Mendel and Heredity

Chapter 8

1. Heredity is ____.

    a. It has been known about since ______________________________

    b. it was first used in ____________________________________

2. The mechanism of heredity wasn't understood until the work of ____________

_______________________.

3. Mendel is considered the father of ______________________________.

    a. genetics is ____

    ____

4. Mendel repeated the work of a British farmer named _____________________

and experimented on _____________________.

5. The reason Mendel was more successful than others who had studied heredity is

    a. ____

    b. ____

6. The pea was a great specimen for genetics experiments because

    a. They have 2 different forms of traits

    Explain: ____

    ____

    ____

    ____

b. The experimenter can control breeding

Explain ____

____

____

____

c. Peas are

1. ____

2. ____

3. ____

4. ____

HOW MENDEL DID HIS EXPERIMENT

7. Monohybrid cross ____

____

Example ______________________ x ___________________________

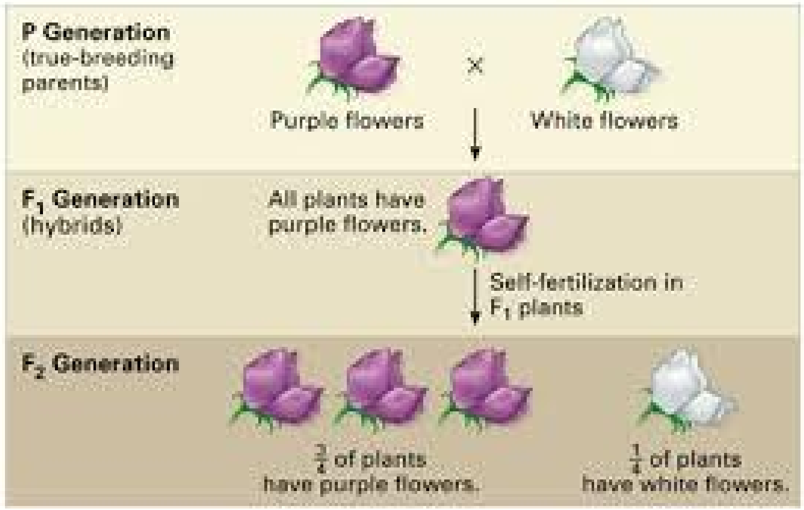
8. True breeding is ____

____

9. P generation is ____

10. F1 generation is ____

11. F2 generation is ____



12. Step 1: ____

____

____

13. Step 2:____

____

____

14. Step 3: ____

____

____

Mendel's Results

15. Mendel found that in the F1 generation _____________________________

____

16. In the F2 generation the trait that disappeared in the F1 reappeared in a ___________ ratio.

17. A ratio is ____

18. Ratios are written in 3 ways

a. _______________________

b. _______________________

c. ________________________

SECTION 2

19. Based on his experiments, Mendel formed 4 hypotheses

a. For every trait an individual has ___ genes one from the __________

and 1 from the ____________________.

b. There are alternate versions of genes called ___________________

Example: For flower color there is a version of gene for __________

flowers and a version of a gene for __________ flowers

c. When an individual gets 2 alleles one is ________________ and one is

__________________________.

1. dominant ____

2. recessive ____

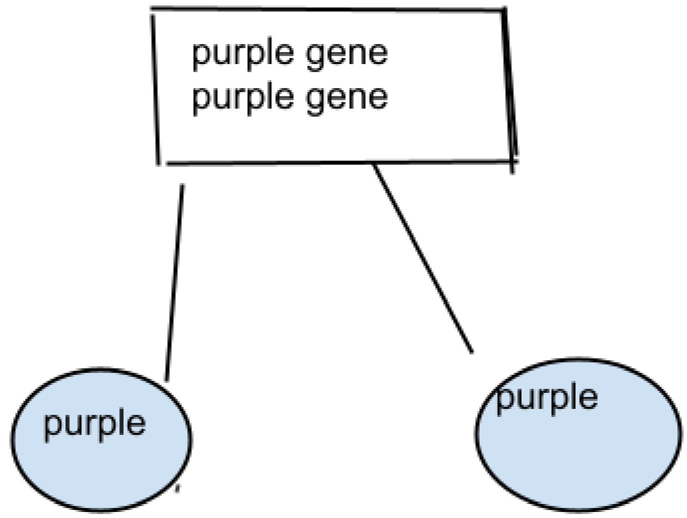
Example Purple flowered plant x white flowered plant. All babies are purple

___________________ is dominant

___________________ is recessive

d. When ___________________ are formed the genes for a trait separate.

Example: Individual has 2 genes for purple flower color



20. In genetics letters are used to represent alleles

a. ______________________ represent dominant alleles

b. _____________________ represent recessive alleles

Example:

Brown is dominant _____________

Blue is recessive _______________

21. _______________ is when an individual has 2 of the same allele for a trait.

Example: _______ or ________

22. _____________________ is when an individual has 2 different alleles for a trait

Example: __________

23. _______________________ is the alleles or genes an individual has for a trait (the letters)

24. _______________________ is the physical characteristics an individual has for a trait as a result of their genes (what they look like

25. Example:

Taster is dominant: _____

Non-taster is recessive ____

Bob is a nontaster.

His genotype is __________.

His phenotype is __________.

Sally is a heterozygous taster.

Her genotype is ___________.

Her phenotype is _________________.

26. Based on Mendel's experiment ______ laws of heredity were formed

A. Law of segregation _______________________________________

____

B. Law of independent assortment ____________________________

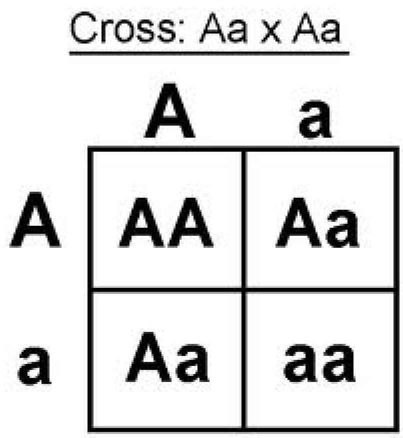
____

____

SECTION 3

27. There is a need in genetics to predict the ______________ of a cross.

28. A ____________________________ is a tool used to predict offspring



29. STEPS TO MAKING A PUNNETT SQUARE

1. Make a key showing what trait is __________________ and what trait is ______________________.

2. Determine the ___________________ for each parent

3. Separate the __________________, this is what goes in each gamete

4. Place the gamete possibilities for one parent on the _________ of each column of punnett square

5. Place the gamete possibilities for the 2nd parent on the _____________ side of each row.

6. Combine the _________________ for each trait together in the inside boxes

7. Determine the ___________________________ and

______________________________ ratio of the cross.

30. Example: In peas, yellow seeds are dominant to green seeds. Do a punnett square for a heterozygous yellow plant crossed with a homozygous yellow plant.

Step 1: Key

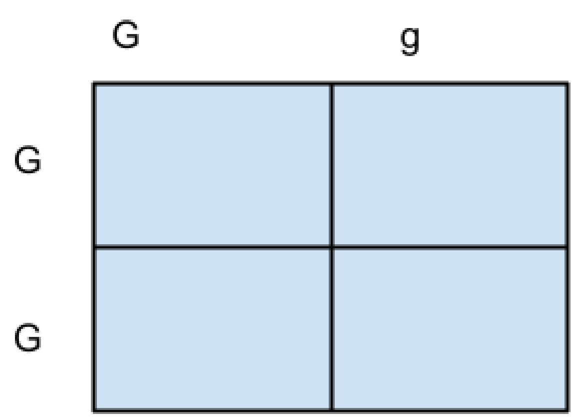
G = ____________

g = _____________

Step 2:

Parent 1 Genotype ________________

Parent 2 Genotype ________________



Step 6:

Genotypic ratio

GG: Gg: gg

___: ___: ____

Phenotypic ratio

Green: Yellow

______: _______

Example: Sickle cell anemia is a recessive trait. Being healthy is dominant. John is heterozygous for sickle cell. Sue is heterozygous for sickle cell. Do a punnett square for John and Sue

Key:

Healthy: ______________

Sickle cell: _______________

John's genotype: _____________

Sue's genotype: ________________

Genotypic Ratio

Phenotypic Ratio

31. A ________________________ is a cross that looks at 2 traits instead of 1

32. It has __________ boxes in the punnett square instead of ____. It uses the same steps as a monohybrid cross

33. Example: In peas, yellow seeds are dominant to green. Tall plants are dominant to short plants. Do the cross of a heterozygous yellow heterozygous tall plant, with a heterozygous yellow, heterozygous tall plant.

Step 1:

Tall = _________ Short = _________

Yellow = ______ Green = _________

Step 2: Parent 1 genotype: __________________

Parent 2 genotype: ___________________

To Figure Out Gamete Possibilities

FOIL

AaBb

F_______________________

O ______________________

I ____________________

L ___________________

	GT	Gt	gT	gt
GT	GGTT			
Gt				
gT				
gt				

Step 6:

Genotypic ratio: Do with monohybrid cross but not dihybrid crosses

Step 7:

Phenotypic ratio

Green Tall: Green Short: Yellow Tall: Yellow Short

_______: _________: _________: _________

34. When looking at an individual with the __________ trait we don't know if they are

_______________________ or _______________________.

35. A ______________________ is a cross done to determine if they are

____________________________ or _______________________.

36. A testcross is ALWAYS done by crossing a dominant individual with an unknown genotype

with a ________________________ individual

37. If all the resulting offspring are dominant, we assume the parent is

____

38. If some of the babies are recessive we know the dominant parent is

__________________________________.

39. Example: Mendel found a purple pea plant growing in his garden. He was unsure if it was homozygous or heterozygous so he crossed it with a white plant. The cross resulted in 412 purple plants and 200 white plants. The purple plant is _________________. Do a punnett square to prove this

40. Pedigrees are ____

____

41. It shows family members that have a _______________ or don't have ____________.

42. Symbols used in pedigree

males: __________________ females: __________________

have a trait: ________________ lack a trait: ________________

are carriers for a trait: ________________

43. By looking at a pedigree, geneticists can determine whether a trait is

______________________, ______________________, or __________________________

44. A sex linked trait is carried on a ______________________________

45. Sex -linked genes are usually carried on the _____________ chromosome

46. Because it's on the ___________ chromosome, _______________ are affected more than

____

47. The reason for this is _______________________________________

____

48. Example: Hemophilia is a sex linked trait. Bob is a normal male he married Sue, a woman who is a carrier for hemophilia. Complete the punnett square

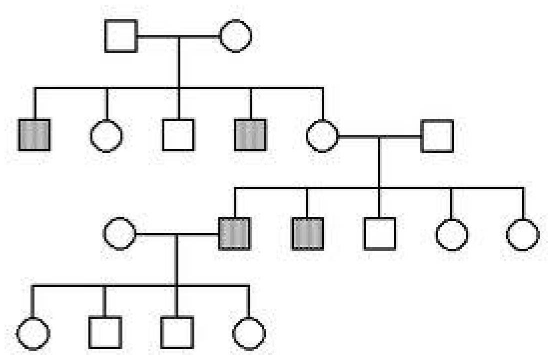
Phenotypic ratio

Hemophilia: Healthy

_______: _______

49. A pedigree of a sex-linked trait would appear like _____________________

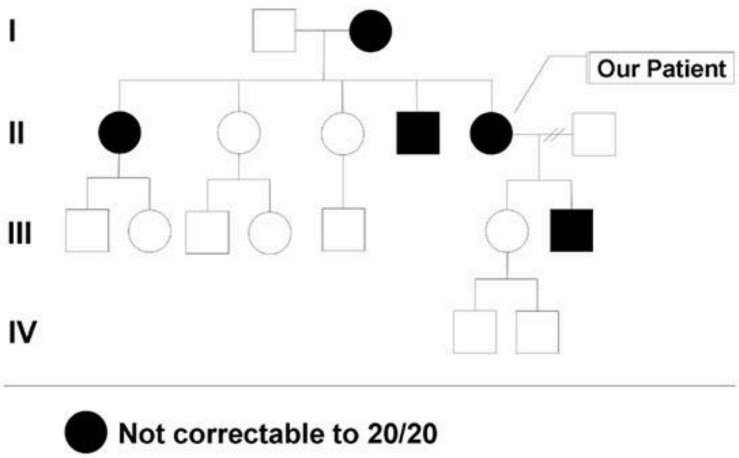
____



50. A dominant trait is carried on _________________________. An individual needs only _____________________ to have the trait.

51. A pedigree of a dominant trait would appear like _____________________

____

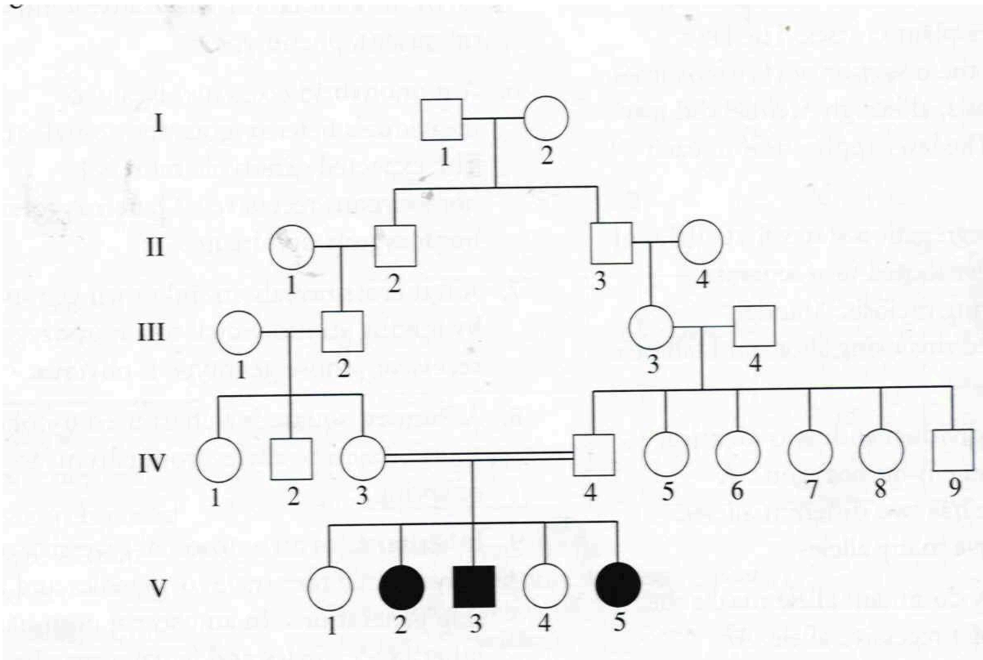


52. A recessive trait is carried on ____________________________.

53. An individual needs _____________________ of the gene to have the trait.

54. A pedigree would appear like _______________________________________

____



SECTION 4

55. Most of the time traits have _______________ patterns of inheritance.

56. This means the genes aren't _____________________ or ________________

57. Some types of complex patterns of inheritance;

A. __________________________________

B. __________________________________

C. __________________________________

D. __________________________________

E. __________________________________

58. __________________________________ is when several genes influence a trait.

59. Example: Eye color

HERC2	GEY	PHENOTYPE

BB	GG	BROWN
BB	Gg	BROWN
BB	gg	BROWN
Bb	GG	BROWN
Bb	Gg	BROWN
Bb	gg	BROWN
bb	GG	GREEN
bb	Gg	GREEN
bb	gg	BLUE

HERC2- Produce large quantities of melanin _______ or no melanin ______

Gey gene- if you have this you produce small quantities of melanin ________ or none _______.

60. ____________________________________ is when the heterozygous individual is an intermediate between the two homozygous

Example : RR: _______________, WW_____________, RW _____________

If you cross 2 pinks

Red: Pink: White

_____ ______ ______

61. ___________________________ is when the heterozygous offspring have both traits.

62. Example a _____________ cow X _______________ bull

Offspring are _______________________ (red and white)

63. Punnett square

R = ____________W = ______________ RW = _______________

Cross Red with White

Phenotypic ratio

Roan: Red: White

_____: _____: _____

64. ______________________________ is when there are more than 2 alleles for a trait.

Example: Blood typing

______= A antigens on the outside of red blood cell

_____ = B antigens on the outside of red blood cell

_____ = no antigens on the outside of red blood cell

65. ______________ and _______________ are codominant meaning

____

66. ________________ is recessive to _____________ and ______________.

67.

Genotype	Phenotype
	A
	A
	B
	B
	AB
	O

Punnett square. Cross a heterozygous A with a heterozygous B

Phenotypic Ratio

A: AB: B: O

_____   _____   ______ ______

68. The ________________________ can influence genetic traits.

69. Different environmental factors that can influence genetic traits include

a. _____________________

b. ______________________

c. ________________________

70. Example of pH

___________________ with same genotype in acidic soil appear _______________ and in basic soil appear _________________

71. Example of temperature

An ______________________keeps the same genes but fur color changes based on temperature

A. During summer the gene for an enzyme is activated at higher temperature this causes the foxes fur to ________________________

____

B. During winter the gene for an enzyme is not activated at cooler temperatures, this causes the foxes fur to ______________________

____

72. Example of Height

A. A person's genes help determine how tall they are suppose to be

if a person has good nutrition as a baby and child _______________

____

B. If a person has poor nutrition as a baby and child _______________

____

73. In order for your body to function properly it is essential for _____________

to be made and work properly

74. ____________________ have the directions for making proteins.

75. If proteins aren't made or are made improperly ______________________

and ___________________________ sometimes occur.

76. Some Genetic disorders:

A. ________________________ D. ________________________

B. _________________________ E. _________________________

C. ________________________ F. __________________________

87. Gene therapy is ____

____

88. __________________ are used to insert healthy genes into the person with the disorder.

89. Problems with using viruses is

A. ____

B. ____