

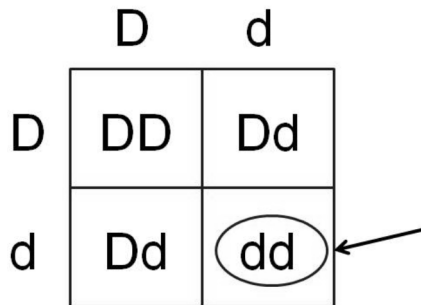
Genetics Practice Questions

Name: _____

Date: _____

1. 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.

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



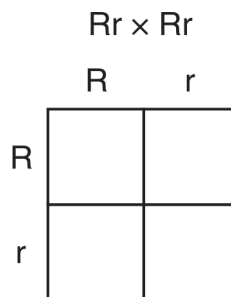
The arrow is pointing to a circled genotype in the square. What genotype does the circled “dd” represent?

- 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

3. 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*.

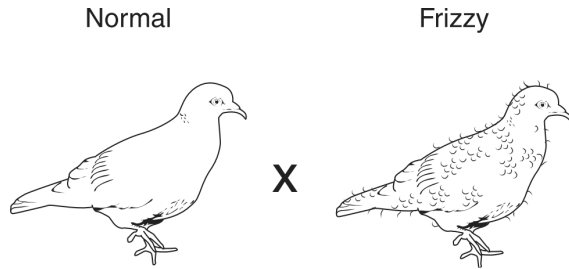
4. The diagram below represents a cross between two pea plants.



In pea plants, the allele for round seeds (*R*) is dominant to the allele for oval seeds (*r*). In a cross between the two plants above, what percentage of the offspring will have round seeds?

- A. 100% B. 75% C. 50% D. 25%

5. 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

6. 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

7. 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.

8. 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.

9. 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

10. 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?

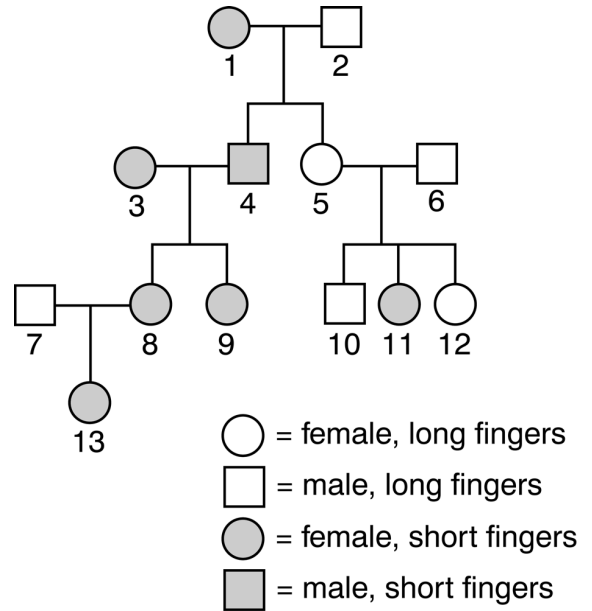
- A. FF and ff B. FF and Ff
C. Ff and ff D. Ff and Ff

11. Hemophilia is an X-linked recessive trait. In a family, the father is unaffected and the mother carries only one recessive allele.

Which outcome is expected for their offspring?

- A. All of the male offspring would be affected,
B. Half of the male offspring would be affected.
C. All of the female offspring would be affected.
D. Half of the female offspring would be affected.

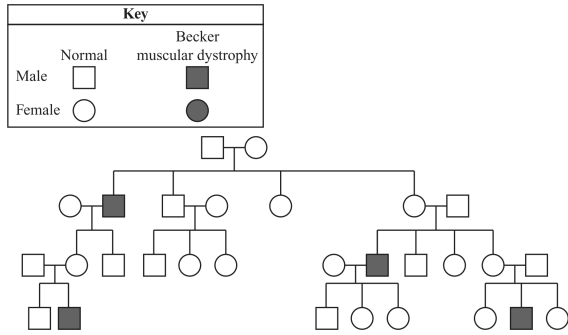
12. Use the pedigree below to answer the following question.



Which cross provides conclusive evidence that short fingers are recessive to long fingers?

- A. the cross between individuals 1 and 2
B. the cross between individuals 3 and 4
C. the cross between individuals 5 and 6
D. the cross between individuals 7 and 8

13. 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?

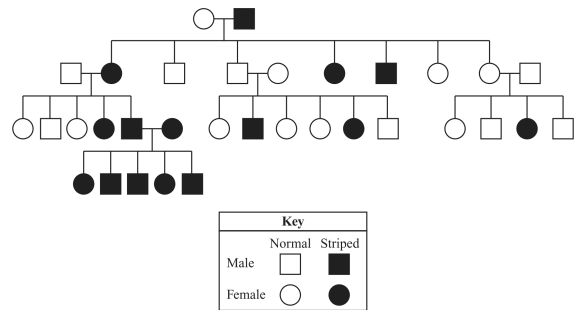
- A. a polygenic trait
 B. a codominant trait
 C. a sex-linked recessive trait
 D. an autosomal dominant trait
14. Which of the following terms applies to traits, such as human eye color, that are controlled by more than one gene?

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

15. 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

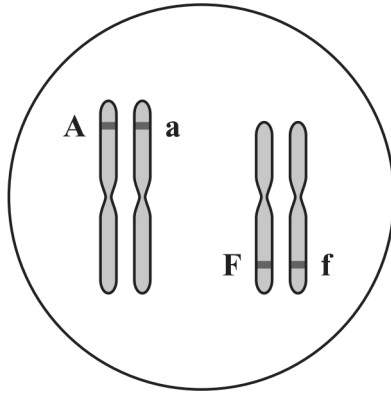
16. A pedigree showing the inheritance of a gold dorsal stripe pattern in ball pythons is shown below.



According to the pedigree, what type of trait is this stripe pattern in ball pythons?

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

17. 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**

18. 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		

19. Which of these is an example of a heterozygous genotype?

- A. Rr B. RR
 C. wrinkled D. round

20. The phenotype of an animal depends *most* directly on—

- A. how the genes of the animal are expressed.
 B. the metabolic rate of the animal.
 C. the source of the animal's food.
 D. how many cells are in the animal's body.

21. A gardener planted red flowering plants in a garden. He crossed the red flowers with white flowers, and the offspring flowers were pink. This is an example of—

- A. A incomplete dominance.
 B. sex linkage.
 C. multiple alleles.
 D. homozygous inheritance.

22.

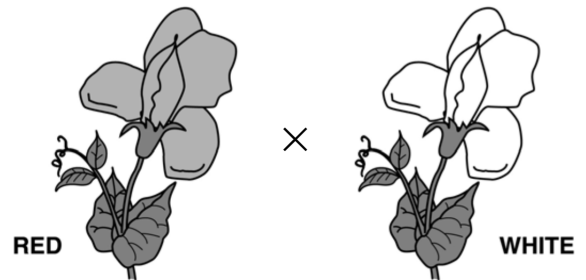
	I ^B	i
I ^A	I ^A I ^B	I ^A i
I ^B	I ^B I ^B	I ^B i

Genotype	Blood Type
I ^A i	A
I ^A I ^A	A
I ^B I ^B	B
I ^B i	B
I ^A I ^B	AB
i i	O

A woman with Type AB blood marries a man with Type B blood. According to the Punnett square, their children could have each of these blood types *except*—

- A. Type A. B. Type B.
 C. Type AB. D. Type O.

23.



The trait for flower color in the plants shown above is controlled by incomplete dominance. What percent of the offspring will have pink flowers?

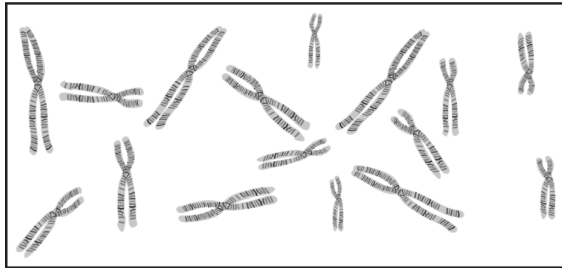
- A. 0% B. 25% C. 50% D. 100%

24. A student is studying the inheritance of human blood types. Types A and B are codominant and O is recessive to both.

If a woman with blood type A and a man with blood type B would have children, what would be the largest expected percentage for offspring with blood type O?

- A. 0% B. 25% C. 50% D. 100%

25. The diagram below shows the chromosomes from a cell after they were photographed under a microscope.



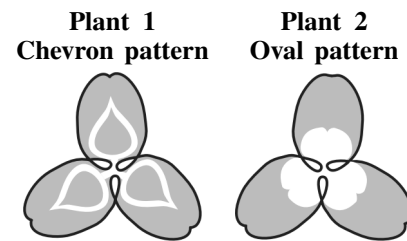
Which of the following questions may *best* be answered by studying an organism's chromosomes?

- A. What sex is the organism?
 B. Is the organism endangered?
 C. Where is the organism's ecosystem?
 D. How does the organism obtain its food?

26. A mutation in which of the following types of cells could be passed on to an organism's offspring?

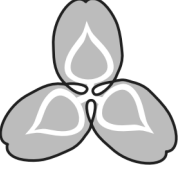
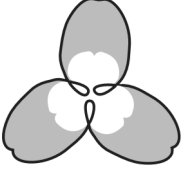

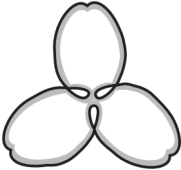
- A. blood B. egg
 C. muscle D. nerve

27. Leaves from two white clover plants, each with a different pattern, are shown below.



The leaf patterns are genetically determined by alleles of a single gene. Plant 1 is homozygous for the chevron allele. Plant 2 is homozygous for the oval allele. The chevron and oval alleles are codominant.

If plant 1 and plant 2 are crossed, the codominance of the alleles will *most likely* result in which of the following leaf patterns on the offspring plants?

- A.  B. 
 C.  D. 

28. Height is a polygenic trait in humans. Which of the following statements *best* explains the genetics of this trait?

- A. Height is controlled by more than one gene.
- B. Height is controlled by a single dominant gene.
- C. The gene for height is located on the X chromosome.
- D. The gene for height is located on the Y chromosome.

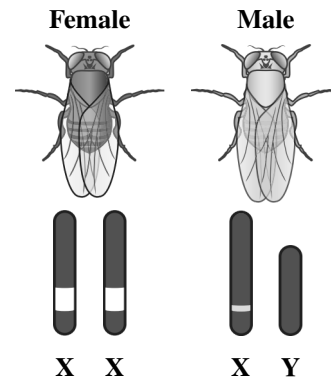
29. The table below shows the genotypes that result in four different blood types in humans.

Genotype	Blood Type
$I^A I^A, I^A i$	A
$I^B I^B, I^B i$	B
$I^A I^B$	AB
ii	O

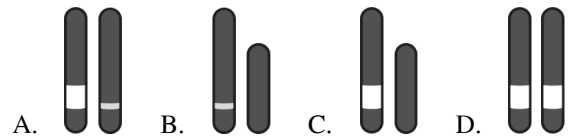
Based on the information in the table, which of the following describes alleles I^A and I^B ?

- A. The I^A and I^B alleles show sex linkage.
- B. The I^A allele is recessive to the I^B allele.
- C. The I^A allele is dominant to the I^B allele.
- D. The I^A and I^B alleles show codominance.

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



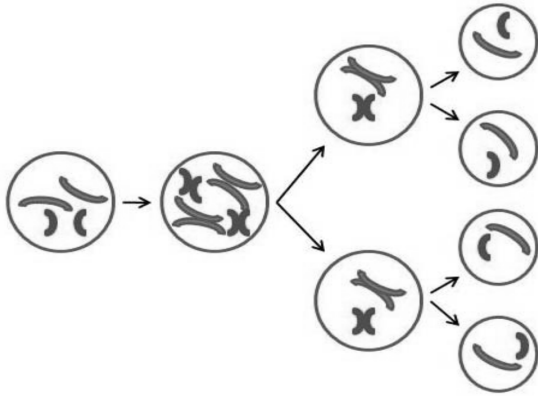
The two fruit flies are crossed with each other. The female offspring of the fruit flies will receive which pair of chromosomes?



31. 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

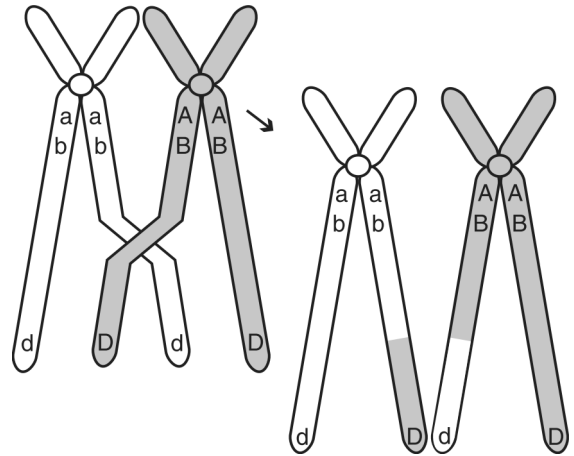
32. The distribution of chromosomes in one type of cell division is shown in the diagram below.



Which process and type of resulting cells are represented in the diagram?

- A. mitosis, which produces gametes
- B. mitosis, which produces body cells
- C. meiosis, which produces gametes
- D. meiosis, which produces body cells

33.



The diagram above shows homologous chromosomes during prophase I of meiosis. Which of the following correctly describes the process being illustrated?

- A. mutation in which the DNA content of the gene is altered
- B. segregation of sister chromatids
- C. condensation and segregation of alleles
- D. crossing-over in which alleles are exchanged

34. Which of the following sequences represents chromosome number during fertilization?

- A. $n + n \rightarrow 2n$
- B. $2n \rightarrow n + n$
- C. $n \rightarrow n$
- D. $2n \rightarrow 2n$

35. The table below lists the typical diploid number of chromosomes of several different organisms.

Diploid Chromosome Number

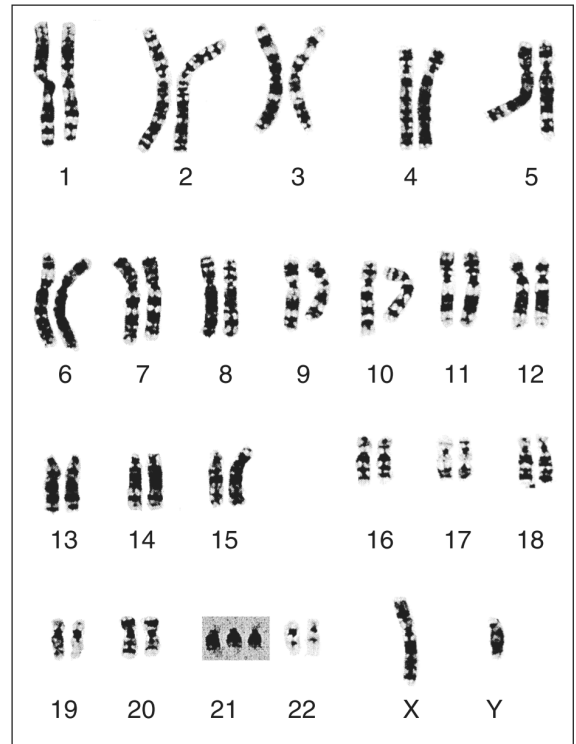
Goldfish	94
Potato	48
Human	46
Pea	14
Fruit fly	8

Which of the following is the *best* explanation for why the chromosome number is an even number in each of these organisms?

- A. It is only a coincidence; many other organisms have an odd number of chromosomes.
- B. The diploid chromosome number is always even so that when mitosis occurs each new cell gets the same number of chromosomes.
- C. The diploid chromosome number represents pairs of chromosomes, one from each parent, so it is always an even number.
- D. Chromosomes double every time the cell divides, so after the first division, the number is always even.
36. Mendel hypothesized that reproductive cells have only one factor for each inherited trait. This hypothesis is supported by the observation that
- A. haploid cells are produced by mitosis.
- B. diploid cells are produced by mitosis.
- C. haploid cells are produced by meiosis.
- D. diploid cells are produced by meiosis.

37. If an intestinal cell in a butterfly contains 24 chromosomes, a butterfly egg cell would contain
- A. 3 chromosomes. B. 6 chromosomes.
- C. 12 chromosomes. D. 24 chromosomes.

38. The picture below shows the chromosomes of a human.



What caused the chromosomal alteration in number 21?

- A. part of one chromosome attached to another chromosome (translocation)
- B. some of the genes on a chromosome were reversed (inversion)
- C. a duplicated chromosome failed to separate (nondisjunction)
- D. a part of a chromosome was lost (deletion)

39. Which statement describes asexual and sexual reproduction?
- A. Asexual is one part of sexual reproduction.
 - B. Sexual reproduction happens before asexual.
 - C. Asexual needs one parent, and sexual needs two parents.
 - D. Sexual happens only in animals, and asexual happens only in plants.

40. Which of these situations is an example of asexual reproduction?
- A. Two organisms mate to produce offspring.
 - B. Specialized cells divide to produce gametes.
 - C. Crossbreeding of plants produces new varieties.
 - D. A single-celled organism divides to produce offspring.

Genetics Practice Questions 05/27/2015

- | | |
|-----------------------|-----------------------|
| 1.
Answer: C | 21.
Answer: A |
| 2.
Answer: C | 22.
Answer: D |
| 3.
Answer: C | 23.
Answer: D |
| 4.
Answer: B | 24.
Answer: B |
| 5.
Answer: A | 25.
Answer: A |
| 6.
Answer: D | 26.
Answer: B |
| 7.
Answer: B | 27.
Answer: C |
| 8.
Answer: C | 28.
Answer: A |
| 9.
Answer: A | 29.
Answer: D |
| 10.
Answer: D | 30.
Answer: A |
| 11.
Answer: B | 31.
Answer: A |
| 12.
Answer: C | 32.
Answer: C |
| 13.
Answer: C | 33.
Answer: D |
| 14.
Answer: B | 34.
Answer: A |
| 15.
Answer: D | 35.
Answer: C |
| 16.
Answer: C | 36.
Answer: C |
| 17.
Answer: C | 37.
Answer: |
| 18.
Answer: | 38.
Answer: C |
| 19.
Answer: A | 39.
Answer: C |
| 20.
Answer: A | 40.
Answer: D |