

chapter 20

Student: _____

1. The genetic make-up of an individual is referred to as its:
 - A.genotype
 - B.phenotype
 - C.allele
 - D.Punnett square
2. Alternate forms of a gene having the same location (locus) on a pair of chromosomes affecting the same trait are called:
 - A.genotype
 - B.phenotype
 - C.alleles
 - D.Punnett square
3. The physical appearance of an individual is referred to as its:
 - A.genotype
 - B.phenotype
 - C.allele
 - D.Punnett square
4. Choose the following letter designation for attached/unattached earlobes that represents heterozygous genotype.
 - A.EE
 - B.Ee
 - C. ee
 - D.None of the choices are correct.

5. Choose the following letter designation for attached/unattached earlobes that represents homozygous recessive genotype.
- A.EE
 - B.Ee
 - C. ee
 - D. None of the choices are correct.
6. The allele which is traditionally indicated by an uppercase (capital) letter is the:
- A. dominant allele
 - B. recessive allele
7. Alternate forms of a gene that influence the same characteristic and are found at the same location in homologous chromosomes are called:
- A. alleles
 - B. phenotypes
 - C. genotypes
 - D. prototypes
 - E. paratypes
8. Which is a characteristic of alleles?
- A. They occur in pairs on homologous chromosomes.
 - B. They separate when forming gametes.
 - C. They reoccur in pairs at fertilization.
 - D. All of the choices are correct.
9. The term 'allele' most accurately refers to:
- A. the homologous chromosomes
 - B. dominant genes
 - C. recessive genes
 - D. different forms of a gene influencing a trait

10. The letter notations A and a in genetics problems represent:

- A. characteristic phenotype of an individual
- B. allelic genotype of an individual
- C. disjunctive and separate genes
- D. chromosomal mutations

11. Which of these indicates a recessive allele?

- A. capital letters
- B. lowercase letters
- C. italicized letters
- D. letters in parentheses
- E. numbers

12. Which of these is homozygous?

- A. *AA*
- B. *aa*
- C. *Bb*
- D. both *AA* and *aa*

13. Which of these is heterozygous?

- A. *AA*
- B. *aa*
- C. *Bb*
- D. both *AA* and *aa*

14. Which gamete determines the sex of the offspring?

- A. male
- B. female
- C. both male and female
- D. it is predetermined

15. Choose the CORRECT statement concerning dominant/recessive traits.
- A. The phenotype determines the genotype.
 - B. The genotype determines the phenotype.
 - C. Offspring from both homozygous recessive parents are dominant.
 - D. Offspring from heterozygous parents are all recessive.
 - E. None of the choices are correct.
16. Choose the ratio for crossing two heterozygous parents for earlobe attachment ($Ee \times Ee$).
- A. 1:1
 - B. 2:1
 - C. 3:1
 - D. None of the choices are correct.
17. Choose the ratio for crossing a heterozygous parent for earlobe attachment and a homozygous recessive parent ($Ee \times ee$).
- A. 1:1
 - B. 2:1
 - C. 3:1
 - D. None of the choices are correct.
18. The device used in genetics to calculate the genotype and phenotype of a particular cross is called a:
- A. Rubic cube
 - B. gene matrix
 - C. dihybrid cross
 - D. Punnett square
 - E. None of the choices are correct.
19. In crossing two heterozygous parents, what are the chances for a pure recessive offspring?
- A. 75%
 - B. 50%
 - C. 25%
 - D. less than 10%
 - E. None of the choices are correct.

20. In crossing two heterozygous parents, what are the chances that an offspring will receive a dominant allele?
- A. 75%
 - B. 50%
 - C. 25%
 - D. less than 10%
 - E. None of the choices are correct.
21. In crossing a heterozygous parent and a homozygous recessive parent, what are the chances that an offspring will receive a dominant allele?
- A. 75%
 - B. 50%
 - C. 25%
 - D. less than 10%
 - E. None of the choices are correct.
22. In humans, red hair is recessive to dark hair. What are the chances of dark-haired parents having a red-haired child if each parent had one red-haired parent?
- A. 0%
 - B. 25%
 - C. 50%
 - D. 75%
 - E. 100%
23. If an albino (autosomal recessive trait) woman is married to a man with normal coloring and they have an albino child, what is the genotype of the man?
- A. homozygous dominant
 - B. heterozygous
 - C. sex-linked
 - D. homozygous recessive
24. Word descriptions such as "black" and "short-haired" represent:
- A. phenotype only
 - B. genotype only
 - C. both phenotype and genotype
 - D. neither phenotype nor genotype

25. In humans, brown eyes are dominant over blue eyes. A brown-eyed woman who has a blue-eyed child has the genotype
- A. *bb*
 - B. *Bb*
 - C. *BB*
 - D. not able to determine from given information
26. Freckles are dominant over no freckles. If a woman with freckles (homozygous) reproduces with a man with no freckles, what are the chances they will have a child with freckles?
- A. 25%
 - B. 50%
 - C. 100%
 - D. 0%
27. A woman who can roll her tongue (dominant) is married to a man who cannot. Two of their four children can roll their tongues, and two cannot. If A = roll tongue and a = cannot roll tongue, then what is the genotype of the parents?
- A. woman *aa* x man *Aa*
 - B. woman *AA* x man *aa*
 - C. woman *Aa* x man *AA*
 - D. woman *Aa* x man *aa*
28. Free earlobes are dominant over attached earlobes. If two people with attached earlobes mate, what will be the phenotype of their offspring?
- A. all free earlobes
 - B. all attached earlobes
 - C. 50/50 free to attached earlobes
 - D. 75% free, 25% attached
29. If 25% of the offspring of one set of parents show the recessive phenotype, the parents were probably:
- A. both homozygous recessive
 - B. both homozygous dominant
 - C. both heterozygous
 - D. one homozygous dominant, one homozygous recessive

30. When one trait is governed by two or more sets of alleles, this is called:
- A. polymorphism
 - B. polyploidy
 - C. polygenic inheritance
 - D. apoptosis
 - E. None of the choices are correct.
31. A 9:3:3:1 phenotypic ratio is expected from a dihybrid cross when
- A. both parents are homozygous.
 - B. both parents are heterozygous.
 - C. one parent is homozygous dominant for each trait and one parent is heterozygous for each trait.
 - D. one parent is homozygous dominant for each trait and one parent is homozygous recessive for each trait.
32. Freckles and a widows peak hairline are dominant traits. A man without freckles and a straight hairline has a child with a woman who has freckles and a straight hairline. What are the chances the child will have the same phenotype as the father?
- A. 50% if the mother is heterozygous for freckles.
 - B. 0% if the mother is homozygous for freckles.
 - C. 25% if the father is heterozygous for each trait.
 - D. either 50% or 0% depending on mother's genotype.
33. Dimples and short fingers are dominant. If a child does not have dimples and has long fingers, then both his parents must also have dimples and have long fingers.
- A. True
 - B. False
34. When a gene exists in several allelic forms, but each person has only two of the forms, this is called:
- A. polygenic inheritance
 - B. multiple alleles
 - C. codominance
 - D. sex-linked
 - E. None of the choices are correct.

35. In a paternity suit the alleged father has blood type O, the mother blood type AB, and the baby has blood type B. Choose the most accurate statement below.
- A. The alleged father must be the biological father.
 - B. The alleged father could be the biological father.
 - C. The alleged father could not be the biological father.
 - D. None of the parental blood types match the baby.
36. In a paternity suit the alleged father has blood type AB, the mother blood type O, and the baby has blood type O. Choose the most accurate statement below.
- A. The alleged father must be the biological father.
 - B. The alleged father could be the biological father.
 - C. The alleged father could not be the biological father.
 - D. None of the parental blood types match the baby.
37. When alleles are equally expressed in a heterozygote it is called:
- A. sex-linked
 - B. incomplete dominance
 - C. codominance
 - D. polygenic inheritance
 - E. multiple alleles
38. When a heterozygote has an intermediate phenotype between that of either homozygote, it is called:
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 - C. codominance
 - D. multifactorial inheritance
 - E. multiple alleles
39. Inheritance of skin color is considered polygenic. If two medium-brown individuals married ($AaBb \times AaBb$), the resulting children may be:
- A. very light
 - B. very dark
 - C. medium-brown
 - D. dark
 - E. any of the choices

40. Traits controlled by alleles on the sex chromosomes (X or Y) are said to be:
- A. sex-linked
 - B. incomplete dominance
 - C. codominance
 - D. multifactorial inheritance
 - E. multiple alleles
41. Color blindness is an X-linked genetic disorder. Choose the following genotype that represents a female with normal vision, but is a carrier of the color blind gene.
- A. $X^B X^B$
 - B. $X^B X^b$
 - C. $X^b X^b$
 - D. $X^B Y$
 - E. $X^b Y$
42. Color blindness is an X-linked genetic disorder. Choose the following genotype that represents a male who is color blind.
- A. $X^B X^B$
 - B. $X^B X^b$
 - C. $X^b X^b$
 - D. $X^B Y$
 - E. $X^b Y$
43. Color blindness is an X-linked genetic disorder. If a man with normal vision and a heterozygous woman have a daughter, what are the chances that she will be color blind?
- A. 0%
 - B. 25%
 - C. 50%
 - D. 75%
 - E. None of the choices are correct.
44. The gene which is responsible for red/green colorblindness is located on which type of chromosome?
- A. autosome
 - B. X chromosome
 - C. Y chromosome

45. In ____, one set of alleles controls the phenotype with one allele coding for a product while the other does not, giving the heterozygote an intermediate condition.
- A. multiple alleles
 - B. codominance
 - C. polygenic inheritance
 - D. incomplete dominance
46. Parents that appear normal but are capable of having a child with a genetic disorder are called:
- A. harbingers
 - B. carriers
 - C. genetic hosts
 - D. chimeras
 - E. None of the choices are correct.
47. Which of the following genetic diseases is prominent in individuals of Jewish descent?
- A. Tay-Sachs
 - B. PKU
 - C. cystic fibrosis
48. Which if the following genetic diseases results from the lack of an enzyme needed to break down the amino acid phenylalanine?
- A. Tay-Sachs
 - B. PKU
 - C. cystic fibrosis
49. Which of these characterizes PKU?
- A. inheritance of autosomal recessive alleles
 - B. inheritance of a dominant allele
 - C. inability to metabolize phenylalanine
 - D. both inheritance of autosomal recessive alleles and the inability to metabolize phenylalanine.

50. A person with the sickle-cell trait:
- A. gets this condition from one parent
 - B. has red cells that are sometimes sickle-shaped
 - C. does not need to restrict physical activity
 - D. All of the choices are correct.
51. Which disorder is characterized by a lack of the protein dystrophin?
- A. hemophilia
 - B. color blindness
 - C. muscular dystrophy
 - D. Down syndrome
 - E. cystic fibrosis
52. Which of the following is expected to be more common in male offspring than female?
- A. hemophilia
 - B. sickle-cell disease
 - C. Huntington disease
53. Which of the following is inherited as an X-linked recessive trait?
- A. Tay-Sachs
 - B. sickle cell anemia
 - C. cystic fibrosis
 - D. hemophilia
54. Hemophilia A is caused by the absence of
- A. hemoglobin
 - B. clotting factor VIII
 - C. blood plasma
 - D. dystrophin
55. Hemophilia is a(n) _____ disease.
- A. sex-linked
 - B. autosomal dominant
 - C. polygenic
 - D. autosomal recessive

chapter 20 Key

1. The genetic make-up of an individual is referred to as its:

- A genotype
- b. phenotype
- c. allele
- d. Punnett square

Mader - 020 Chapter... #1

2. Alternate forms of a gene having the same location (locus) on a pair of chromosomes affecting the same trait are called:

- a. genotype
- b. phenotype
- C alleles
- d. Punnett square

Mader - 020 Chapter... #2

3. The physical appearance of an individual is referred to as its:

- a. genotype
- B phenotype
- c. allele
- d. Punnett square

Mader - 020 Chapter... #3

4. Choose the following letter designation for attached/unattached earlobes that represents heterozygous genotype.

- a. EE
- B Ee
- c. ee
- d. None of the choices are correct.

Mader - 020 Chapter... #4

5. Choose the following letter designation for attached/unattached earlobes that represents homozygous recessive genotype.
- a. EE
 - b. Ee
 - C** ee
 - d. None of the choices are correct.

Mader - 020 Chapter... #5

6. The allele which is traditionally indicated by an uppercase (capital) letter is the:
- A** dominant allele
 - b. recessive allele

Mader - 020 Chapter... #7

7. Alternate forms of a gene that influence the same characteristic and are found at the same location in homologous chromosomes are called:
- A** alleles
 - b. phenotypes
 - c. genotypes
 - d. prototypes
 - e. paratypes

Mader - 020 Chapter... #8

8. Which is a characteristic of alleles?
- a. They occur in pairs on homologous chromosomes.
 - b. They separate when forming gametes.
 - c. They reoccur in pairs at fertilization.
 - D** All of the choices are correct.

Mader - 020 Chapter... #9

9. The term 'allele' most accurately refers to:
- a. the homologous chromosomes
 - b. dominant genes
 - c. recessive genes
 - D** different forms of a gene influencing a trait

Mader - 020 Chapter... #10

10. The letter notations A and a in genetics problems represent:
- a. characteristic phenotype of an individual
 - B** allelic genotype of an individual
 - c. disjunctive and separate genes
 - d. chromosomal mutations

Mader - 020 Chapter... #11

11. Which of these indicates a recessive allele?
- a. capital letters
 - B** lowercase letters
 - c. italicized letters
 - d. letters in parentheses
 - e. numbers

Mader - 020 Chapter... #12

12. Which of these is homozygous?
- a. AA
 - b. *aa*
 - c. *Bb*
 - D** both AA and *aa*

Mader - 020 Chapter... #13

13. Which of these is heterozygous?
- a. AA
 - b. *aa*
 - C** *Bb*
 - d. both AA and *aa*

Mader - 020 Chapter... #14

14. Which gamete determines the sex of the offspring?
- A** male
 - b. female
 - c. both male and female
 - d. it is predetermined

Mader - 020 Chapter... #15

15. Choose the CORRECT statement concerning dominant/recessive traits.
- a. The phenotype determines the genotype.
 - B** The genotype determines the phenotype.
 - c. Offspring from both homozygous recessive parents are dominant.
 - d. Offspring from heterozygous parents are all recessive.
 - e. None of the choices are correct.

Mader - 020 Chapter... #16

16. Choose the ratio for crossing two heterozygous parents for earlobe attachment ($Ee \times Ee$).
- a. 1:1
 - b. 2:1
 - C** 3:1
 - d. None of the choices are correct.

Mader - 020 Chapter... #17

17. Choose the ratio for crossing a heterozygous parent for earlobe attachment and a homozygous recessive parent ($Ee \times ee$).
- A** 1:1
 - b. 2:1
 - c. 3:1
 - d. None of the choices are correct.

Mader - 020 Chapter... #18

18. The device used in genetics to calculate the genotype and phenotype of a particular cross is called a:
- a. Rubics cube
 - b. gene matrix
 - c. dihybrid cross
 - D** Punnett square
 - e. None of the choices are correct.

Mader - 020 Chapter... #19

19. In crossing two heterozygous parents, what are the chances for a pure recessive offspring?
- a. 75%
 - b. 50%
 - C** 25%
 - d. less than 10%
 - e. None of the choices are correct.

Mader - 020 Chapter... #20

20. In crossing two heterozygous parents, what are the chances that an offspring will receive a dominant allele?
- A** 75%
 - b. 50%
 - c. 25%
 - d. less than 10%
 - e. None of the choices are correct.

Mader - 020 Chapter... #21

21. In crossing a heterozygous parent and a homozygous recessive parent, what are the chances that an offspring will receive a dominant allele?
- a. 75%
 - B** 50%
 - c. 25%
 - d. less than 10%
 - e. None of the choices are correct.

Mader - 020 Chapter... #22

22. In humans, red hair is recessive to dark hair. What are the chances of dark-haired parents having a red-haired child if each parent had one red-haired parent?
- a. 0%
 - B** 25%
 - c. 50%
 - d. 75%
 - e. 100%

Mader - 020 Chapter... #23

23. If an albino (autosomal recessive trait) woman is married to a man with normal coloring and they have an albino child, what is the genotype of the man?
- a. homozygous dominant
 - B** heterozygous
 - c. sex-linked
 - d. homozygous recessive

Mader - 020 Chapter... #24

24. Word descriptions such as "black" and "short-haired" represent:
- A** phenotype only
 - b. genotype only
 - c. both phenotype and genotype
 - d. neither phenotype nor genotype

Mader - 020 Chapter... #25

25. In humans, brown eyes are dominant over blue eyes. A brown-eyed woman who has a blue-eyed child has the genotype
- a. *bb*
 - B** *Bb*
 - c. *BB*
 - d. not able to determine from given information

Mader - 020 Chapter... #26

26. Freckles are dominant over no freckles. If a woman with freckles (homozygous) reproduces with a man with no freckles, what are the chances they will have a child with freckles?
- a. 25%
 - b. 50%
 - C** 100%
 - d. 0%

Mader - 020 Chapter... #27

27. A woman who can roll her tongue (dominant) is married to a man who cannot. Two of their four children can roll their tongues, and two cannot. If A = roll tongue and a = cannot roll tongue, then what is the genotype of the parents?
- a. woman *aa* x man *Aa*
 - b. woman *AA* x man *aa*
 - c. woman *Aa* x man *AA*
 - D** woman *Aa* x man *aa*

Mader - 020 Chapter... #28

28. Free earlobes are dominant over attached earlobes. If two people with attached earlobes mate, what will be the phenotype of their offspring?
- a. all free earlobes
 - B** all attached earlobes
 - c. 50/50 free to attached earlobes
 - d. 75% free, 25% attached

Mader - 020 Chapter... #29

29. If 25% of the offspring of one set of parents show the recessive phenotype, the parents were probably:
- a. both homozygous recessive
 - b. both homozygous dominant
 - C** both heterozygous
 - d. one homozygous dominant, one homozygous recessive

Mader - 020 Chapter... #30

30. When one trait is governed by two or more sets of alleles, this is called:
- a. polymorphism
 - b. polyploidy
 - C** polygenic inheritance
 - d. apoptosis
 - e. None of the choices are correct.

Mader - 020 Chapter... #31

31. A 9:3:3:1 phenotypic ratio is expected from a dihybrid cross when
- a. both parents are homozygous.
 - B** both parents are heterozygous.
 - c. one parent is homozygous dominant for each trait and one parent is heterozygous for each trait.
 - d. one parent is homozygous dominant for each trait and one parent is homozygous recessive for each trait.

Mader - 020 Chapter... #33

32. Freckles and a widows peak hairline are dominant traits. A man without freckles and a straight hairline has a child with a woman who has freckles and a straight hairline. What are the chances the child will have the same phenotype as the father?
- a. 50% if the mother is heterozygous for freckles.
 - b. 0% if the mother is homozygous for freckles.
 - c. 25% if the father is heterozygous for each trait.
 - D** either 50% or 0% depending on mother's genotype.

Mader - 020 Chapter... #34

33. Dimples and short fingers are dominant. If a child does not have dimples and has long fingers, then both his parents must also have dimples and have long fingers.
- a. True
 - B** False

Mader - 020 Chapter... #35

34. When a gene exists in several allelic forms, but each person has only two of the forms, this is called:
- a. polygenic inheritance
 - B** multiple alleles
 - c. codominance
 - d. sex-linked
 - e. None of the choices are correct.

Mader - 020 Chapter... #36

35. In a paternity suit the alleged father has blood type O, the mother blood type AB, and the baby has blood type B. Choose the most accurate statement below.
- a. The alleged father must be the biological father.
 - B** The alleged father could be the biological father.
 - c. The alleged father could not be the biological father.
 - d. None of the parental blood types match the baby.

Mader - 020 Chapter... #41

36. In a paternity suit the alleged father has blood type AB, the mother blood type O, and the baby has blood type O. Choose the most accurate statement below.
- a. The alleged father must be the biological father.
 - b. The alleged father could be the biological father.
 - C** The alleged father could not be the biological father
 - d. None of the parental blood types match the baby.

Mader - 020 Chapter... #42

37. When alleles are equally expressed in a heterozygote it is called:
- a. sex-linked
 - b. incomplete dominance
 - C** codominance
 - d. polygenic inheritance
 - e. multiple alleles

Mader - 020 Chapter... #44

38. When a heterozygote has an intermediate phenotype between that of either homozygote, it is called:
- a. sex-linked
 - B** incomplete dominance
 - c. codominance
 - d. multifactorial inheritance
 - e. multiple alleles

Mader - 020 Chapter... #45

39. Inheritance of skin color is considered polygenic. If two medium-brown individuals married ($AaBb \times AaBb$), the resulting children may be:
- a. very light
 - b. very dark
 - c. medium-brown
 - d. dark
 - E** any of the choices

Mader - 020 Chapter... #48

40. Traits controlled by alleles on the sex chromosomes (X or Y) are said to be:
- A** sex-linked
 - b. incomplete dominance
 - c. codominance
 - d. multifactorial inheritance
 - e. multiple alleles

Mader - 020 Chapter... #54

41. Color blindness is an X-linked genetic disorder. Choose the following genotype that represents a female with normal vision, but is a carrier of the color blind gene.
- a. $X^B X^B$
 - B** $X^B X^b$
 - c. $X^b X^b$
 - d. $X^B Y$
 - e. $X^b Y$

Mader - 020 Chapter... #55

42. Color blindness is an X-linked genetic disorder. Choose the following genotype that represents a male who is color blind.
- a. $X^B X^B$
 - b. $X^B X^b$
 - c. $X^b X^b$
 - d. $X^B Y$
 - E** $X^b Y$

Mader - 020 Chapter... #56

43. Color blindness is an X-linked genetic disorder. If a man with normal vision and a heterozygous woman have a daughter, what are the chances that she will be color blind?
- A 0%
 - b. 25%
 - c. 50%
 - d. 75%
 - e. None of the choices are correct.

Mader - 020 Chapter... #57

44. The gene which is responsible for red/green colorblindness is located on which type of chromosome?
- a. autosome
 - B X chromosome**
 - c. Y chromosome

Mader - 020 Chapter... #64

45. In ____, one set of alleles controls the phenotype with one allele coding for a product while the other does not, giving the heterozygote an intermediate condition.
- a. multiple alleles
 - b. codominance
 - c. polygenic inheritance
 - D incomplete dominance**

Mader - 020 Chapter... #67

46. Parents that appear normal but are capable of having a child with a genetic disorder are called:
- a. harbingers
 - B carriers**
 - c. genetic hosts
 - d. chimeras
 - e. None of the choices are correct.

Mader - 020 Chapter... #70

47. Which of the following genetic diseases is prominent in individuals of Jewish descent?
- A** Tay-Sachs
 - b. PKU
 - c. cystic fibrosis

Mader - 020 Chapter... #71

48. Which if the following genetic diseases results from the lack of an enzyme needed to break down the amino acid phenylalanine?
- a. Tay-Sachs
 - B** PKU
 - c. cystic fibrosis

Mader - 020 Chapter... #73

49. Which of these characterizes PKU?
- a. inheritance of autosomal recessive alleles
 - b. inheritance of a dominant allele
 - c. inability to metabolize phenylalanine
 - D** both inheritance of autosomal recessive alleles and the inability to metabolize phenylalanine.

Mader - 020 Chapter... #74

50. A person with the sickle-cell trait:
- a. gets this condition from one parent
 - b. has red cells that are sometimes sickle-shaped
 - c. does not need to restrict physical activity
 - D** All of the choices are correct.

Mader - 020 Chapter... #76

51. Which disorder is characterized by a lack of the protein dystrophin?
- a. hemophilia
 - b. color blindness
 - C** muscular dystrophy
 - d. Down syndrome
 - e. cystic fibrosis

Mader - 020 Chapter... #88

52. Which of the following is expected to be more common in male offspring than female?

- A** hemophilia
- b. sickle-cell disease
- c. Huntington disease

Mader - 020 Chapter... #91

53. Which of the following is inherited as an X-linked recessive trait?

- a. Tay-Sachs
- b. sickle cell anemia
- c. cystic fibrosis
- D** hemophilia

Mader - 020 Chapter... #92

54. Hemophilia A is caused by the absence of

- a. hemoglobin
- B** clotting factor VIII
- c. blood plasma
- d. dystrophin

Mader - 020 Chapter... #93

55. Hemophilia is a(n) _____ disease.

- A** sex-linked
- b. autosomal dominant
- c. polygenic
- d. autosomal recessive

Mader - 020 Chapter... #97

chapter 20 Summary

<i>Category</i>	<i># of Questions</i>
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