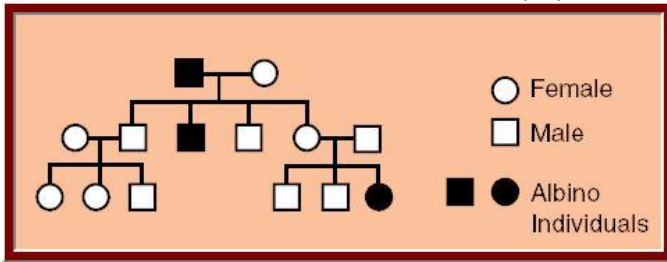
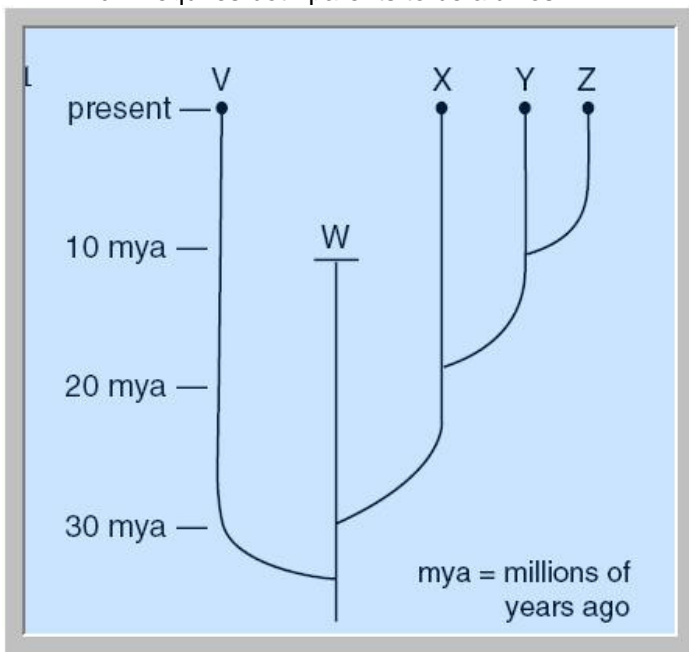


Name \_\_\_\_\_ Date \_\_\_\_\_

BIO SOL Review 15 - Genetics & Evolution (28)



- (2006-44) Albinos lack all pigmentation so that their hair and skin are white. This family tree shows that albinism —
  - is carried only by females in this family
  - is a recessive genetic trait**
  - is a sex-linked gene
  - requires both parents to be albinos



- (2006-11) Which statement is best supported by the phylogenetic tree shown?
  - Species W is still developing from a prior species.
  - Species W first came into existence 10 million years ago.
  - Species V is still alive today and is the oldest species.**
  - Species X, Y, and Z became extinct 20 million years ago.

- (2006-10) In squash plants, yellow fruit (Y) is dominant to white fruit (y). If two plants heterozygous for yellow fruit are crossed, what are the possible genotypes of the offspring?
  - YY, Yy, yy only**
  - YY, yy only
  - Yy only
  - Yy, yy only

T = dominant allele for height, tall plant  
 t = recessive allele for height, short plant  
 P = dominant allele for color, purple  
 p = recessive allele for color, white

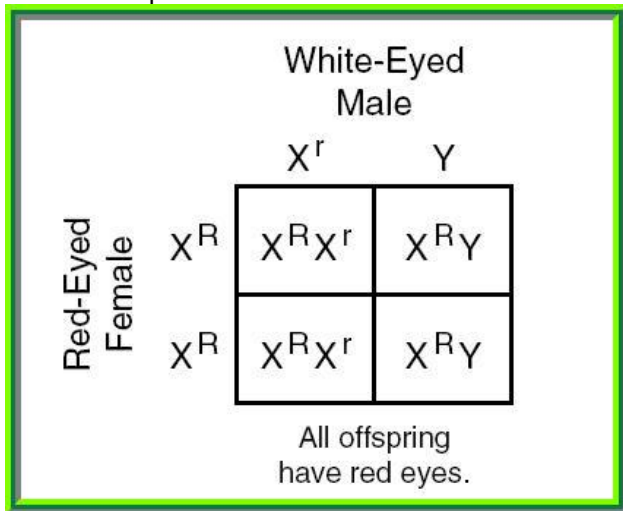
	TP	TP	TP	TP
tp				
tp				
tp				
tp				

- (2006-6) Two plants are crossed, and the traits of height and color are assessed in the offspring. The following cross was conducted: TTPP x ttp. Which of the following choices correctly describes the offspring?
  - Three-quarters of the plants are tall and purple.
  - All are tall and purple.**
  - Three-quarters of the plants are short and white.
  - All are short and white.
- (2006-4) After a culture of cells is allowed to multiply and is viewed through a microscope, the cells are x-rayed with high-energy radiation for less than 1/100th of a second. After the radiation, many newly reproduced cells appear different. What has probably occurred?
  - Contamination
  - Mutation**
  - Bacterial infection
  - Speciation

♀ \ ♂	T	t
T	TT	Tt
t	Tt	tt

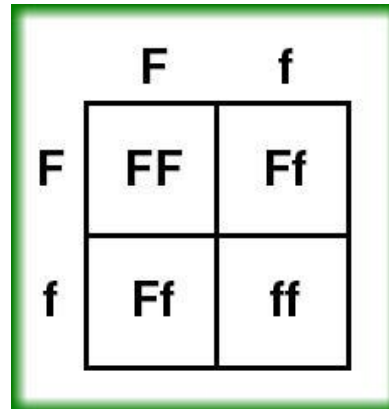
- (2001-32) In pea plants, tall plants are dominant to short plants. If two heterozygous tall plants are crossed, what percent of the offspring will probably be short?
  - 75%
  - 50%
  - 25%**
  - 0%

7. (2001-20) Which of the following is an example of a genetically engineered organism? (1 point)
- Seedless fruits resulting from grafting of one plant onto another
  - A plant that received external DNA to produce natural insecticides**
  - A plant that naturally possesses medicinal properties
  - A new plant variety created by cross-pollination

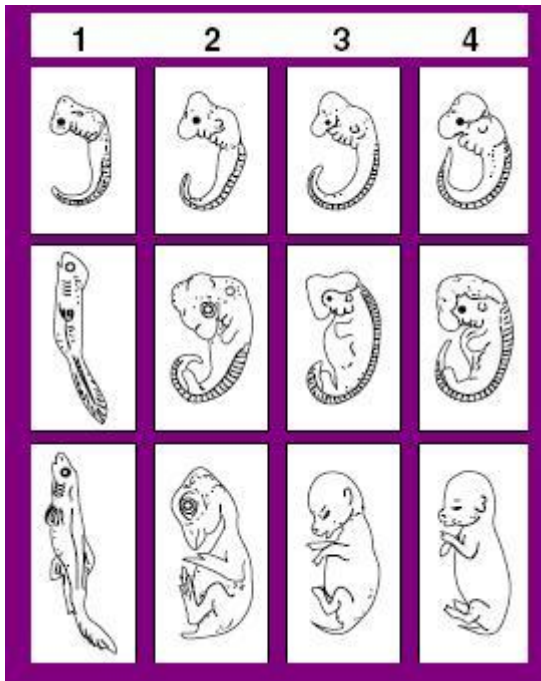


8. (2001-15) In 1910, Thomas Morgan discovered traits linked to sex chromosomes in the fruit fly. The Punnett square above shows the cross between red-eyed females and white-eyed males. Fruit flies usually have red eyes. If a female and male offspring from the cross shown above are allowed to mate, what would the offspring probably look like?
- 2 white-eyed females; 1 white-eyed male and 1 red-eyed male
  - 2 red-eyed females; 1 red-eyed male, 1 white-eyed male**
  - 2 red-eyed females; 2 white-eyed males
  - 1 red-eyed female and 1 white-eyed female; 2 red-eyed males
9. (2001-12) Wild cats such as cheetahs, lions, and tigers experience decreased genetic diversity as their populations decline and become fragmented due to habitat destruction. Decreased genetic diversity leads to populations with —
- increased birthrates
  - disproportionate gender ratios
  - increased immigration rates
  - decreased disease resistance**
10. (2002-44) People who have been exposed to excessive radiation often experience mutations. If these mutations only occur in somatic (body) cells, these people may —
- experience an increased risk of cancer**
  - experience difficulties replicating RNA
  - develop entirely new DNA sequences in all cells
  - pass on these mutations to their offspring

11. (2002-28) In cows, long hair is dominant to short hair. In a cow that is heterozygous for long hair, what percentage of the cells undergoing meiosis will carry the dominant allele?
- 25%
  - 50%
  - 75%**
  - 100%



12. (2002-11) In rabbits, short fur (F) is dominant to long fur (f). According to the Punnett square, what is the chance of two heterozygous short-haired rabbits having offspring with short fur?
- One in four
  - Three in four**
  - Two in four
  - Four in four
13. (2002-7) Which of the following statements describes the process of natural selection?
- Individuals survive that have inherited traits adapted to their environment.**
  - Farmers select animals with desirable variations for breeding.
  - Populations sharing the same gene pool interbreed and create new species.
  - New species are formed via genetic engineering.
14. (2002-3) DNA that is derived from the DNA of two or more different species is called —
- recombinant DNA**
  - mitochondrial DNA
  - plasmid
  - chloroplast DNA
15. (2003-31) Lamarck was an early scientist who studied the development of characteristics in organisms over time. Which of the following choices best describes his views on how organisms change over time?
- Theory of acquired characteristics**
  - Law of independent assortment
  - Theory of relative fossil-dating
  - Theory of artificial selection



16. (2003-48) The above chart shows vertebrate embryo development. Which of these would be least related to the others?

- a. 1
- b. 2
- c. 3
- d. 4

17. (2003-42) The Human Genome Project was begun in 1988 by scientists from 13 nations as a worldwide effort to understand the sequencing of all of the DNA in the human body. What is one potential scientific benefit of this research?

- a. It will create communication between research centers.
- b. It will help to explain human cultural differences.
- c. It helps to classify man most accurately in the animal kingdom.
- d. **It will help find the genes responsible for many diseases**

	G	g
G	GG	Gg
g	Gg	gg

18. (2003-13) In corn plants, green (G) is dominant to albino (g). According to the Punnett square, what is the chance of this heterozygous cross producing albino corn plants?

- a. Two in four
- b. Three in four
- c. Four in four
- d. **One in four**

19. (2004-39) A genetic pedigree showing that only males are affected by a certain disorder is evidence of what type of inheritance?

- a. Dominant
- b. **Sex-linked**
- c. Recessive
- d. Passive

20. (2004-42) One way to increase the number of organisms in an endangered species is to let the few remaining individuals of that species breed. However, this breeding may also lead to species extinction because inbreeding over a short period of time may —

- a. increase beneficial mutations
- b. produce a different species
- c. **reduce genetic diversity**
- d. increase fertility

Rabbit Test Cross Results	
Parent Generation	Black × White
F <sub>1</sub>	all black
F <sub>2</sub>	75% black 25% white

21. (2004-36) What conclusion can be drawn from the genetic information above?

- a. The white parent carried a dominant allele.
- b. All the black rabbits in the F<sub>2</sub> generation are homozygous.
- c. All the white rabbits are heterozygous.
- d. **All the F<sub>1</sub> rabbits carried a recessive allele.**

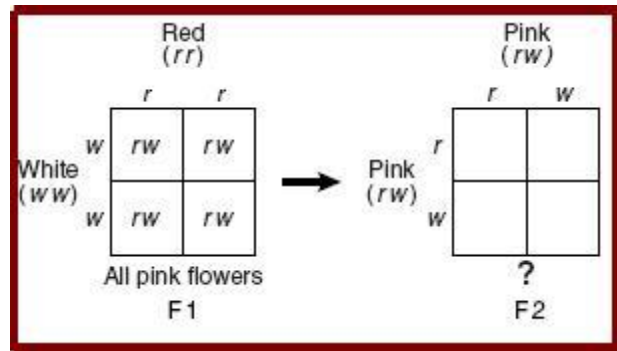
22. (2005-48) The chances of developing cancer, diabetes, or sickle-cell anemia are higher if a family member also has the disorder because they are —

- a. passed through blood contact
- b. related to diet
- c. highly infectious
- d. **genetically based**

23. (2005-2) External sources, such as radiation or chemicals, can cause mutations in genes or entire chromosomes. For a mutation to pass on to offspring, it must occur in a

- a. **sex cell**
- b. muscle cell
- c. bone cell
- d. brain cell

Flower Characteristics		
Characteristics	Insect-Pollinated Plants	Wind- or Water-Pollinated Plants
Appearance	often colorful	plain
Reproductive parts	sometimes hidden	exposed



24. (2005-31) The differences in the above characteristics of flower species most likely resulted from parasitism, which did not harm the host species
- adaptations in response to different selection pressures**
  - defensive mutations allowing concealment of species
  - mutualism between different plant species
25. (2005-30) Change in species is described as a process that usually occurs over long periods of time. Yet, even though antibiotics have only been widely used for fifty years, scientists recognize that overuse of antibiotics has led to antibiotic-resistant strains of bacteria. The reason this can occur in a relatively short span of time is that —
- there are many different types of bacteria
  - bacteria reproduce rapidly**
  - travelers carry bacteria around the world
  - bacteria are very small
26. (2005-17) Over many generations, unrelated or distantly related species may come to resemble each other due to —
- similar environmental factors**
  - competition with each other
  - homologous structural adaptations
  - similar genetic mutations
27. (2005-16) A student hypothesizes that thick leg muscles are an inherited trait in dogs. The student collects data on several dogs, and the data show that dogs that live outdoors have thicker leg muscles than dogs that live indoors. What should the student conclude?
- Inheritance alone may not account for thick leg muscles in dogs.**
  - Dogs that inherit thick leg muscles may not survive indoors
  - Dogs with thick leg muscles may require more exercise than dogs with thin leg muscles.
  - Inheritance of thick leg muscles may be associated with coat thickness in dogs.
28. (2005-6) In snapdragons, the combined expression of both alleles for flower color produces a new phenotype that is pink. This illustrates incomplete dominance. The Punnett square above shows that both the white and red snapdragons are homozygous. Which of the following would be the correct product from a cross between two heterozygous pink snapdragons?
- 2 red, 2 white
  - 2 red, 1 pink, 1 white
  - 1 red, 2 pink, 1 white**
  - 1 red, 1 pink, 2 white