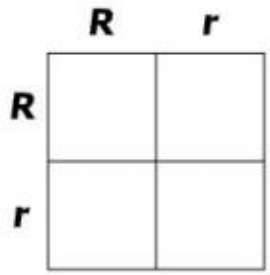
Genetics (Unit 7) SOL Practice Questions

In a plant that has red flowers, red flower color, *R*, is completely dominant to white flower color, *r*. If the plant is heterozygous for flower color, which alleles will be carried by the gametes it produces?

F *R* and *r*
G *R* only
H *r* only
J *Rr* only

Timothy has attached earlobes like his maternal grandfather. His mother and father both have free earlobes, which are dominant. Which statement *best* explains how Timothy inherited attached earlobes?

F He received a recessive allele from each parent.
G He received a dominant allele from each parent.
H He received a recessive allele from his mother and a dominant allele from his father.
J He received a dominant allele from his mother and a recessive allele from his father.



Red flower color is dominant to white flower color in rose plants. What is the expected result of a cross between two heterozygous rose plants?

A 100% red

B 75% red, 25% white

C 50% red, 50% white

D 25% red, 75% white

One parent is heterozygous for a certain trait (*Dd*). The other parent is homozygous dominant (*DD*) for that trait. What is the percent chance that an offspring from this cross will be heterozygous?

A 0%

B 25%

C 50%

D 100%

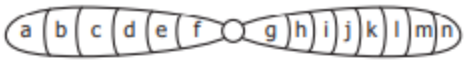
A geneticist studying fruit flies hypothesizes that short wings are a recessive trait coded for by a single gene. Which observation is *most* likely to have led her to form this hypothesis?

F Flies have wing lengths ranging from very long to very short.

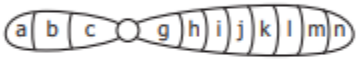
G Flies with long wings are less likely to survive.

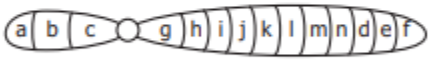
H Flies with long wings can produce offspring with short wings.

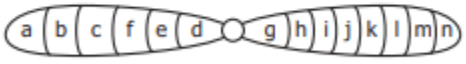
J Flies with short wings prefer to mate with flies with long wings.



The diagram shows the normal sequence of genes in a particular chromosome. Which chromosome could have resulted from a deletion that occurred in this chromosome?

A


B


C


D


	G	g
G	GG	Gg
g	Gg	gg

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 One in four
B Two in four
C Three in four
D Four in four

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

F highly infectious
G passed through blood contact
H genetically based
J related to diet

T T x T T

	T	T
T	T T	T T
T	T T	T T

What ratio of the offspring from the cross shown will be homozygous recessive for the trait of tallness?

A 0 in 4
B 1 in 4
C 2 in 4
D 4 in 4

Two plants are crossed, and the traits of height and color are assessed in the offspring. The following cross was conducted: *TTPP* × *ttpp*.

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

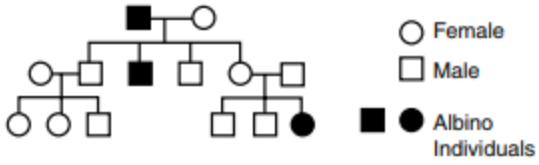
	TP	TP	TP	TP
tp				
tp				
tp				
tp				

Which of the following choices correctly describes the offspring?

F Three-quarters of the plants are tall and purple.
G Three-quarters of the plants are short and white.
H All are short and white.
J All are tall and purple.

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?

F Yy only
G YY, yy only
H Yy, yy only
J YY, Yy, yy only



Albino individuals lack all pigmentation so that their hair and skin are white. This family tree shows that albinism —

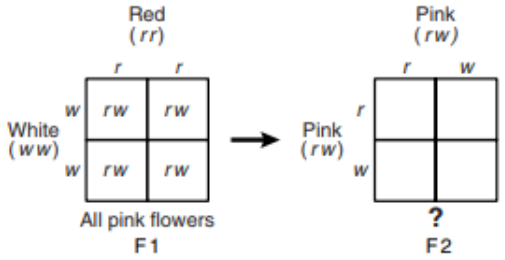
F is carried only by females in this family
G is a recessive genetic trait
H is a sex-linked gene
J requires both parents to be albinos

Which of the following *best* explains why a student researching genetics should use the most recent textbooks available?

A Older textbooks are more difficult to understand.
B Research in Mendelian genetics began very recently.
C New discoveries frequently add to older knowledge in genetics.
D No technologies from more than ten years ago are still in use.

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



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?

F 2 red, 1 pink, 1 white
G 1 red, 2 pink, 1 white
H 1 red, 1 pink, 2 white
J 2 red, 2 white

Rabbit Test Cross Results

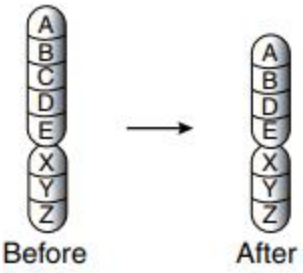
Parent Generation	Black × White
F_1	all black
F_2	75% black 25% white

What conclusion can be drawn from the genetic information above?

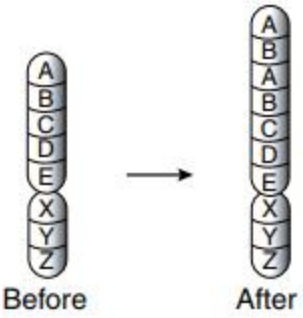
F The white parent carried a dominant allele.
G All the F_1 rabbits carried a recessive allele.
H All the white rabbits are heterozygous.
J All the black rabbits in the F_2 generation are homozygous.

Inversions in chromosomes occur when part of a chromosome breaks out and is reinserted upside down. Which of the diagrams below represents an inversion?

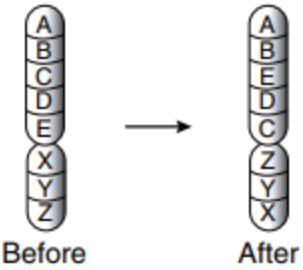
A



B



C



D