Name _____ Class _____ Date _____

Skills Worksheet

Directed Reading

Section: Mendel's Theory

In the space provided, write the letter of the description that best matches the term or phrase.

_____ 1. alleles

_____ 2. dominant

_____ 3. recessive

_____ 4. homozygous

_____ 5. heterozygous

_____ 6. genotype

_____ 7. phenotype

a. when two different alleles are present, the allele that is completely expressed

b. when two alleles of a particular gene are the same

c. when two alleles of a particular gene are different

d. an organism's physical appearance

e. the set of alleles that an organism has

f. different versions of a gene

g. when two different alleles are present, the allele that has no observable effect on the organism's appearance

Complete each statement by writing the correct term or phrase in the space provided.

8. If the allele for yellow peas is *Y*, the allele for the contrasting trait, green peas, is _____ .

9. If *Tt* is the genotype of a plant, where *T* stands for tall and the recessive allele stands for short, its phenotype is _____ .

10. If *tt* is the genotype of a plant, where *T* stands for tall and the recessive allele stands for short, its phenotype is _____ .

Read each question, and write your answer in the space provided.

11. What is the law of segregation?

_____

_____

_____

12. What is the law of independent assortment?

_____

_____

_____

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Skills Worksheet

Active Reading

Section: The Origins of Genetics

Read the passage below. Then answer the questions that follow.

Mendel's initial experiments were monohybrid crosses. A **monohybrid cross** is a cross that involves one pair of contrasting traits. For example, crossing a plant with purple flowers and a plant with white flowers is a monohybrid cross. Mendel carried out his experiments in three steps.

Step 1: Mendel allowed each variety of garden pea plants to self-pollinate for several generations. This method ensured that each variety was **true-breeding** for a particular trait; that is, all the offspring would display only one form of a particular trait. For example, a true-breeding purple-flowering plant should produce only plants with purple flowers in subsequent generations.

These true-breeding plants served as the parental generation in Mendel's experiments. The parental generation, or **P generation,** are the first two individuals that are crossed in a breeding experiment.

Step 2: Mendel then cross-pollinated two P generation plants that had contrasting forms of a trait such as purple and white flowers. Mendel called the offspring of the P generation the first filial generation, or **F_1 generation.** He then examined each F_1 plant and recorded the number of F_1 plants expressing each trait.

Step 3: Finally, Mendel allowed the F_1 generation to self-pollinate. He called the offspring of the F_1 generation plants the second filial generation, or **F_2 generation.** Again, each F_2 plant was characterized and counted.

SKILL: READING EFFECTIVELY

Read each question, and write your answer in the space provided.

1. The prefix *mono-* means "one." How does this apply to the key term *monohybrid cross*?

_____

_____

2. What information does the third sentence tell the reader?

_____

_____

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Active Reading *continued*

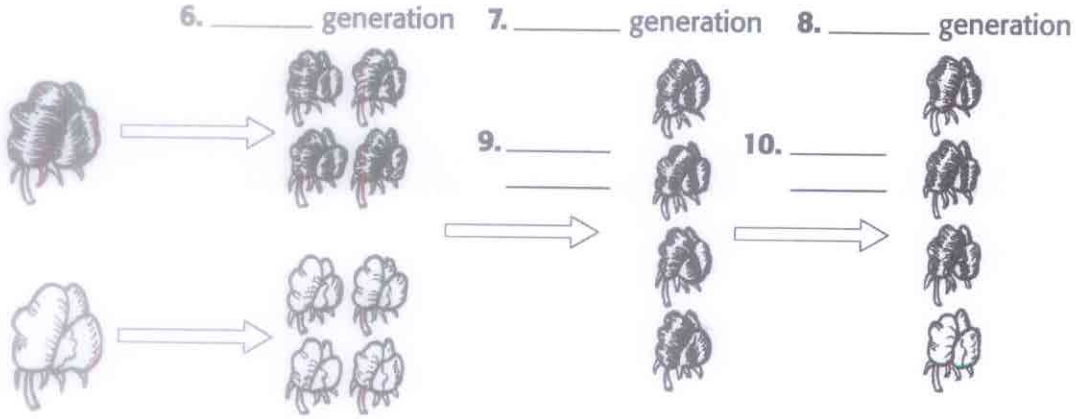
3. Describe the offspring of a true-breeding white-flowering plant.

4. What is the P generation?

5. What does the term *F_1 generation* refer to?

SKILL: INTERPRETING GRAPHICS

The figure below shows three generations of plants. Insert the following labels in the spaces provided: cross-pollination, F_1, F_2, P, self-pollination.



In the space provided, write the letter of the phrase that best completes the statement.

_____ 11. During the course of his experiment, Mendel studied traits in
- a. one generation of plants.
- b. two generations of plants.
- c. three generations of plants.
- d. more than five generations of plants.

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Skills Worksheet

Active Reading

Section: Mendel's Theory

Read the passage below. Then answer the questions that follow.

Geneticists have developed specific terms and ways of representing an individual's genetic makeup. Letters are often used to represent alleles. Dominant alleles are indicated by writing the first letter of the trait as a capital letter. Recessive alleles are also indicated by writing the first letter of the dominant trait, but the letter is lowercase.

If two alleles of a particular gene present in an individual are the same, the individual is said to be **homozygous** for that trait. If the alleles of a particular gene present in an individual are different, the individual is **heterozygous** for that trait.

SKILL: READING EFFECTIVELY

Read each question, and write your answer in the space provided.

1. How are dominant alleles often represented?

_____

_____

2. How are recessive alleles often represented?

_____

_____

3. A particular plant is said to be homozygous for seed color. What does this mean?

_____

_____

4. Another plant is said to be heterozygous for flower color. What does this mean?

_____

_____

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Active Reading *continued*

5. The allele for yellow peas is dominant to the allele for green peas. How would you represent the alleles of a plant that is heterozygous for seed color?

_____

_____

6. The allele for purple flowers is dominant to the allele for white flowers. How would you represent the alleles of a plant that is homozygous recessive for flower color?

_____

_____

7. How would you represent the alleles of a plant that is heterozygous for flower color?

_____

_____

In the space provided, write the letter of the phrase that best completes the statement.

_____ 8. A plant with YY alleles for seed color is
- a. heterozygous dominant for this trait.
- b. homozygous dominant for this trait.
- c. homozygous recessive for this trait.
- d. Either (a) or (b)