

LSN Chapter 11 Multi-format Test**Modified True/False**

Indicate whether the statement is true or false. If false, change the identified word or phrase to make the statement true.

- _____ 1. The phenotype is the form of a trait that an organism displays. _____
- _____ 2. The form of a gene that is hidden when the dominant allele is present is called recessive.

- _____ 3. When a true-breeding plant self-pollinates, it always produces offspring with different traits as the parent plant. _____
- _____ 4. If an organism has a genotype with a recessive and dominant allele, the dominant trait is always shown.

- _____ 5. Mendel found that the ratio of purple flowers to white flowers was 3:1 in the second generation of offspring.

- _____ 6. Different forms of the same genes are called chromosomes. _____
- _____ 7. Having free earlobes is a dominant trait in humans. Your best friend has free earlobes. From this information you know that his/her genotype for earlobes must be ff. _____
- _____ 8. When a true-breeding purple plant (PP) is crossed with a true-breeding white plant (Pp) the genotype of the offspring must be Pp. _____
- _____ 9. A tabby cat is an example of incomplete dominance. _____
- _____ 10. Inherited traits that are determined by a single gene are called polygenic traits.

Completion

Complete each statement.

Select the correct term to complete each sentence. There are extra terms in the list.

recessive	dominant	phenotype
genotype	percent	chromosomes
alleles	genes	heredity
punnett square	purple	white
cross-pollination	Gregor Mendel	Walter Sutton
Alfred Wegener	self-pollination	yellow
incomplete dominance	codominance	polygenic traits
Yy	YY	yy

11. An organism's _____ is the set of traits it receives from its parents.
12. Individual units called _____ determine an organism's traits.
13. A _____ allele is usually represented by a capital letter.
14. In _____ of flowers, the parts that contain pollen are removed from one plant so it cannot self-pollinate.

15. The works of _____ and _____ have been combined in 5 basic laws of heredity.
16. A yellow seeded pea plant (YY) is crossed with a green seeded (yy) pea plant. The genotype of the first generation of peas is _____.
17. In the gene combination Gg for pod color, g is the _____ allele.
18. A useful tool you can use to show all the possible combinations of alleles from the parents is called a(n) _____.
19. Probability can be expressed as a _____.
20. Genes are located on _____.
21. If a purple flower (Pp) is crossed with another purple flower (PP), the phenotype of the offspring will be colored _____.
22. The _____ for a human with the gene combination (ff) for earlobes is attached earlobes.
23. When the phenotypes of two alleles blend together, it is called _____.

Short Answer

24. White flower color is recessive to purple flower color in pea plants. If a pea plant has white flowers, what is the **genotype** and **phenotype** of the pea plant?
25. What can you predict about the offspring if you know the genotypes of the parents?
26. If a pink flower is crossed with a blue flower, the resulting offspring are pink with blue dots. What is this an example of?
27. Describe the difference between codominance and incomplete dominance. Give 1 example of each.

Problem

In a group of 200 people, 150 have free earlobes and 50 have attached earlobes.

28. What is the ratio of free earlobes to attached earlobes? Show your work.
29. What is the probability that a single person in the group of 200 has an attached earlobe? Show your work.

Essay

30. Describe how Gregor Mendel's ideas contributed to the modern study of genetics and heredity.
31. In your own words, describe the 5 laws of heredity that combine the work of Mendel and Sutton.
32. Describe, using examples, how environmental factors can affect the traits of an organism.

Name: _____

ID: A

Other

33.

	?	?
P	PP	Pp
P	PP	Pp

An offspring has a genotype Pp, and one parent has a genotype pp. Using a punnett square, what is the genotype of the other parent?

34. Using a punnett square, what is the ratio of round seeds (R) to wrinkled seeds (r) when a plant with round seeds (Rr) is crossed with a plant with wrinkled seeds (rr)?

LSN Chapter 11 Multi-format Test Answer Section

MODIFIED TRUE/FALSE

- | | | |
|---|-------------------|-------------------|
| 1. ANS: T
STA: S7L3a | DIF: basic | REF: section 11.1 |
| 2. ANS: T
STA: S7L3a S7L3b | DIF: basic | REF: section 11.1 |
| 3. ANS: F
the same
identical | DIF: basic | REF: section 11.1 |
| 4. ANS: T
STA: S7L3a | DIF: intermediate | REF: section 11.1 |
| 5. ANS: T
STA: S7L3a S7L3c | DIF: intermediate | REF: section 11.1 |
| 6. ANS: F, alleles | DIF: intermediate | REF: section 11.1 |
| 7. ANS: F
Ff
FF | DIF: advanced | REF: section 11.1 |
| 8. ANS: T
STA: S7L3c | DIF: intermediate | REF: section 11.2 |
| 9. ANS: F, codominance | DIF: basic | REF: section 11.3 |
| 10. ANS: F
more than one gene
two or more genes | DIF: intermediate | REF: section 11.3 |

COMPLETION

- | | | | |
|-------------------|------------|-------------------|------------|
| 11. ANS: heredity | DIF: basic | REF: section 11.1 | STA: S7L3c |
| 12. ANS: genes | DIF: basic | REF: section 11.1 | STA: S7L3a |

13. ANS: dominant
DIF: basic REF: section 11.1 STA: S7L3a
14. ANS: cross-pollination
DIF: basic REF: section 11.1 STA: S7L3c
15. ANS:
Gregor Mendel, Walter Sutton
Walter Sutton, Gregor Mendel
DIF: basic REF: section 11.1 | section 11.2 STA: S7L3c
16. ANS: Yy
DIF: intermediate REF: section 11.1 STA: S7L3c
17. ANS: recessive
DIF: intermediate REF: section 11.1 STA: S7L3c
18. ANS: punnett square
DIF: basic REF: section 11.2 STA: S7L3a
19. ANS: percent
DIF: intermediate REF: section 11.2 STA: S7CS3a
20. ANS: chromosomes
DIF: intermediate REF: section 11.2 STA: S7L3a
21. ANS: purple.
DIF: advanced REF: section 11.2 STA: S7L3c
22. ANS: phenotype
DIF: advanced REF: section 11.1 | section 11.2 STA: S7L3c
23. ANS: incomplete dominance
DIF: basic REF: section 11.3 STA: S7L3c

SHORT ANSWER

24. ANS:
Genotype: pp
Phenotype: white flowers
DIF: intermediate REF: section 11.1 STA: S7L3c
25. ANS:
You can predict both the genotype and the phenotype of the offspring.
DIF: basic REF: section 11.2 STA: S7L3c

26. ANS:
codominance

DIF: basic REF: section 11.3 STA: S7L3c

27. ANS:
Codominance is when an organism that has both alleles of a gene displays both phenotypes at the same time. Examples include tabby cats and ABO blood types in humans. Incomplete dominance occurs when the phenotype of the two alleles blend together. An example of this is when red-flowered snapdragons crossed with white-flowered snapdragons create pink-flowered snapdragons.

DIF: intermediate REF: section 11.3 STA: S7L3c

PROBLEM

28. ANS:
$$\frac{150 \text{ people with free earlobes}}{50 \text{ people with attached earlobes}} = \frac{150}{50} = \frac{3}{1}$$

ratio of 3:1

DIF: advanced REF: section 11.1 STA: S7L3c

29. ANS:
$$\text{probability} = \frac{50 \text{ with attached earlobe}}{200 \text{ total in group}} = \frac{50}{200}$$

probability = 0.25 or 25%

DIF: advanced REF: section 11.1 STA: S7L3c

ESSAY

30. ANS:
Mendel studied pea plants and identified several traits that had only two forms. The traits he studied were flower color, seed shape, seed color, and pod color. He was able to prove that all traits do not blend, through cross-breeding plants with different forms of the same trait. His main conclusion was that traits must be determined by individual units, which we call genes today. He was also able to conclude that there were two forms of the same gene, which scientists call alleles today. He was also able to describe that alleles often come in dominant and recessive pairs, with the dominant trait always showing when it is present in the pair. In conclusion, Mendel is referred to as the “Father of Genetics”.

DIF: basic REF: section 11.1 STA: S7L3c

31. ANS:

The 5 laws that Mendel and Sutton's work combined to form are as follows:

- 1) Individual units called genes determine an organism's traits.
- 2) A gene is a segment of DNA located on chromosomes that carries heredity instructions from parent to offspring.
- 3) For each gene, an organism typically receives one allele from each parent.
- 4) If an organism inherits different alleles for a trait, one allele may be dominant over the other.
- 5) The alleles of a gene separate from each other when sex cells are formed during meiosis.

DIF: intermediate REF: section 11.2 STA: S7L3a | S7L3c

32. ANS:

Where an organism lives, what it eats, how it reproduces, and its position in the food chain are all environmental factors that can affect its traits. Although traits are inherited, their expression can be modified by interactions with the environment. Examples include: temperature affecting the development of turtle embryos, with higher temperatures favoring the production of males. Although human height is determined by genes, nutrition also affects a person's height.

DIF: advanced REF: section 11.3 STA: S7L3c

OTHER

33. ANS:

Pp

DIF: intermediate REF: section 11.2

34. ANS:

	r	r
R	Rr	Rr
r	r	r

The punnett square shows that 2 seeds will be round (rr) and 2 seeds will be wrinkled (Rr).
The ratio of round to wrinkled seeds is 1:1

DIF: advanced REF: section 11.2