

Genetics Test- Mendel, Probability and Heredity

Multiple Choice

Identify the choice that best completes the statement or answers the question.

- _____ 1. In Mendel's experiments, what percentage of the plants in the F_2 generation had a trait that had been absent in the F_1 generation?
- 0%
 - 25%
 - 50%
 - 75%
- _____ 2. Factors that control traits are called
- genes.
 - purebreds.
 - recessives.
 - parents.
- _____ 3. Scientists call an organism that has two different alleles for a trait a
- hybrid.
 - trait.
 - purebred.
 - factor.
- _____ 4. What does the notation TT mean to geneticists?
- two dominant alleles
 - heterozygous alleles
 - a hybrid genotype
 - one dominant and one recessive allele
- _____ 5. What does the notation Tt mean to geneticists?
- two dominant alleles
 - two recessive alleles
 - homozygous alleles
 - one dominant allele and one recessive allele
- _____ 6. What is probability?
- the actual results from a series of events
 - a number that describes how likely it is that an event will occur
 - the way the results of one event affect the next event
 - the number of times a coin lands heads up
- _____ 7. What is the probability of producing a tall pea plant from a genetic cross between two hybrid tall pea plants?
- one in four
 - two in four
 - three in four
 - four in four

- ___ 8. What does a Punnett square show?
- all the possible outcomes of a genetic cross
 - only the dominant alleles in a genetic cross
 - only the recessive alleles in a genetic cross
 - all of Mendel's discoveries about genetic crosses
- ___ 9. If a homozygous black guinea pig (*BB*) is crossed with a homozygous white guinea pig (*bb*), what is the probability that an offspring will have black fur?
- 25 percent
 - 50 percent
 - 75 percent
 - 100 percent
- ___ 10. An organism's physical appearance is its
- genotype.
 - phenotype.
 - codominance.
 - heterozygous.
- ___ 11. A purebred chicken with white feathers is crossed with a purebred chicken that has black feathers. Each of their offspring has both black and white feathers. Why does this happen?
- Both alleles for feather color are dominant.
 - Both alleles for feather color are recessive.
 - The alleles for feather color are neither dominant nor recessive.
 - Several alleles work together to determine the trait.
- ___ 12. Which term refers to physical characteristics that are studied in genetics?
- traits
 - offspring
 - generations
 - hybrids
- ___ 13. The different forms of a gene are called
- alleles.
 - factors.
 - masks.
 - traits.
- ___ 14. An organism's genotype is its
- genetic makeup.
 - physical appearance
- ___ 15. An organism that has two identical alleles for a trait is
- codominant.
 - tall.
 - homozygous.
 - heterozygous.
- ___ 16. A heterozygous organism has
- three different alleles for a trait.
 - two identical alleles for a trait.
 - only one allele for a trait.
 - two different alleles for a trait.

Word Bank

Use the following words to answer questions in the **Modified True/False** and **Completion** sections of the test. Your answers must only come from the word bank. Not all words in the word bank will be used on the test.

Dominant	Allele	Probability	Same
Punnett Square	Hybrid	100	Tall
25	Heterozygous	75	Phenotype
Short	Recessive	d	50
Codominant	D	Genotype	Trait
Different	Homozygous	Gene	Purebred

Modified True/False

Indicate whether the statement is true or false on the line to the left of the question. If false, change the identified word or phrase to make the statement true using only words from the word bank.

- ____ 17. When Mendel crossed purebred short plants with purebred tall plants, all of the offspring were short.

- ____ 18. A purebred white guinea pig and a purebred black guinea pig will only produce hybrid offspring.

- ____ 19. A pea plant that is heterozygous for tall stems has the alleles Tt . _____
- ____ 20. A Punnett square shows all the possible combinations of alleles resulting from a cross.

- ____ 21. An organism's phenotype is its allele combinations. _____

Completion

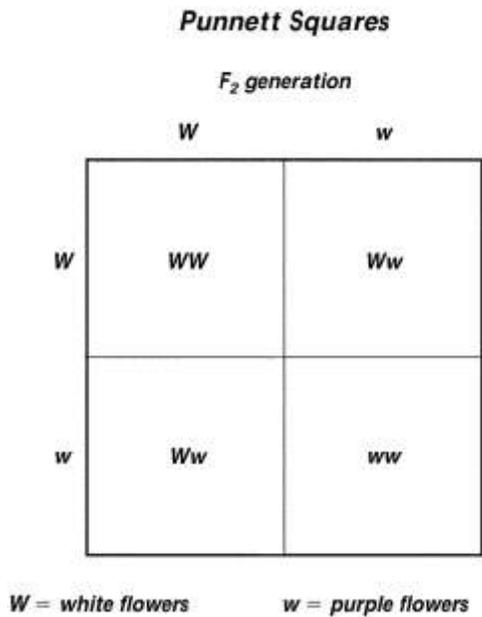
Complete each statement.

22. A(n) _____ organism is the offspring of many generations of organisms that have the same trait.
23. If a(n) _____ allele is present, its trait will appear in the organism.
24. If D represents the dominant allele of a gene, then _____ represents the recessive allele.
25. Mendel used the principles of _____ to predict what percent of offspring would show a particular trait.
26. A chart used to predict results of genetic crosses is known as a(n) _____.
27. In a cross between two hybrid Tt pea plants, _____ percent of the offspring will be Tt .
28. An organism that has two dominant or two recessive alleles is said to be _____ for that trait.

29. Alleles that are neither dominant nor recessive produce an inheritance pattern known as _____.

Short Answer

Use the diagram to answer each question.



30. a) Which trait—white flowers or purple flowers—is controlled by a dominant allele?
- b) How do you know?
31. a) In the F_2 generation, what percent of the offspring have white flowers?
- b) What are the genotype(s) of the white-flowered offspring?

Essay

32. Explain why Mendel's cross of purebred tall and short pea plants resulted in only tall plants.

33. In pea plants, green pod color is controlled by a dominant allele. Yellow is controlled by a recessive allele. Explain why a plant with yellow pods can never be a hybrid.

34. In pea plants, the allele for smooth pods (S) is dominant over the allele for pinched pods (s). Construct a Punnett square that shows a cross between an SS plant and an Ss plant. Predict what percent of the offspring are likely to have smooth pods

