Mendel's laws

Name: _____ **Date:** _____

1. Garden pea plants can have yellow seeds or green seeds. In a pea plant that is heterozygous for seed color, the allele for yellow seeds masks the effects of the allele for green seeds.

   Which of the following terms best describes the allele for yellow seeds?

   A. codominant
   B. dominant
   C. recessive
   D. sex-linked

2. Which of the following crosses does *not* follow Mendel's law of segregation?

   A. Two tall pea plants (**Tt** × **Tt**) are expected to produce some tall offspring plants.
   B. Two tall pea plants (**Tt** × **Tt**) are expected to produce some short offspring plants.
   C. A tall pea plant and a short pea plant (**Tt** × **tt**) are expected to produce all tall offspring plants.
   D. A tall pea plant and a short pea plant (**TT** × **tt**) are expected to produce all tall offspring plants.

3. Which of the following characteristics is a lion *least likely* to pass on to its offspring?

   A. colors of its fur
   B. length of its tail
   C. scars on its leg
   D. size of its body

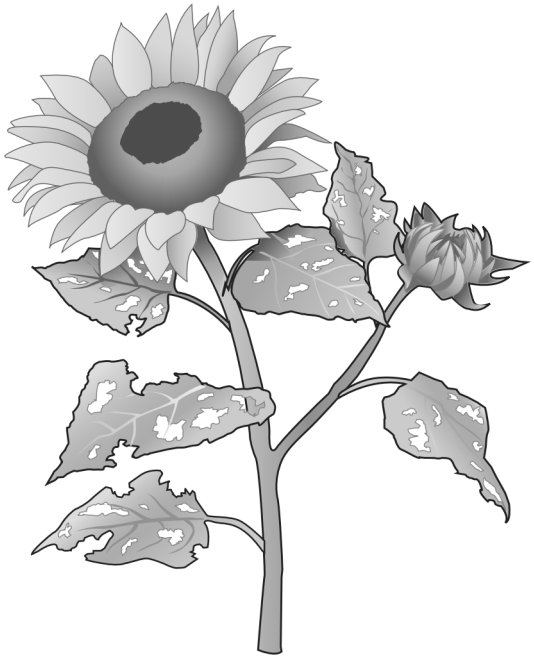
4. The table below shows the genotypes that result in four different blood types in humans.

Genotype	Blood Type
$\mathbf{I^AI^A}$, $\mathbf{I^Ai}$	A
$\mathbf{I^BI^B}$, $\mathbf{I^Bi}$	B
$\mathbf{I^AI^B}$	AB
ii	O

   Based on the information in the table, which of the following describes alleles $\mathbf{I^A}$ and $\mathbf{I^B}$?

   A. The $\mathbf{I^A}$ and $\mathbf{I^B}$ alleles show sex linkage.
   B. The $\mathbf{I^A}$ allele is recessive to the $\mathbf{I^B}$ allele.
   C. The $\mathbf{I^A}$ allele is dominant to the $\mathbf{I^B}$ allele.
   D. The $\mathbf{I^A}$ and $\mathbf{I^B}$ alleles show codominance.

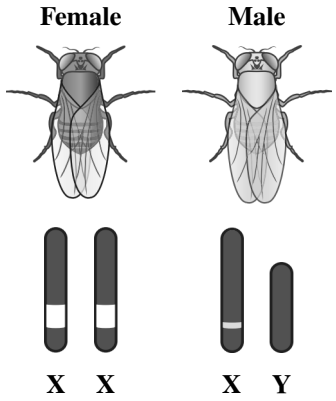
5. Rayna is collecting seeds from a sunflower. She notices that most of the leaves on the sunflower plant have patterns of holes made by chewing insects, as shown in the picture below.



Next year, she will plant the sunflower seeds that she has collected. How many of the sunflower plants that grow are expected to inherit the chewed leaf pattern?

A. all of the plants
B. most of the plants
C. half of the plants
D. none of the plants

6. The diagram below shows the X chromosomes in a female fruit fly and the X and Y chromosomes in a male fruit fly.



The two fruit flies are crossed with each other. The female offspring of the fruit flies will receive which pair of chromosomes?

A. 
B. 
C. 
D. 

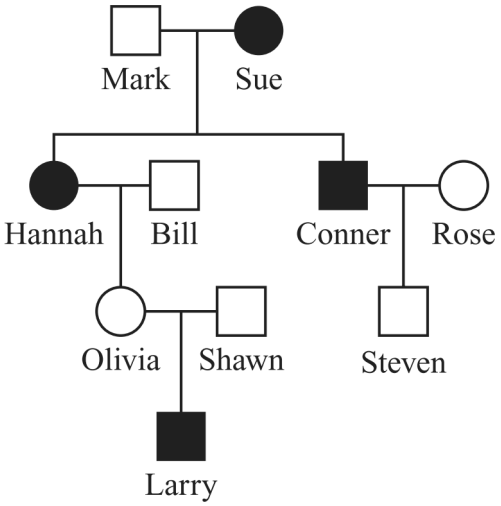
The following section focuses on a hereditary blood disease.

Read the information below and use it to answer the question(s) that follow(s).

In the blood, the protein hemoglobin can slowly convert to a different form. This other form, called methemoglobin, is normally converted back to hemoglobin by an enzyme.

In a rare blood disease called hereditary methemoglobinemia (met-H), methemoglobin is not converted back to hemoglobin. People with type 1 met-H lack the enzyme necessary for converting methemoglobin back to hemoglobin because of a gene mutation. As a result, methemoglobin builds up in the blood and makes the skin and mucous membranes look blue. Type 1 met-H does not usually affect a person's health in any other way, and daily doses of vitamin C or methylene blue convert the methemoglobin back to hemoglobin.

The pedigree for a family with a history of type 1 met-H is shown below. The pattern of inheritance for this form of met-H is autosomal recessive (allele **m**).



Key			
	Unaffected male		Male with type 1 met-H
	Unaffected female		Female with type 1 met-H

7. Larry is treated for type 1 met-H with vitamin C, and his skin no longer looks blue.

   Which of the following statements describes how this affects the likelihood of Larry passing on the allele for type 1 met-H to his offspring?

   A. Larry will now pass on a normal allele to his offspring.

   B. Larry will still pass on an allele for type 1 met-H to his offspring.

   C. Larry will only pass on an allele for type 1 met-H if his offspring is male.

   D. Larry will have less of a chance of passing on an allele for type 1 met-H to his offspring.

8. A particular genetic disorder leads to very high levels of blood cholesterol. The gene linked to this trait has two alleles, **N** and **n**. The table below shows how the three different combinations of these alleles are expressed.

Genotype	Expressed Phenotype
NN	normal cholesterol levels
Nn	slightly elevated cholesterol levels
nn	greatly elevated cholesterol levels

   Which of the following statements describes the interaction of the **N** and **n** alleles for the gene?

   A. The **N** allele is recessive to the **n** allele.

   B. The **N** allele is incompletely dominant to the **n** allele.

   C. The **N** allele assorts independently from the **n** allele.

   D. The **N** allele completely masks the phenotype of the **n** allele.

9. In a plant called jimsonweed, flowers can be white or purple. A jimsonweed plant with white flowers is crossed with a jimsonweed plant with purple flowers. All of the offspring have purple flowers.

   Based on the results of the cross, which of the following statements most likely describes the alleles for flower color in jimsonweed?

   A. The allele for purple flowers is recessive to the allele for white flowers.

   B. The allele for purple flowers is dominant to the allele for white flowers.

   C. The allele for purple flowers has mutated more times than the allele for white flowers.

   D. The allele for purple flowers is on a different chromosome than the allele for white flowers.

10. Which of the following laws or principles states that the two alleles of a gene pair separate during gamete formation?

    A. law of segregation

    B. principle of linkage

    C. principle of dominance

    D. law of independent assortment

11. Which of these would have the same degree of genetic similarity as organisms cloned from the same DNA?

A. fraternal twins

B. identical twins

C. father and son

D. mother and daughter

12. Use the information and the Punnett square below to answer the question(s).

In guinea pigs, the allele for black fur (B) is dominant. The allele for brown fur (b) is recessive. Two guinea pigs were crossed as shown in the Punnett square below.

	B	b
B	BB	Bb
B	BB	Bb

Which of these describes the phenotypes of the parent guinea pigs?

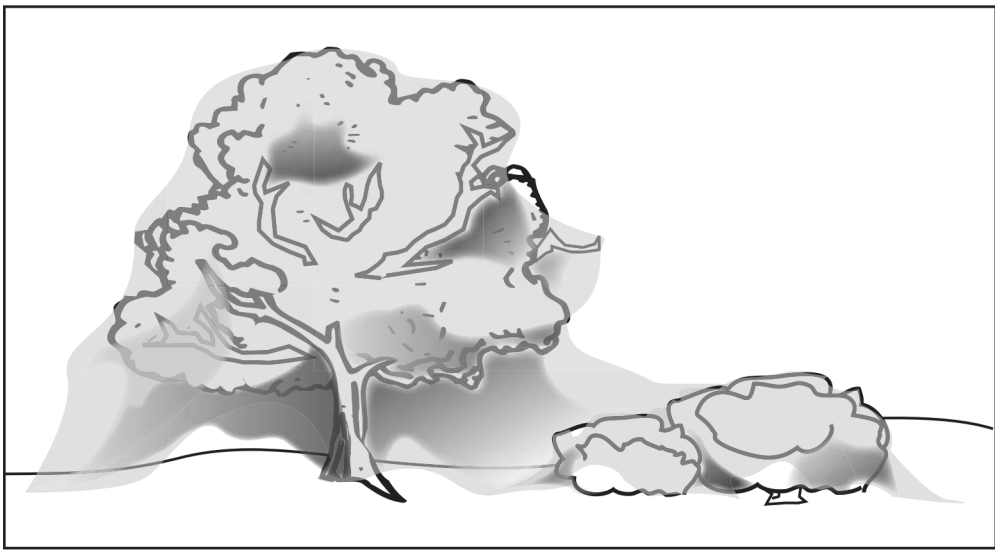
A. Both parents have black fur.

B. Both parents have brown fur.

C. One parent has black fur, and the other has brown fur.

Use the passage below to answer the following question(s).

Giant Spider Web Envelops Texas Park



Entomologists[1] are debating the origin and rarity of a sprawling spider web that blankets several trees, shrubs and the ground along a 200-yard stretch of trail in a North Texas park.

Officials at Lake Tawakoni State Park say the massive mosquito trap is a big attraction for some visitors, while others will not go anywhere near it.

"At first, it was so white it looked like fairyland," said Donna Garde, superintendent [2] of the park about 45 miles east of Dallas. "Now it's filled with so many mosquitoes that it's turned a little brown. There are times you can literally hear the screech of millions of mosquitoes caught in those webs."

Spider experts say the web may have been constructed by social cobweb spiders, which work together, or could be the result of a mass dispersal in which the arachnids [3] spin webs to spread out from one another.

"I've been hearing from entomologists from Ohio, Kansas, British Columbia—all over the place," said Mike Quinn, an invertebrate biologist with the Texas Parks and Wildlife Department who first posted photos online.

Herbert A. "Joe" Pase, a Texas Forest Service entomologist, said the massive web is very unusual.

"From what I'm hearing it could be a once-in-a-lifetime event," he said.

But John Jackman, a professor and extension entomologist for Texas A&M University, said he hears reports of similar webs every couple of years.

"There are a lot of folks that don't realize spiders do that," said Jackman, author of "A Field Guide to the Spiders and Scorpions of Texas."

"Until we get some samples sent to us, we really won't know what species of spider we're talking about," Jackman said.

Garde invited the entomologists out to the park to get a firsthand look at the giant web.

"Somebody needs to come out that's an expert. I would love to see some entomology intern come out and study this," she said.

Park rangers said they expect the web to last until fall, when the spiders will start dying off.

[1]**entomologists** – scientists who study insects
[2]**superintendent** – person in charge
[3]**arachnids** – class of animals that includes spiders, mites, and ticks

13. The brown body color of the social cobweb spider is

A. learned from parents

B. selected by the offspring

C. caused by the environment

D. inherited from parents to offspring

14. Matt is a tall, eleven-year-old boy. He has a scar on his right cheek. He is intelligent and an excellent drummer.

Which of his traits did he *most likely* inherit?

A. his height

B. his scar on his right cheek

C. his intelligence

D. his ability to play the drums

15. Which are examples of inherited traits?

A. specific beliefs B. fingerprints

C. memories D. nose shape

16. Which trait do children *most likely* inherit from their parents?

A. shape of earlobes B. musical ability

C. personality D. language

17. Tigers and household cats are members of the same family; however, their sizes are vastly different. What is the cause of this difference?

A. biochemical makeup

B. behavioral makeup

C. genetics

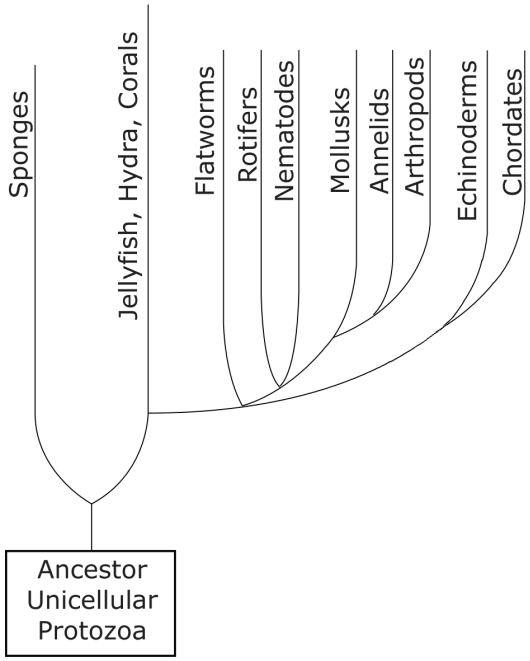
D. habitat size

18. Which deals with the transmission of inherited traits from one generation to another?

A. anatomy B. genetics

C. ecology D. forensics

19. The diagram below shows a phylogenetic tree for animals.



Which two groups of organisms have the *most* genetic differences?

A. rotifers and nematodes

B. mollusks and annelids

C. mollusks and arthropods

D. echinoderms and chordates

20. Which statement *best* describes which traits a child inherits from its parents?

A. A child only inherits traits from its father.

B. A child only inherits traits from its mother.

C. A child inherits traits from both its mother and father.

21. A child has blue eyes, but both of her parents have brown eyes. What can *best* be concluded from this statement?

A. Eye color is not an inherited trait.

B. The child has other biological relatives with blue eyes.

C. The eyes of the child changed from brown to blue.

22. A baby bird is removed from its nest at birth and raised by humans. When it gets older, the bird is able to build a nest similar to the one built by its parents. What causes the bird to have the ability to build a similar nest?

A. It learned the ability from those who raised it.

B. Its ability was inherited from the parent birds.

C. It watched other birds create their nests.

23. What explains why children often look similar to their parents?

A. Children live in the same environment as their parents.

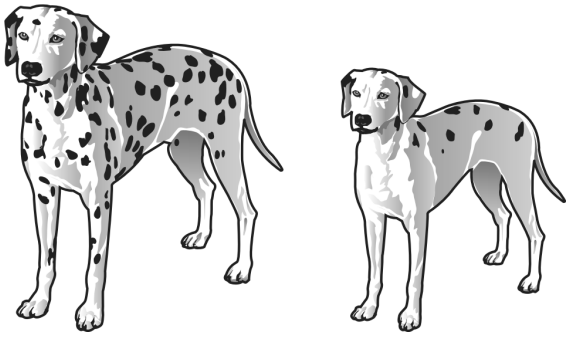
B. Children eat the same foods as their parents.

C. Children have some of the genetic traits of their parents.

24. Which is the *best* example of a trait that is inherited?

A. hair texture
B. musical talent
C. weight

25. The picture below shows two dogs that belong to the same owner.



Which statement *best* explains why one dog could have given birth to the other dog?

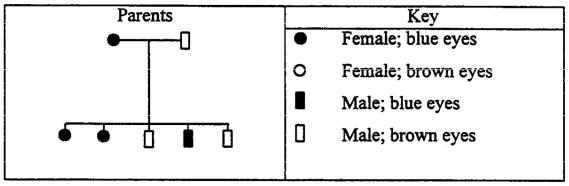
A. They are different sizes.
B. They are kept by the same person.
C. They have different characteristics.
D. They have some similar characteristics.

26. The picture below shows two mature plants.

The two plants were cross-pollinated and each plant produced seeds. Which statement *most* likely describes a characteristic of the offspring that will grow from the seeds produced by each plant?

A. The offspring will grow taller than the parent plants.
B. The offspring will have healthier leaves than the parent plants.
C. The offspring will produce fewer flowers than the parent plants.
D. The offspring will have light-colored flowers like the parent plants.

27. Two parents, one with blue eyes and one with brown eyes, have five (5) children. Some of the children have blue eyes and some have brown eyes, as shown in the diagram below.



Why don't all the children have the same eye color?

A. Eye color is determined by one parent only.

B. Eye color is determined by the sex of the child.

C. Eye color is determined by a combination of both parents.

D. Eye color is completely random in humans.

28. Some people have the ability to bend their thumbs back, as shown in the picture below.

Which statement *best* explains why the ability to bend the thumb back is an example of an inherited trait?

A. Some people can be taught how to bend their thumbs back by watching other people bend their thumbs back.

B. Some people can train their thumbs to bend back by stretching them back many times.

C. Some people can bend their thumbs back without having to learn how to bend them back.

D. Some people can bend their thumbs back when they are around other people who can bend their thumbs back.

29. Which situation is an example of an animal behavior that is *not* passed on genetically to the offspring of the animal?

A. a salmon swimming upstream to spawn

B. a squirrel moving toward a person to get food

C. a bird migrating to a warmer climate for winter

D. a baby turtle moving toward water after hatching

30. Genes are unable to determine a person's

A. eye color.
B. athletic ability.
C. number of teeth.
D. shape of earlobes.

31. If Jessica has light eyes (*bb*) and both of her parents have dark eyes (*Bb*) which statement is true?

A. Jessica inherited both genes from her father.
B. Jessica inherited both genes from her mother.
C. Jessica inherited one recessive form of the gene from each parent.
D. Jessica inherited one dominant form of the gene from each parent.

32. Which statement about the genetic traits of humans is true?

A. Recessive forms of genes are always visible in offspring.
B. Visible traits are the same for each member of a family.
C. Dominant forms of genes are always inherited from both parents.
D. Visible traits depend on the dominant and recessive forms of genes from each parent.

33. Steven went to a farm and picked a bright red tomato from a broken branch on the plant. The tomato had a rotten spot with a worm inside of it. Instead of eating the tomato, Steven decided to plant the seeds and grow new tomato plants.

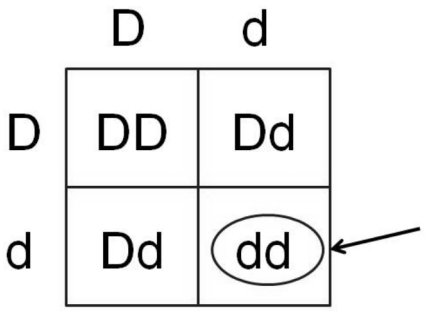
Which characteristic of the tomato plant is inherited and could change over several generations?

A. color of the skin
B. size of rotten spots
C. length of worms inside
D. number of broken branches

34. How did the work of Gregor Mendel change the scientific explanation about how traits were inherited?

A. Mendel showed that every trait is controlled by two inherited elements.
B. Mendel showed that an organism contains miniature forms of its future offspring.
C. Mendel showed that traits skip a generation and are inherited grandparent to grandchild.
D. Mendel showed that tiny particles from every part of the body of each parent became blended and produced an individual with the characteristics of both.

35. The figure below shows a Punnet Square for an inherited trait.



The arrow is pointing to a circled genotype in the square. What genotype does the circled "dd" represent?

A. the genotype in the mother's egg

B. the genotype that only the girls will inherit

C. the genotype that any of the children could inherit

D. the genotype that exactly $\frac{1}{4}$ of the children will inherit

36. Fruit flies have 3 chromosomes plus sex chromosomes (X and Y). Mutations occurred within four different cells of an individual female fruit fly as shown in the table below.

Cell Type	Chromosome	Trait	Normal Phenotype	Mutated Phenotype
exoskeleton	2	head features	eyes present	eyes are absent
gamete	2	wing shape	straight wings	curly wings
muscle	X	body color	tan body	yellow body
nerve	3	antenna shape	normal antennae	leg-shaped antennae

Which of these mutations could be passed on to this fruit fly's offspring?

A. absent eyes

B. curly wings

C. yellow body

D. leg-shaped antennae

37. The inheritance of a trait in humans is *best* described as being determined by

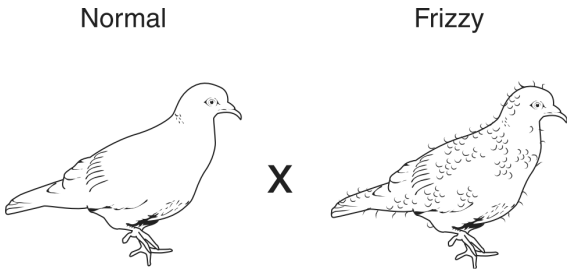
A. a single allele.

B. one or more pairs of alleles.

C. one pair of chromosomes.

D. the sex chromosomes of the offspring.

38. In pigeons, the allele for normal feathers (F) is dominant to the allele for frizzy feathers (f).



If a purebred, normal-feathered bird (FF) is crossed with a frizzy-feathered bird (ff), how many different feather phenotypes are possible in the offspring?

A. 1 B. 2 C. 3 D. 4

39. Which of the following *best* describes the inheritance of a sex-linked trait?

A. a recessive allele carried by females that affects only males

B. a dominant allele carried by females that affects only males

C. an allele carried on the Y chromosome that can affect both males and females

D. an allele carried on an X chromosome that can affect males or females

40. A particular allele in mice is lethal in homozygotes. Heterozygotes, however, develop normally. Why does this allele remain in the population?

A. Homozygous mice pass the allele to their offspring.

B. The recessive allele is masked in heterozygotes.

C. Natural selection selects for the homozygous individual with normal alleles.

D. Natural selection selects against the heterozygous individual.

41. If a corn plant has a genotype of Ttyy, what are the possible genetic combinations that could be present in a single grain of pollen from this plant?

A. Ty, ty

B. TY, ty

C. TY, Ty, ty

D. Ty, ty, tY, TY

42. In fruit flies, the gene for red eyes (R) is dominant and the gene for sepia eyes (r) is recessive. What are the possible combinations of genes in the offspring of two red-eyed heterozygous flies (Rr)?

A. RR only

B. rr only

C. Rr and rr only

D. RR, Rr, and rr only

43. In fruit flies, the allele for red eyes (R) is dominant and the allele for sepia eyes (r) is recessive. A female fly has red eyes. How can you determine the female fly's genotype?

A. Mate the female with a male with red eyes. If any of the offspring have sepia eyes, she must be RR.

B. Mate the female with a male with red eyes. If any of the offspring have red eyes, she must be Rr.

C. Mate the female with a male with sepia eyes. If any of the offspring have sepia eyes, she must be Rr.

D. Mate the female with a male with sepia eyes. If any of the offspring have red eyes, she must be RR.

44. Fur color in cats is controlled by an autosomal gene that can occur in the dominant form, (B), or the recessive form, (b). The length of the cat's fur is controlled by another autosomal gene that occurs in the dominant form, (S), or the recessive form, (s). The table below shows the traits for these allele codes.

Gene	Trait
B	black fur
b	white fur
S	short-haired fur
s	long-haired fur

The following genotypes were found in a male cat and a female cat.

BbSs (male) bbSS (female)

Which one of the following choices is true of the phenotype of offspring from these parents?

A. All offspring will have black fur.

B. All offspring will have white fur.

C. All offspring will have long-haired fur.

D. All offspring will have short-haired fur.

45. In human beings, earlobes can be free or attached. Some people can roll their tongues while others cannot.

The genotype and phenotype of two parents are shown below.

	Male	Female
Genotype	**FFTt**	**Fftt**
Phenotype	**Free earlobes, Can roll tongue**	**Free earlobes, Cannot roll tongue**

KEY:
F = Free earlobe
f = Attached earlobe
T = Can roll tongue
t = Cannot roll tongue

Which trait *cannot* be transferred by this mother?

A. Free earlobes B. Attached earlobes

C. Cannot roll tongue D. Can roll tongue

46. **Dog Data**

Dog	Sleeping Location	Collar Color	Coat Color	Type of Food
1	Box	Blue	Brown	Canned
2	Rug	Green	Black	Dry Pellets

If these two dogs have puppies together, which of the following will *most likely* be passed on to the puppies?

A. Sleeping location B. Collar color

C. Coat color D. Type of food

47. Which of the following traits could be passed down (inherited) from parents?

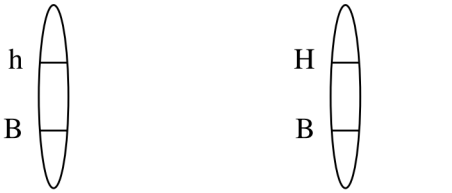
A. Having blue eyes

B. Knowing how to ride a bicycle

C. Knowing how to read

D. Having short fingernails

48. The figures below represent two chromosomes from an animal.



Chromosome #6 from father

Chromosome #6 from mother

Using the table below that describes the traits carried on Chromosome #6, which trait can the animal inherit only from its mother?

Genes on Chromosome #6	Trait
H	long hair
h	short hair
B	black hair
b	white hair

A. long hair

B. black hair

C. white hair

D. short hair

49. Jerome crossed two purple-flowered plants. The offspring produced from this cross had either white flowers or purple flowers, as shown in the table below.

Number of Offspring	Flower Color
10	Purple
3	White

Which of the following statements *best* explains why some of the offspring have white flowers?

A. These offspring were created by asexual reproduction.

B. These offspring were produced in a dark environment.

C. These offspring inherited a DNA sequence coding for white flowers from each parent plant.

D. These offspring inherited a DNA sequence coding for white flowers from only one parent plant.

50. Which of the following is an example of codominance in genetic traits?

A. A tall pea plant and a short pea plant produce tall pea plants.

B. An orange cat and a black cat produce an orange-and-black kitten.

C. A blue-eyed man and a brown-eyed woman produce a blue-eyed child.

D. A color-blind woman and a man with normal vision produce a color-blind son.

51. Genetic information for a breed of chicken is shown below.

Frizzle Fowl

Types of Chickens with Different Feathers	
Genotype	**Phenotype**
FF	Normal (Normal feathers)
Ff	Frizzle fowl (Curly feathers)
ff	Feather shedder (Loses feathers easily)

Which of the following crosses of chickens will produce *only* Frizzle fowl offspring?

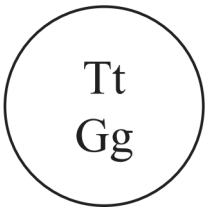
A. Normal × Frizzle fowl

B. Frizzle fowl × Frizzle fowl

C. Normal × Feather shedder

D. Feather shedder × Feather shedder

52. The diagram below represents a cell. The letters in the diagram represent alleles for two different genetic traits.



According to Mendel's law of independent assortment, which of the following shows all of the allele combinations expected in gametes produced by this cell?

A. TT tt GG gg

B. TG TG tg tg

C. TG tG Tg tg

D. Tt Tt Gg Gg

53. Within an individual mouse, four different mutations occurred in different genes, located on separate chromosomes and in different cells, as shown in the table below.

Cell Type	Chromosome	Trait	Normal Phenotype	Mutated Phenotype
skin	chromosome 4	fur color	black fur	white fur
gamete	chromosome 3	eye color	brown eyes	blue eyes
muscle	chromosome 2	fur thickness	thick fur	thin fur
nerve	chromosome 1	tail length	long tail	short tail

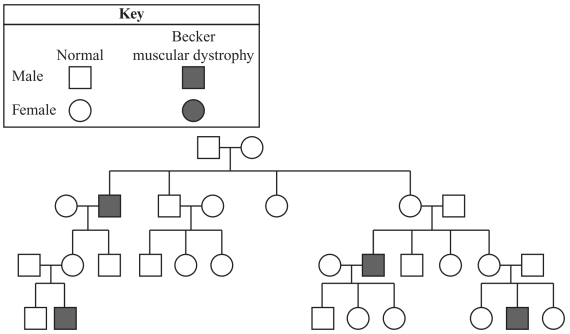
Which of these mutations could be passed on to the mouse's offspring?

A. white fur
B. blue eyes
C. thin fur
D. short tail

54. Two spotted leopards produce a litter of four cubs. Three of the cubs are spotted and one is solid black. The black coat is *probably* what type of trait?

A. dominant
B. recessive
C. polygenic
D. sex-linked

55. The pedigree below shows the occurrence of Becker muscular dystrophy in a family. Becker muscular dystrophy causes muscle weakness.



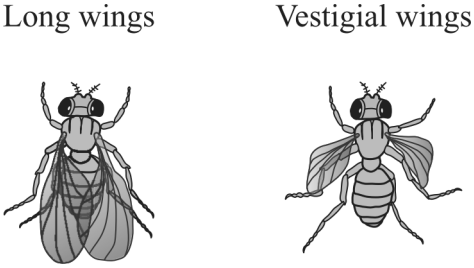
Based on this pedigree, it is *most* reasonable to conclude that Becker muscular dystrophy is which of the following?

A. a polygenic trait
B. a codominant trait
C. a sex-linked recessive trait
D. an autosomal dominant trait

56. Which of the following terms applies to traits, such as human eye color, that are controlled by more than one gene?

A. codominant
B. polygenic
C. recessive
D. sex-linked

57. In fruit flies, a single gene controls wing phenotype. The diagram below shows the phenotypes for long wings and vestigial wings in fruit flies.



Two fruit flies that have long wings are crossed. Of the 95 offspring produced, 73 have long wings. The other 22 have vestigial wings.

Which of the following conclusions about the inheritance of long wings and vestigial wings is *best* supported by the results of this experiment?

A. The alleles for long wings and vestigial wings are sex-linked.

B. The alleles for long wings and vestigial wings are codominant.

C. The allele for long wings is dominant and the allele for vestigial wings is recessive.

D. The allele for long wings is recessive and the allele for vestigial wings is dominant.

58. In pea plants, the genes for seed color and seed shape are on different chromosomes. Which of the following explains why the genes for these traits are not inherited together?

A. natural selection

B. artificial selection

C. the law of segregation

D. the law of independent assortment

59. In some pea plant experiments, Mendel studied the inheritance patterns of two characteristics at once, such as seed shape and seed color. He did this to determine which of the following?

A. the process by which mutations occur

B. where genes are located within chromosomes

C. whether characteristics are inherited together or separately

D. the number of crosses necessary to cause physical changes in inheritance patterns

60. A gene in horses controls whether the horse has a white coat or a colored coat. A white female horse and a white male horse are the parents of a total of five female offspring. Three of these offspring have white coats. The other two offspring have colored coats.

The phenotypes of the horses suggest which of the following as the *most likely* pattern of inheritance for coat color?

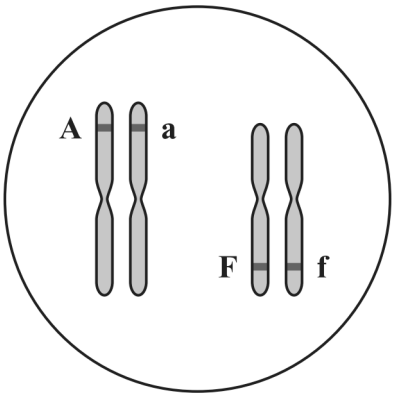
A. The allele for a white coat is dominant.

B. The allele for a white coat is recessive.

C. The allele for a white coat is sex-linked.

D. The allele for a white coat is codominant.

61. Two chromosome pairs from a diploid organism are shown below.



Assuming meiosis and fertilization occur normally, which of the following pairs of alleles can an offspring receive from this parent?

A. **A** and **A**
B. **A** and **a**
C. **A** and **f**
D. **F** and **F**

62. Which of the following statements *best* explains why offspring produced by sexual reproduction often look similar to, but not exactly the same as, their parents?

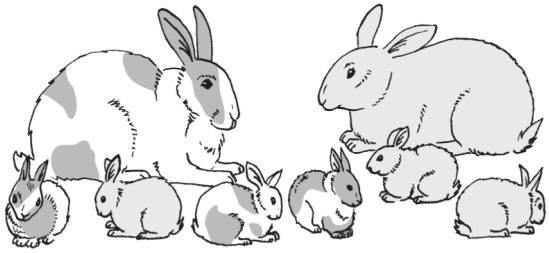
A. The offspring have genetic material from both the mother and the father.
B. The cells of the offspring contain all the dominant genes from the parents.
C. The cells of the offspring undergo mitosis many times as the offspring grow and develop.
D. The offspring have a period of embryonic development, rather than being born immediately after fertilization.

63. In humans, freckles are encoded by a dominant allele. An individual woman is heterozygous for freckles.

According to the law of segregation, which of the following would apply to a child of this woman?

A. The child must inherit the dominant allele for freckles.
B. The child must inherit the recessive allele for freckles.
C. The child has an equal chance of inheriting the dominant allele or the recessive allele for freckles from her mother.
D. The child has a greater chance of inheriting the dominant allele than the recessive allele for freckles from her mother.

64. The illustration below shows two adult rabbits and their offspring.



In rabbits, the allele for spots (**R**) is dominant to the allele for solid color (**r**). What is the *most likely* genotype of the parent rabbits in the illustration?

A. **rr** × **rr**
B. **Rr** × **rr**
C. **Rr** × **Rr**
D. **RR** × **rr**

65. Hemophilia is an X-linked recessive condition in which blood does not clot properly. Queen Victoria of England had one allele for hemophilia.

Which of the following statements describes the *most likely* pattern for the occurrence of hemophilia in Queen Victoria's descendants?

A. All of Queen Victoria's children had hemophilia.

B. All of Queen Victoria's children were carriers for hemophilia.

C. Female descendants of Queen Victoria could not pass on the gene for hemophilia.

D. More male descendants than female descendants of Queen Victoria had hemophilia.

66. Eye color is a physical trait.

Which statement *best* explains why a child has a specific eye color?

A. Eye color is a learned trait.

B. Eye color is an inherited trait.

C. Eye color is a trait that changes over time.

D. Eye color is a trait that happens by chance.

67. A parent and a child share several characteristics. Both individuals are tall, have curly hair, are good cooks, and have freckles.

Which of these characteristics is a learned behavior?

A. being tall B. having curly hair

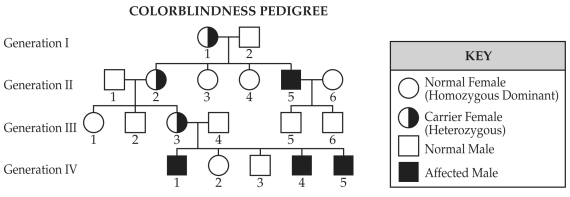
C. being a good cook D. having freckles

68. A genetics study was conducted that crossed two red-flowered plants. The next generation was a mixture of red-flowered and white-flowered offspring. Which of these genotypes represents those of the parent generation?

A. rr and rr B. Rr and Rr

C. RR and rr D. RR and RR

69. The pedigree below shows the occurrence of red-green colorblindness in four generations of a family. Use the information in the pedigree to answer the following question(s).



How many individuals have red-green colorblindness in the four generations shown in the pedigree?

A. 3 B. 4 C. 7 D. 12

70. In dogs, brown fur (B) is dominant to white fur (b). A dog has a litter of 12 puppies of which 6 are brown and 6 are white. Which of these Punnett squares shows the cross that occurred?

A.

	B	**b**
B		
B		

B.

	B	**b**
B		
b		

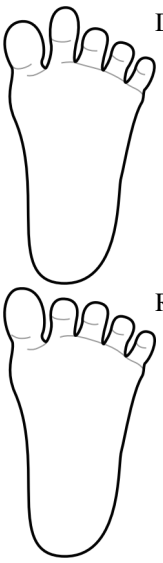
C.

	B	**B**
b		
b		

D.

	B	**b**
b		
b		

71. In humans, the trait for having a second toe that is longer than the big toe (T) is dominant; the trait for having a second toe that is shorter than the big toe (t) is recessive. The two traits are shown in the figure below.



Dominant Trait

Recessive Trait

A family has eight children. Six children have second toes that are longer than the big toe. Two children have second toes that are shorter than the big toe. What are the *most likely* genotypes of the parents?

A. Tt and Tt

B. Tt and tt

C. TT and tt

D. TT and TT

72. Individuals within a population of rabbits have different colors of fur as shown in the diagram below.

DISTRIBUTION OF RABBIT FUR COLOR

The difference in the fur color of the individual rabbits is described as

A. speciation
B. variation
C. evolution
D. succession

73. Use the information and the table below to answer the following question(s).

A group of students wanted to determine how the ability to taste PTC, a nontoxic chemical, is passed from one generation to the next. The students decided to test families in their community for this ability. The students gave each family member a paper strip coated with a small amount of PTC. Those who experienced the bitter taste of PTC when they touched the paper strips to their tongues were called "tasters"; those who could not taste the PTC were called "nontasters."

The results of the experiment are shown in the table below.

ABILITY TO TASTE PTC IN CHILDREN OF THREE GROUPS OF PARENTS

Parent Group	Children of Each Parent Group	
	Percent Tasters	Percent Nontasters
Both parents tasters	85	15
One parent taster, one parent nontaster	62	38
Both parents nontasters	0	100

Based on the data the students collected, the allele for tasting PTC is *most likely*

A. dominant
B. heterozygous
C. recessive
D. sex-linked

74. Which of these combinations results in the expression of a recessive trait?

A. two dominant alleles
B. a dominant sex-linked allele and a Y chromosome
C. two recessive alleles
D. a dominant allele and a recessive allele

75. Use the information below to answer the following question(s).

In a species of fly, the allele for red eyes (R) is dominant to the allele for brown eyes (r). Red eye color in the flies is not sex-linked. Students crossed male and female flies that had red eyes and recorded the eye color of their offspring. Their data are shown below.

FLY OFFSPRING

Eye Color	Number of Offspring
Red	77
Brown	27

What are the *most likely* genotypes of the parent flies?

A. RR and *rr*
B. Rr and Rr
C. *rr* and *rr*
D. RR and Rr

76. If a human baby boy inherits a recessive allele from his mother, in which circumstance would he *most* likely show the trait coded for by the recessive allele?

A. The baby inherits the dominant allele from his father.
B. The allele is on an autosomal chromosome and the baby is a twin.
C. The allele is on the X chromosome.
D. The allele is on the Y chromosome.

77. **Rabbit coat color**

Allele	Phenotype
C	Rabbit with fully colored coat
c^{ch}	Rabbit with light gray coat
c^{h}	Himalayan rabbit: white with dark ear tips, nose, paws, and tail
c	Albino rabbit

Order of dominance C → c^{ch} → c^{h} → c

The chart shows four alleles at the same locus that affect rabbits' coat color. Each allele is dominant to the ones below it. Rabbits with an albino or Himalayan coat are more susceptible to predators. Which of the following genotypes will produce a rabbit that is *least* likely to survive?

A. $c^{ch}c$ B. Cc C. $c^{h}c$ D. Cc^{h}

78. In human beings, earlobes can be free or attached. Some people can roll their tongues while others cannot.

The genotype and phenotype of two parents are shown below.

	Male	Female
Genotype	FFTt	Fftt
Phenotype	Free earlobes, Can roll tongue	Free earlobes, Cannot roll tongue

KEY:
F = Free earlobe
f = Attached earlobe
T = Can roll tongue
t = Cannot roll tongue

Which trait will all of the offspring of the cross shown above exhibit?

A. Can roll tongue
B. Cannot roll tongue
C. Attached earlobes
D. Free earlobes

79. In pea plants, the allele for purple flowers (F) is dominant to the allele for white flowers (f) A cross between two plants produces 306 offspring with purple flowers and 95 offspring with white flowers

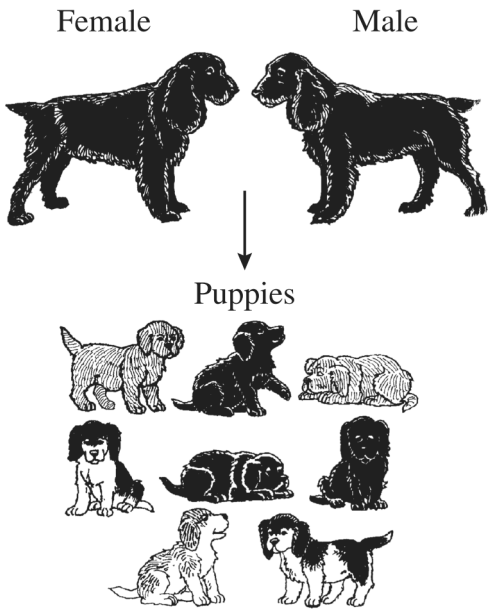
What are the genotypes of the parent plants?

A. FF and ff
B. FF and Ff
C. Ff and ff
D. Ff and Ff

80. Which factor determines the color of a person's eyes?

A. Whether the person 's eye ceiis are diploid or haploid
B. The type of proteins produced by the person's eye cells
C. Whether the person's eye cells undergo mitosis or meiosis
D. The number of chromosomes in each of the person's eye cells

81. The picture below shows two dogs and their puppies.



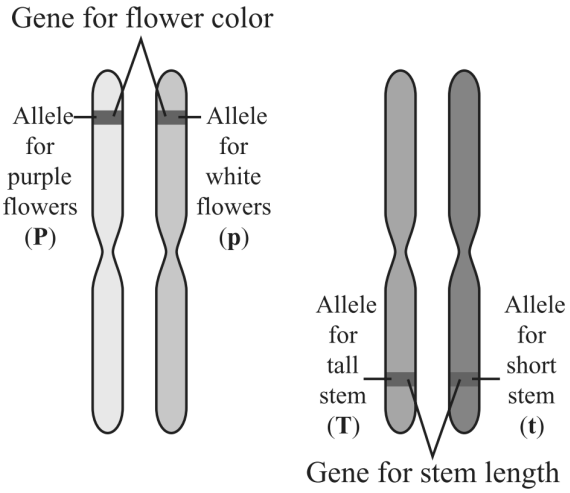
The parent dogs are each heterozygous for two traits: fur color and white spotting. Both parent dogs are solid black. Their puppies, however, have four different phenotypes as listed below

- solid black
- black with white spots
- solid red
- red with white spots

Which of the following explains how these parent dogs can produce puppies with these four phenotypes?

A. The genes for these traits aresex-linked.
B. The genes for these traitsmutate frequently.
C. The genes for these traitsassort independently.
D. The genes for these traits areon the same chromosome.

82. The diagram below shows the positions of the genes for flower color and stem length in a pea plant. The chromosomes represented below will replicate before meiosis.



For these two genes, what is the maximum number of different allele combinations that can be formed normally in gametes produced from this cell?

A. 2 B. 4 C. 6 D. 8

83. In a certain variety of chicken, some offspring have a feather pattern that is black-and-white checkered. Chickens with this checkered feather pattern result from the cross of a black chicken with a white chicken.

Which of the following types of inheritance is *most likely* responsible for the checkered feather pattern?

A. codominant B. dominant

C. polygenic D. sex-linked

84. An inherited metabolic disorder called phenylketonuria (PKU) can result in serious problems in infancy. The chance that two parents who are heterozygous will have a child with PKU is 25%.

Which of the following terms *best* applies to the inheritance pattern for PKU?

A. codominant B. dominant

C. recessive D. sex-linked

Mendel's laws 4/25/2019

1.
Answer: B

2.
Answer: C

3.
Answer: C

4.
Answer: D

5.
Answer: D

6.
Answer: A

7.
Answer: B

8.
Answer: B

9.
Answer: B

10.
Answer: A

11.
Answer:

12.
Answer: A

13.
Answer: D

14.
Answer: A

15.
Answer: D

16.
Answer: A

17.
Answer: C

18.
Answer: B

19.
Answer: C

20.
Answer: C

21.
Answer: B

22.
Answer: B

23.
Answer: C

24.
Answer: A

25.
Answer: D

26.
Answer: D

27.
Answer:

28.
Answer: C

29.
Answer: B

30.
Answer: B

31.
Answer: C

32.
Answer: D

33.
Answer: A

34.
Answer: A

35.
Answer: C

36.
Answer: B

37.
Answer: B

38.
Answer: A

39.
Answer: D

40.
Answer: B

41.
Answer: A

42.
Answer: D

43.
Answer: C

44.
Answer: D

45.
Answer: D

46.
Answer: C

47.
Answer: A

48.
Answer: A

49.
Answer: C

50.
Answer: B
Objective: B.06F

51.
Answer: C

52.
Answer: C

53.
Answer: B
Objective: B.06E

54.
Answer: B

55.
Answer: C

56.
Answer: B

57.
Answer: C

58.
Answer: D

59.
Answer: C

60.
Answer: A

61.
Answer: C

62.
Answer: A

63.
Answer: C

64.
Answer: B

65.
Answer: D

66.
Answer: B

67.
Answer: C

68.
Answer:

69.
Answer:

70.
Answer:

71.
Answer: A

72.
Answer: B

73.
Answer: A

74.
Answer: C

75.
Answer: B

76.
Answer: C

77.
Answer: C

78.
Answer: D

79.
Answer: D

80.
Answer: B

81.
Answer: C

82.
Answer: B

83.
Answer: A

84.
Answer: C