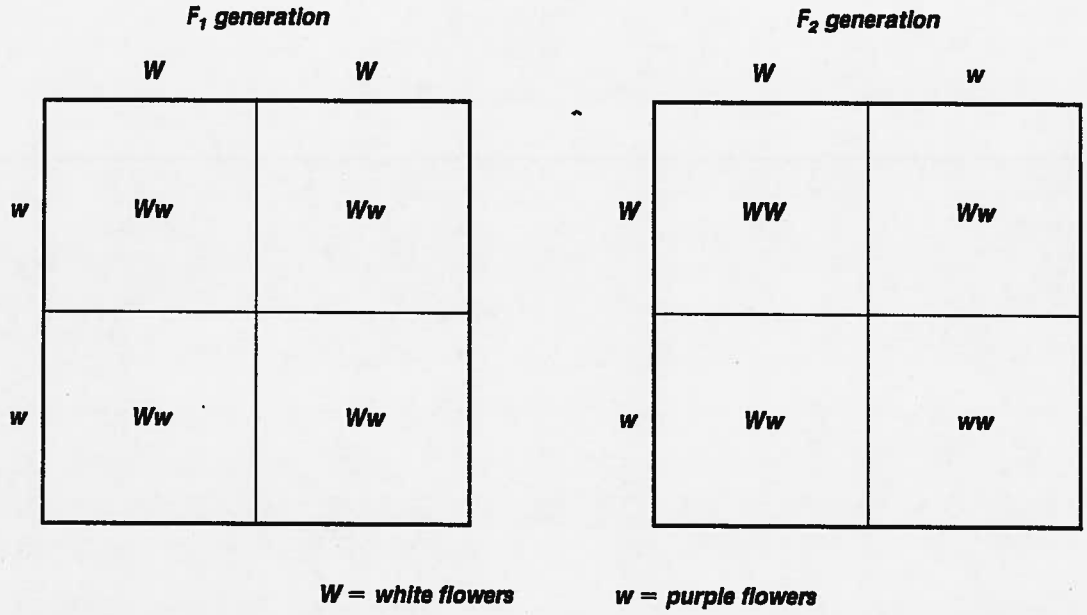
Name: _____ Class: _____ Date: _____ ID: B

Study Guide Chapter 4

Short Answer

Use the diagram to answer each question.

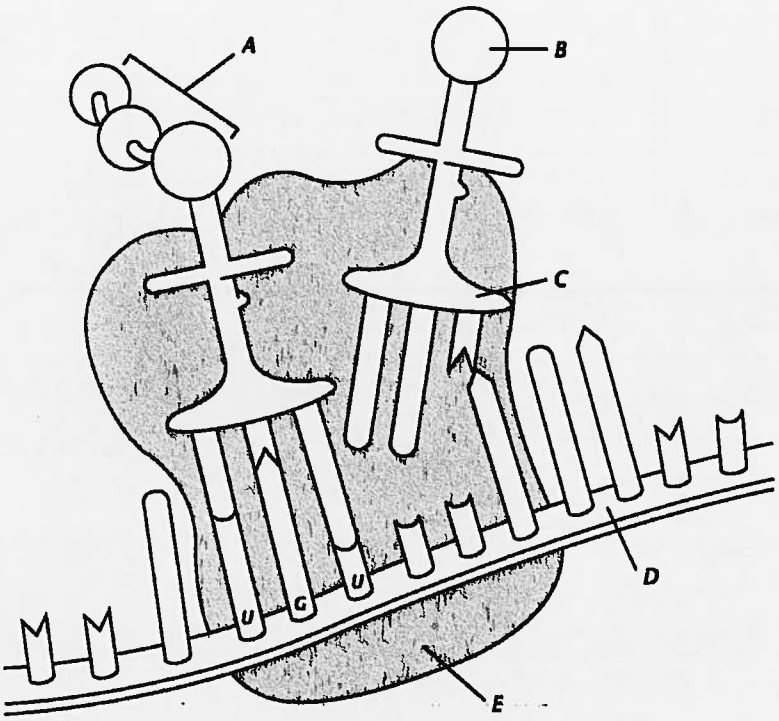
Punnett Squares



1. Suppose one of the parents of the F_2 generation had been *ww* instead of *Ww*. What percent of the offspring would have purple flowers? What percent would have white flowers?
2. Which trait—white flowers or purple flowers—is controlled by a dominant allele? Which is controlled by a recessive allele? How do you know?
3. In which generation are the parents purebred? In which generation are they hybrids?
4. In the F_2 generation, what percent of the offspring have purple flowers? What is the genotype of the purple-flowered offspring?
5. In the F_2 generation, what percent of the offspring have white flowers? What are the genotypes of the white-flowered offspring?
6. In the F_1 generation, what is the genotype of the offspring? What is their phenotype?

Use the diagram to answer each question.

Protein Synthesis



7. Identify structure D and state where it is made.
8. What are the three nitrogen bases in transfer RNA that pair with bases A-G-U in messenger RNA?
9. Identify structures B and C.
10. Identify structure A and state what it is made of.
11. Identify structure E and describe its function.

Multiple Choice

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

____ 12. What do transfer RNA molecules do during protein synthesis?
   a. carry amino acids and add them to the growing protein
   b. copy the coded message from the DNA and carry it into the cytoplasm
   c. copy the coded message from the protein and carry it into the nucleus
   d. copy the coded message from the DNA and carry it into the nucleus

____ 13. A heterozygous organism has
   a. only one allele for a trait.
   b. two identical alleles for a trait.
   c. two different alleles for a trait.
   d. three different alleles for a trait.

____ 14. What is probability?
a. a number that describes how likely it is that an event will occur
b. the way the results of one event affect the next event
c. the number of times a coin lands heads up
d. the actual results from a series of events

____ 15. An organism's genotype is its
a. feather color.
b. stem height.
c. genetic makeup.
d. physical appearance.

____ 16. An organism's physical appearance is its
a. genotype.
b. heterozygous.
c. codominance.
d. phenotype.

____ 17. What does messenger RNA do during protein synthesis?
a. copies the coded message from the DNA and carries it into the cytoplasm
b. carries amino acids and adds them to the growing protein
c. copies the coded message from the protein and carries it into the nucleus
d. copies the coded message from the DNA and carries it into the nucleus

____ 18. What is the chromosome theory of inheritance?
a. Codominant genes combine to form new hybrids.
b. Hybrid pairs of chromosomes combine to form offspring.
c. Chromosomes are carried from parents to offspring on hybrids.
d. Genes are carried from parents to offspring on chromosomes.

____ 19. What did Gregor Mendel do to study different characteristics in his genetics experiments?
a. He cross-pollinated both plants and animals.
b. He cross-pollinated plants.
c. He studied only asexual plants.
d. He studied only tall and short pea plants.

____ 20. What does the notation *Tt* mean to geneticists?
a. two recessive alleles
b. one dominant allele and one recessive allele
c. two dominant alleles
d. homozygous alleles

____ 21. What does a Punnett square show?
a. only the recessive alleles in a genetic cross
b. only the dominant alleles in a genetic cross
c. all of Mendel's discoveries about genetic crosses
d. all the possible outcomes of a genetic cross

____ 22. An organism that has two identical alleles for a trait is
a. tall.
b. heterozygous.
c. homozygous.
d. codominant.

____ 23. Which term refers to physical characteristics that are studied in genetics?
a. hybrids
b. traits
c. offspring
d. generations

____ 24. What is a mutation?
a. any change that is helpful to an organism
b. any change in the phenotype of a cell
c. any change in a gene or chromosome
d. any change that is harmful to an organism

____ 25. Factors that control traits are called
a. recessives.
b. genes.
c. purebreds.
d. parents.

____ 26. When sex cells combine to produce offspring, each sex cell will contribute
a. twice the number of chromosomes in body cells.
b. the normal number of chromosomes in body cells.
c. one fourth the number of chromosomes in body cells.
d. half the number of chromosomes in body cells.

____ 27. What does the notation *TT* mean to geneticists?
a. at least one dominant allele
b. two dominant alleles
c. one dominant and one recessive allele
d. heterozygous alleles

____ 28. Scientists call an organism that has two different alleles for a trait a
a. purebred.
b. hybrid.
c. factor.
d. trait.

____ 29. The different forms of a gene are called
a. factors.
b. masks.
c. traits.
d. alleles.

____ 30. Where does protein synthesis take place?
a. in the ribosomes in the nucleus of the cell
b. on the chromosomes in the cytoplasm of the cell
c. on the ribosomes in the cytoplasm of the cell
d. in the chromosomes in the nucleus of the cell

____ 31. What is the probability of producing a tall pea plant from a genetic cross between two hybrid tall pea plants?
a. two in four
b. one in four
c. three in four
d. four in four

____ 32. What happens during meiosis?
a. Each sex cell copies itself to form four new chromosomes.
b. Chromosome pairs separate and are distributed into new sex cells.
c. Chromosome pairs remain together when new sex cells are formed.
d. Two sex cells combine.

____ 33. Which nitrogen base in RNA is NOT part of DNA?
a. cytosine
b. uracil
c. guanine
d. adenine