

Chapter 3 Section 1 Cells Heredity & Classification /22

Section: Mendel and His Peas

1. What is heredity?

2. Give one example of something about yourself that has to do with heredity.

WHO WAS GREGOR MENDEL?

- _____ 3. Gregor Mendel was born in
- a. the United States.
 - b. Austria.
 - c. Germany.
 - d. Italy.

- _____ 4. Gregor Mendel did his research
- a. in a laboratory.
 - b. at a university.
 - c. at a monastery.
 - d. on a farm.

UNRAVELING THE MYSTERY

- _____ 5. In Mendel's work, first and second generation mean
- a. parents and offspring.
 - b. plants and animals.
 - c. peas and peapods.
 - d. one kind of organism.

6. Both male and female reproductive structures are found in _____ plants.

7. The offspring of _____ plants all have the same traits as the parent.

8. Because pea plants can _____, one plant is able to fertilize another.

Directed Reading A *continued*

9. List two ways that a plant can cross-pollinate.

(2pts)

10. What happens if a true breeding plant self pollinates?

11. In a population, a(n) _____ is a feature that has different forms.

12. Different forms of characteristics are called _____.

13. If a plant cross pollinates, how many parents does it have?

14. How did Mendel make sure that some plants cross-pollinated?

Directed Reading A *continued*

MENDEL'S FIRST EXPERIMENTS

Match the correct definition with the correct term. Write the letter in the space provided.

- | | |
|--|-----------------------------------|
| _____ 15. seen in the second generation | a. dominant trait |
| _____ 16. offspring from the first cross | b. first-generation plants |
| _____ 17. seen in the first generation | c. recessive trait |

MENDEL'S SECOND EXPERIMENTS

- _____ 18. What results did Mendel get when he allowed the first-generation plants to self-pollinate?
- a.** half purple and half white offspring
 - b.** every fourth plant had white flowers
 - c.** every fourth plant had purple flowers
 - d.** offspring with all purple flowers
- _____ 19. When a relationship between two different things is shown in a fraction, it is
- a.** a ratio.
 - b.** a problem.
 - c.** a dominant trait
 - d.** a recessive trait.
- _____ 20. Gregor Mendel realized the only explanation for his results was that
- a.** the traits were appearing at random.
 - b.** the male traits were always the dominant ones.
 - c.** each trait had two sets of instructions, one from each parent.
 - d.** his important research would open the door to modern genetics.
- _____ 21. Mendel was recognized for his discovery
- a.** five years after he finished his work.
 - b.** in 1865 when he published his work.
 - c.** about ten years ago.
 - d.** more than 30 years later.

Chapter 3 Section 2 Cells Heredity & Classification**/25****Section: Traits and Inheritance**

- _____ 1. What ratio did Mendel find for dominant to recessive traits?
- a. 1 to 1
 - b. 2 to 1
 - c. 3 to 1
 - d. 4 to 1

A GREAT IDEA

- _____ 2. What are the instructions for an inherited trait?
- a. alleles
 - b. phenotype
 - c. albinism
 - d. genes
- _____ 3. Two forms of a gene, one from each parent, are called
- a. alleles.
 - b. phenotypes.
 - c. albinism.
 - d. genes.
- _____ 4. When gene pairs are written, the dominant allele has a(n)
- a. D in front of it.
 - b. capital letter.
 - c. bold letter.
 - d. underlined letter.
- _____ 5. The genotype Pp can also be written
- a. *pP*
 - b. *pp*
 - c. *PP*
 - d. *Ppp*
- _____ 6. When purple is dominant, the white offspring of purple and white parents will be
- a. *pP*
 - b. *pp*
 - c. *PP*
 - d. *Ppp*

Directed Reading A *continued*

Match the correct description with the correct term. Write the letter in the space provided.

- | | |
|---|---|
| <p>_____ 7. used to organize possible offspring combinations</p> <p>_____ 8. an organism's appearance</p> <p>_____ 9. a plant with one dominant and one recessive gene</p> <p>_____ 10. condition that causes colorless hair, skin, and eyes</p> <p>_____ 11. a plant with either two dominant or two recessive genes</p> <p>_____ 12. genetic makeup formed from both inherited alleles together</p> <p>_____ 13. instructions for traits passed to offspring from parents</p> | <p>a. phenotype</p> <p>b. heterozygous</p> <p>c. genotype</p> <p>d. homozygous</p> <p>e. genes</p> <p>f. albinism</p> <p>g. Punnett square</p> |
|---|---|

	<i>p</i>	<i>p</i>
<i>P</i>	<i>Pp</i>	<i>Pp</i>
<i>P</i>	<i>Pp</i>	<i>Pp</i>

	<i>P</i>	<i>p</i>
<i>P</i>	<i>PP</i>	<i>Pp</i>
<i>p</i>	<i>pP</i>	<i>pp</i>

14. Look at the Punnett square on the left. What genotype do the offspring have?

15. Look at the Punnett square on the left. What will happen to the recessive allele?

(2pts)

16. Look at the Punnett square on the right. Which genotypes contain a dominant allele?

17. Look at the Punnett square on the right. Which two genotypes are exactly the same?

Directed Reading A *continued*

WHAT ARE THE CHANCES?

_____ 18. The mathematical chance that something can happen is called

- a. genotype.
- b. albinism.
- c. probability.
- d. trait.

19. What is the probability of inheriting two *p* alleles?

20. Why are the traits that Mendel studied in pea plants easy to predict?

MORE ABOUT TRAITS

21. When each allele has its own degree of influence, it is known as

22. How is a snapdragon an example of incomplete dominance?

23. Sometimes one gene can influence more than one _____.

24. Besides genes, what else can have an influence on traits?

Chapter 3 Section 3 Cells Heredity & Classification**/39****Section: Meiosis**

- _____ 1. What are two kinds of reproduction?
- chromosomes and offspring
 - heredity and genes
 - asexual and sexual
 - mothers and fathers

ASEXUAL REPRODUCTION

- _____ 2. What is the name for the way cells divide in asexual reproduction?
- twins
 - mitosis
 - meiosis
 - homologous
3. How many parent cells are needed in asexual reproduction?
- _____

SEXUAL REPRODUCTION

- _____ 4. When two parent cells join together to form offspring, it is called
- asexual reproduction.
 - mitosis.
 - sexual reproduction
 - meiosis.
- _____ 5. Parent cells are called
- sex cells.
 - body cells.
 - homologous cells.
 - allele cells.
- _____ 6. Chromosomes that carry the same sets of genes are called
- twin chromosomes.
 - homologous chromosomes.
 - ordinary chromosomes.
 - asexual chromosomes.
- _____ 7. How do sex cells differ from other human cells?
- Sex cells have more chromosomes.
 - Sex cells have half as many chromosomes.
 - Sex cells are larger.
 - Sex cells have 46 pairs of chromosomes.

Directed Reading A *continued*

8. Sex cells are made during a process called _____.
9. In humans, when a new cell is formed from a sperm cell and an egg cell, how many chromosomes does it have?

10. Walter Sutton's important observation was that chromosomes of the eggs and sperm cells are located inside the _____.

11. Sutton proposed that _____ are located on chromosomes.

12. When a sex cell goes through meiosis, how many chromosomes does it end up with?

THE STEPS OF MEIOSIS

Match the correct definition with the correct term. Write the letter in the space provided.

- | | |
|--|------------------|
| 13. how chromosomes look before meiosis | a. chromatid |
| 14. exact duplicate of a chromosome | b. cell membrane |
| 15. forms around each new cell during meiosis | c. threadlike |
| 16. process in which the nucleus divides only once | d. mitosis |

Put the eight steps of meiosis in order from first to last. Write the appropriate number in the space provided.

- _____ 17. The chromosomes separate from their partners and move to opposite ends of the cell.
- _____ 18. The chromosomes are not copied again between the two cell divisions.
- _____ 19. Four new cells have formed from the original single cell.
- _____ 20. Each chromosome makes an exact copy of itself.
- _____ 21. The chromatids pull apart, and the cells divide.
- _____ 22. The nuclear membrane re-forms, and the cell divides.
- _____ 23. The chromosomes line up at the equator of each cell.
- _____ 24. Similar chromosomes pair with one another.

Directed Reading A *continued*

25. After meiosis, how many chromosomes does each new cell have?

MEIOSIS AND MENDEL

26. The steps in _____ explain Mendel's results.

27. When two true-breeding plants are crossed, only one

_____ is possible.

28. The genes that determine sex are found on the _____.

29. In humans, what kind of sex chromosomes do females have?

30. In humans, what kind of sex chromosomes do males have?

31. Which chromosome from the sperm is necessary to produce a female?

32. Which chromosome from the sperm is necessary to produce a male?

33. Because males have only one *X* chromosome, what is more likely to happen to them?

34. Name two sex-linked disorders.

(2pts)

35. To trace a trait through generations of a family, you can use

a(n) _____.

36. A genetic counselor can often predict if a person is

a(n) _____ of hereditary diseases.

37. People with cystic fibrosis have two _____ alleles.

38. When organisms with desirable characteristics are mated by humans, it is

called _____.

Vocabulary Activity

Vocabulary Garden

After you finish reading the chapter, give this puzzle a try! Write the word or phrase being described below in the appropriate space on the next page.

1. chromosomes with matching information
2. carry genes that determine the sex of offspring
3. the two genes that govern the same characteristic
4. an organism's inherited combination of alleles
5. nuclear division in eukaryotic cells in which each cell receives a copy of the original chromosomes
6. the passing of traits from parents to offspring
7. cell division that produces sex cell
8. kind of trait that seemed to vanish in the offspring produced in Mendel's first experiment
9. tool used to visualize all the possible combinations of alleles from parents
10. kind of trait that always appeared in the offspring produced in Mendel's first experiment
11. A true-_____ plant always produces offspring with the same trait as the parent(s).
12. A self-_____ plant contains both male and female reproductive structures.
13. male sex cells
14. an organism's inherited appearance
15. a tool for tracing a trait through generations of a family
16. the mathematical chance that an event will occur
17. located on chromosomes and carry hereditary instructions

Vocabulary Activity *continued*

1. _____
1
2. _____
2
3. _____
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4. _____
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5. _____
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6. _____
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7. _____
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8. _____
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9. _____
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10. _____
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11. _____
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12. _____
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13. _____
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14. _____
14
15. _____
15
16. _____
16
17. _____
17

Using the numbered letters above, fill in the spaces below to find a phrase related to heredity.

(2pts)

_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
1	2	3	4	5	6	7	8	9	10	11	12	13
_____	_____	_____	_____									
14	15	16	17									