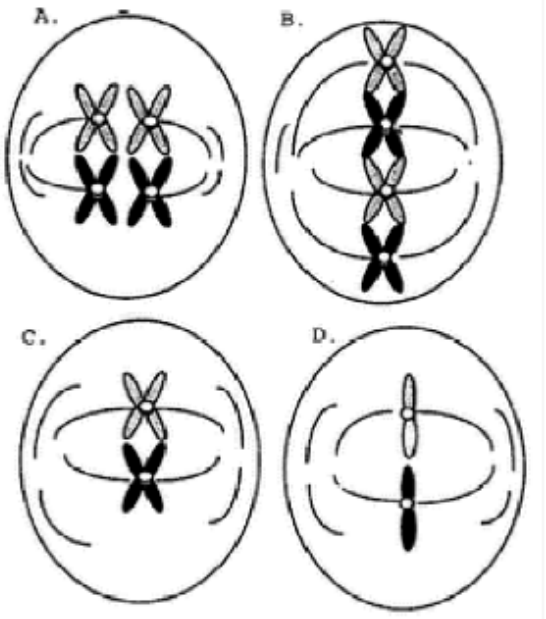
96. Figure _____ represents meiosis II for an organism with a diploid number of 4.



A. A
B. B
C. C
D. D

Blooms Level: 4. Analyze
Enger - Chapter 09 #96
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.08
Topic: Meiosis

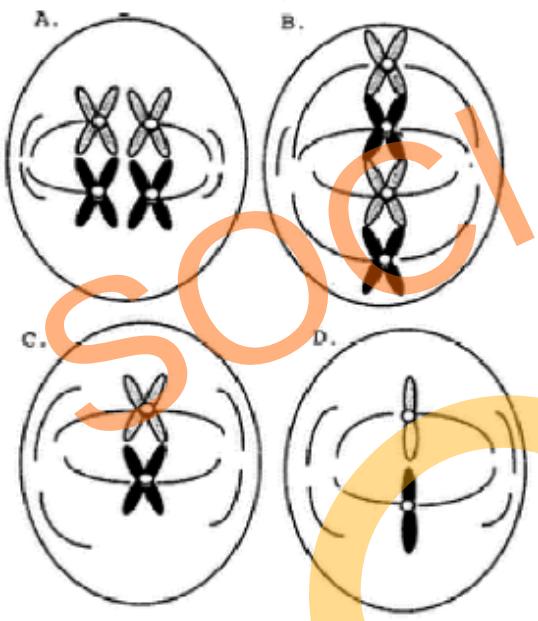
97. Which figure below represents meiosis I for an organism with a diploid number of 4?



A. A
B. B
C. C
D. D

Blooms Level: 4. Analyze
Enger - Chapter 09 #97
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.08
Topic: Meiosis

98. Diagram B in the figure below could represent the cell of an organism with a diploid number of ____ undergoing ___.



A. 4; meiosis I
B. 8; meiosis I
C. 4; meiosis II
D. 8; meiosis II

Blooms Level: 4. Analyze
Enger - Chapter 09 #98
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.08
Topic: Meiosis

99. The process of producing sex cells is

A. fertilization.
B. mitosis.
C. gametogenesis
D. ovulation

Blooms Level: 1. Remember
Enger - Chapter 09 #99
Learning Outcome: Explain the differences between asexual and sexual reproduction.
Section: 09.07
Topic: Meiosis

100. The gonads of females are

A. eggs
B. ovaries
C. semen.
D. testes

Blooms Level: 1. Remember
Enger - Chapter 09 #100
Learning Outcome: Explain the differences between asexual and sexual reproduction.
Section: 09.07
Topic: Meiosis

101. The male gametes are

A. testes
B. zygotes.
C. semen
D. sperm

Blooms Level: 1. Remember
Enger - Chapter 09 #101
Learning Outcome: Explain the differences between asexual and sexual reproduction.
Section: 09.07
Topic: Meiosis

102. Fertilization produces

A. eggs.
B. zygotes.
C. haploid cells
D. gametes

Blooms Level: 1. Remember
Enger - Chapter 09 #102
Learning Outcome: Explain the differences between asexual and sexual reproduction.
Section: 09.07
Topic: Meiosis

103. Nondisjunction in humans can result in a person with

A. twenty-two pairs of autosomes, an X chromosome, and a Y chromosome
B. twenty-two pairs of autosomes and two X chromosomes
C. forty-seven chromosomes
D. forty-six chromosomes

Blooms Level: 1. Remember
Enger - Chapter 09 #103
Learning Outcome: Explain how nondisjunction can result in loss of genetic material or the gain of genetic material.
Section: 09.10
Topic: Meiosis

104. _____ during prophase of prophase I.

A. Chromosomes become visible
B. Chromosomes synapse and crossover
C. Chromosomes separate
D. DNA replication occurs

Blooms Level: 1. Remember
Enger - Chapter 09 #104
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.08
Topic: Meiosis

105. A zygote

A. is haploid.
B. contains all of the genes from each parent
C. is formed by meiosis.
D. is genetically different from either parent.

Blooms Level: 1. Remember
Enger - Chapter 09 #105
Learning Outcome: Explain the differences between asexual and sexual reproduction.
Section: 09.07
Topic: Meiosis

106. During which of the following stages of meiosis is the cell haploid?

A. prophase I
B. anaphase II
C. metaphase I
D. anaphase I

Blooms Level: 1. Remember
Enger - Chapter 09 #106
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.08
Topic: Meiosis

107. If in male fruit flies, crossing-over does not occur during meiosis, while in females crossing-over does occur

A. there is less genetic variety among sperm than among eggs.
B. fewer sperm are produced than eggs.
C. males are not necessary for fertilization in fruit flies
D. more female offspring will be produced than male offspring.

Blooms Level: 2. Understand
Enger - Chapter 09 #107
Learning Outcome: Describe how sexual reproduction increases genetic diversity through crossing over.
Section: 09.09
Topic: Meiosis

108. During which of the following stages of meiosis does the cell contain the LEAST amount of DNA?

A. telophase II
B. prophase II
C. anaphase I
D. prophase I

Blooms Level: 2. Understand
Enger - Chapter 09 #108
Learning Outcome: Describe the events that uniquely define each stage.
Learning Outcome: List the stages of meiosis in their proper order.

Section: 09.08
Topic: Meiosis

109. Which of the following is necessary before any of the other events can occur?

A. independent assortment
B. segregation
C. haploid cells
D. pairing of homologous chromosome

Blooms Level: 2. Understand
Enger - Chapter 09 #109
Learning Outcome: List the stages of meiosis in their proper order.
Section: 09.08
Topic: Meiosis

110. During which of the following stages of meiosis is the cell diploid?

A. metaphase II
B. anaphase II
C. metaphase I
D. prophase II

Blooms Level: 1. Remember
Enger - Chapter 09 #110
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.08
Topic: Meiosis

111. During which of the following stages of meiosis does the cell contain the greatest amount of DNA?

A. telophase I
B. prophase II
C. anaphase I
D. prophase I

Blooms Level: 3. Apply
Enger - Chapter 09 #111
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.08
Topic: Meiosis

112. Which of the following does NOT occur during prophase I of meiosis?

A. synapsis
B. crossing-over
C. independent assortment
D. nuclear membrane disappears

Blooms Level: 1. Remember
Enger - Chapter 09 #112
Learning Outcome: Describe the events that uniquely define each stage.
Learning Outcome: List the stages of meiosis in their proper order.
Section: 09.08
Topic: Meiosis

113. Which one of the following is typical of meiosis? All the cells produce

A. are identical
B. contain more genes than the parent cells
C. are haploid.
D. have undergone nondisjunction.

Blooms Level: 2. Understand
Enger - Chapter 09 #113
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.08
Topic: Meiosis

114. During anaphase I of meiosis

A. crossing-over occurs
B. homologous chromosomes pair up.
C. mutations are common
D. segregation of alleles occurs.

Blooms Level: 1. Remember
Enger - Chapter 09 #114
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.08
Topic: Meiosis

115. In which of the following ways does an anaphase I cell differ from an anaphase II cell?

A. Anaphase I cells have fewer chromosomes than anaphase II cells
B. Anaphase I cells lack a nuclear membrane; anaphase II cells have a nuclear membrane.
C. Anaphase I cells are capable of fertilization and anaphase II cells are not
D. Anaphase I cells have chromosomes separating; anaphase II cells have chromatids separating.

Blooms Level: 2. Understand
Enger - Chapter 09 #115
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.08
Topic: Meiosis

116. In which of the following ways does a telophase I cell differ from a telophase II cell?

A. Telophase I cells have fewer chromosomes than telophase II cells
B. Telophase I cells lack a nuclear membrane; telophase II cells have a nuclear membrane.
C. Telophase I cells are capable of fertilization and telophase II cells are not

D. Telophase I cells have chromosomes consisting of two chromatids; telophase II cells only have chromatids

Blooms Level: 2. Understand
Enger - Chapter 09 #116
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.08
Topic: Meiosis

117. Which of the following represents normal fertilization in humans?

A. 2n + 2n = 4n
B. n + 2n = 2n
C. n + n = 2n
D. 2n = n

Blooms Level: 2. Understand
Enger - Chapter 09 #117
Learning Outcome: Explain the differences between asexual and sexual reproduction.
Section: 09.07
Topic: Meiosis

118. Meiosis is necessary if

A. the chromosome number of a sexually reproducing species is to remain the same generation after generation.
B. life is to continue on the planet.
C. all organisms of a species are to remain the same.
D. mutations are to be stopped

Blooms Level: 2. Understand
Enger - Chapter 09 #118
Learning Outcome: Describe the events that uniquely define each stage.
Learning Outcome: List the stages of meiosis in their proper order.
Section: 09.08
Topic: Meiosis

119. If an organism proceeds through meiosis and produces sex cells with 32 chromosomes (e.g., a horse), the cells of this animal's body will each contain _____ chromosomes.

A. 32
B. 16
C. 64
D. 12

Blooms Level: 2. Understand
Enger - Chapter 09 #119
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.08
Topic: Meiosis

120. If a body cell has 8 chromosomes (e.g., fruit fly), how many pairs will form during Prophase II?

A. 4
B. 8
C. 2
D. None of these is correct.

Blooms Level: 2. Understand
Enger - Chapter 09 #120
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.08
Topic: Meiosis

121. "She looks a little like her dad and a little like her mom." This may have resulted from

A. crossing-over.
B. genetic recombination.
C. independent assortment
D. All are possible

Blooms Level: 2. Understand
Enger - Chapter 09 #121
Learning Outcome: Describe how sexual reproduction increases genetic diversity.
Section: 09.09
Topic: Meiosis

122. "Boy! You can line up all these homologous pairs of chromosomes in a lot of different ways!" This process is referred to as

A. segregation.
B. synapse.
C. independent assortment
D. crossing-over.

Blooms Level: 2. Understand
Enger - Chapter 09 #122
Learning Outcome: Describe how sexual reproduction increases genetic diversity.
Section: 09.09
Topic: Meiosis

123. "She got some chromosomes from her grandfather and some from her grandmother." This is best explained by

A. independent assortment
B. cross-over.
C. mitosis.
D. linked genes

Blooms Level: 2. Understand
Enger - Chapter 09 #123
Learning Outcome: Describe how sexual reproduction increases genetic diversity.
Section: 09.09
Topic: Meiosis

124. Segregation is a source of variation in gametogenesis because

A. it is during segregation that chromosomes from the parents are separated at random into the gametes
B. crossing-over during segregation mixes genes from the parents into the offspring.
C. all the genes from one parent are separated from the other parents.
D. new gene combinations are formed by the parent

Blooms Level: 2. Understand
Enger - Chapter 09 #124
Learning Outcome: Describe how sexual reproduction increases genetic diversity.
Section: 09.09
Topic: Meiosis

125. Nondisjunction in humans can result in

A. 22 pairs of autosomes, an X chromosome and a Y chromosome
B. 22 pairs of autosomes, and two X chromosomes.
C. 47 chromosomes.
D. 46 chromosomes

Blooms Level: 4. Analyze
Enger - Chapter 09 #125
Learning Outcome: Explain how nondisjunction can result in loss of genetic material or the gain of genetic material.
Section: 09.10
Topic: Meiosis

126. This occurs when there is a problem with controlling how cells divide and replace themselves.

A. crossing over
B. nondisjunction
C. cancer
D. death

Blooms Level: 1. Remember
Enger - Chapter 09 #126
Learning Outcome: Describe how cancer is caused by a failure to control cell division.
Section: 09.05
Topic: Cell Cycle and Mitosis

127. Centromeres separate allowing the chromatids to move toward the poles in

A. Anaphase II
B. Anaphase I.
C. Prophase I.
D. Telophase II.

Blooms Level: 1. Remember
Enger - Chapter 09 #127
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.08
Topic: Meiosis

128. Homologous chromosomes recognize one another by their centromeres, move through the cell toward one another, and come to lie each other in a process called

A. crossing over.
B. synapsis
C. differentiation
D. trisomy.

Blooms Level: 1. Remember
Enger - Chapter 09 #128
Learning Outcome: Describe the events that uniquely define each stage.
Section: 09.08
Topic: Meiosis

129. Cells are constantly manipulating their DNA and histone proteins to regulate

A. gene expression.
B. mutation formation
C. crossing-over.
D. segregation.

Blooms Level: 2. Understand
Enger - Chapter 09 #129
Learning Outcome: List three important purposes of cell division.
Section: 09.01
Section: 09.02
Section: 09.03
Topic: Cell Cycle and Mitosis

130. The difference among cell types is not in the genes they possess, but in the genes they express, i.e., through epigenetics.

A. mutate, posses
B. possess, express
C. express, posses
D. control, express

Blooms Level: 1. Remember
Enger - Chapter 09 #130
Learning Outcome: Describe how cancer is caused by a failure to control cell division.
Section: 09.05
Topic: Cell Cycle and Mitosis

9 Summary

Category	# of Questions
Blooms Level: 1. Remember	89
Blooms Level: 2. Understand	33
Blooms Level: 3. Apply	1
Blooms Level: 4. Analyze	7
Enger - Chapter 09	130
Learning Outcome: Describe how cancer is caused by a failure to control cell division.	7
Learning Outcome: Describe how chemotherapy and radiation can be effective treatments for cancer.	2
Learning Outcome: Describe how sexual reproduction increases genetic diversity through crossing over.	4
Learning Outcome: Describe how sexual reproduction increases genetic diversity through independent assortment.	1
Learning Outcome: Describe how sexual reproduction increases genetic diversity through segregation.	6
Learning Outcome: Describe how sexual reproduction increases genetic diversity.	4
Learning Outcome: Describe the events that uniquely define each stage.	70
Learning Outcome: Describe the role of p53 in controlling cell division.	1
Learning Outcome: Explain how chromosomal abnormalities can result in the loss of genetic material or the gain of genetic material.	2
Learning Outcome: Explain how nondisjunction can result in loss of genetic material or the gain of genetic material.	8
Learning Outcome: Explain how the process of determination relates to stem cells and differentiated cells.	1
Learning Outcome: Explain the difference between a differentiated cell and a stem cell.	3
Learning Outcome: Explain the differences between asexual and sexual reproduction.	9
Learning Outcome: Identify if the cell is diploid or haploid for each stage.	2
Learning Outcome: Identify the types of cellular activities that occur during G1.	3
Learning Outcome: Identify the types of cellular activities that occur during G2.	1
Learning Outcome: Identify the types of cellular activities that occur during S phase.	6
Learning Outcome: List the stages of meiosis in their proper order.	4
Learning Outcome: List the stages of mitosis in their proper order.	1
Learning Outcome: List three important purposes of cell division.	3
Section: 09.01	3
Section: 09.02	16
Section: 09.03	36
Section: 09.04	2
Section: 09.05	7
Section: 09.06	3
Section: 09.07	10
Section: 09.08	38
Section: 09.09	14
Section: 09.10	9
Topic: Cell Cycle and Mitosis	59
Topic: Meiosis	71